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This Issue in the Journal

Pacific Islands Families Study: depressive symptoms in 9-year-old Pacific children living in New Zealand

Janis Paterson, Leon Lusitini, Steve Taylor

This study investigated associations between individual, maternal, cultural and sociodemographic variables with symptoms of child depression in 9-year-old Pacific children living in New Zealand. At approximately 9 years of age, child self-reports (n=858) of depressive symptoms were gathered. We found that being a victim or perpetrator of bullying, previous internalising behaviour problems and low maternal education were significantly associated with high child depression scores. Low depression scores were associated with children's positive perception of self, physical abilities, parental and peer relationships, high verbal intelligence, and high performance at school. These findings indicate that building up child self-esteem and supportive relationships around the child are likely to reduce the risk of depression and these strengths may mitigate against bullying involvement.

Changes in the provision of transient ischaemic attack services in New Zealand 2008 to 2013

Wallace Brownlee, Annamarei Ranta, Julius Dale-Gandar, Patricia Bennett, John Gommans, John Fink, P Alan Barber

Stroke is a major cause of death and disability in New Zealand. A transient ischaemic attack or TIA occurs when there are temporary symptoms of a stroke that improve on their own but may be a sign that a stroke is going to occur in the next few days. People with a TIA need prompt assessment and treatment in order to prevent a stroke occurring. We conducted a survey of TIA services in 2008 and found there were unacceptable delays in the assessment and management of patients with TIA in New Zealand hospitals. We repeated the survey in 2013 and found that in many areas there has been significant improvement over the last 5 years. However, there are still areas where improvement is needed and district health boards (DHBs) need to consider adequately resources TIA services as a high priority in order to reduce the rates of death and disability from stroke in New Zealand.

Sex workers' utilisation of health services in a decriminalised environment

Gillian Abel

Sex work was decriminalised in New Zealand in 2003. Prior to this, most sex workers reported having regular sexual health check-ups and most attended their general practitioner for this, followed by a local Sexual Health Clinic and then New Zealand Prostitutes' Collective's (NZPC) weekly sexual health clinic. There has been little change since decriminalisation. Most sex workers do not disclose their occupation to health workers because of perceptions of the stigma attached to their occupation. This has implications for the thoroughness of the check-up. It would seem that encouraging attendance at the NZPC clinic would be beneficial as then disclosure would not be an issue. However, these clinics are not available outside of Christchurch, Wellington and Auckland and are only run on a once a week basis in Christchurch and Auckland and twice a week in Wellington.

Outcomes in HrHPV-positive women with low grade cervical smears and normal or low grade initial colposcopy results

Erica Winsley, Dushyant Maharaj, Peter Abels, Diane Kenwright, Fali Langdana

Genital human papillomavirus (HPV) infection is the most commonly diagnosed sexually transmitted infection in New Zealand. HPV infection is a prerequisite for the development of cervical cancer. For a woman with cervical smear abnormality and a high-risk type HPV (HrHPV) test, management must balance the need to identify and treat abnormalities likely to progress to cancer and avoid unnecessary treatment related to transient HPV infection. Women 30 years and older who are HrHPV-positive and have either normal or low grade abnormalities at colposcopic biopsy may be followed up with a 12-month cervical smear rather than a repeat colposcopy. Women with a normal smear and HrHPV-positive test should undergo a repeat co-test in 12 months, and if the co-test is positive should be referred for colposcopy.

Using triggers in primary care patient records to flag increased adverse event risk and measure patient safety at clinic level

Kyle S Eggleton, Susan M Dovey

This paper looked at how much harm occurs in general practice and developed a tool, called a 'Trigger Tool', which could assist primary care in measuring harm. According to the findings harm occurs in about 7% of consultations, although it possibly could be higher, and is predominately due to side effects of medication. The tool that was developed identifies warnings events (triggers) that general practice teams can investigate to see if harm has occurred. The tool is very good at picking up the majority of harm that occurs in general practice and not as good at excluding events in which harm did not occur.

Work status and disability trajectories over 12 months after injury among workers in New Zealand

John Langley, Rebecca Lilley, Ari Samaranayaka, Sarah Derrett

Return to work (RTW) is often used as a measure of outcome and scheme performance by injury compensation insurers (e.g. ACC and work-based injury insurance schemes overseas). While RTW is an undeniably important outcome for workers and insurers alike, findings from the Prospective Outcomes of Injury Study (POIS) suggest that RTW is an insufficient measure of outcome when considered in isolation from disability. For example POIS analyses of RTW over 1 year for 1975 injured ACC claimants (who had been in paid employment at the time of their injury) found that of those who were not working at both 3 and 12-months post-injury, only 20% reported no (considerable) disability at either time point. In contrast, of those who were in paid work by 3-months post-injury 68% reported no (considerable) disability at either 3 or 12 months post-injury. There poor concordance between RTW and disability outcomes. RTW is one performance measure of outcome following injury, but it does not adequately reflect outcomes of importance to individuals, their families and wider society such as disability.

Depression and bullying in children

Stephanie Moor, Sally N Merry

The importance of depression in children and adolescents, and the potential negative long-term sequelae are increasingly recognised. The article by Paterson et al¹ in this issue of the *Journal* provides some insights into depression in children aged 9 years in the ongoing Pacific Island Families Study.

This study is the first large prospective longitudinal study of Pacific Island families born in Auckland, New Zealand and has as its aim to inform health intervention strategies for the Pacific Island population. These 1398 children and 1376 mothers have been followed up at 6 weeks (baseline), 1, 2, 4, 6 and 9 years.

At this 9-year wave they report on a wide range of child and parent outcomes including maternal reports on their child's behaviour, maternal mental health including depression, partner violence, recent stressful life events, and parental alcohol and tobacco use.

The children (858 children; 61% of the sample) were given a developmentally appropriate self-report screening questionnaire on depression. Information on bullying (both as perpetrator and victim) behaviour, involvement with gangs (e.g. hanging out, wearing gang colours, representing a gang in fights), the children's perceptions of their physical abilities, relationships with peers and family, general self-perception and school performance and teacher ratings of school performance and a standard global assessment of cognitive development were also collected. The associations of these factors with childhood depression were then investigated.

Their main finding was that children involved in bullying, either as a victim or perpetrator, reported significantly higher levels of depressive symptoms than those not involved in bullying. The relationship between bullying and depression is complex but there is evidence from another internationally important and ongoing longitudinal study, the Christchurch Health and Development Study (CHDS), about long-term effects of bullying.

The CHDS showed that if a parent or teacher reported that a child was a bully in middle childhood (ages 7 to 12) then as an adolescent and adult, they were at some risk (adjusted mean OR 1.3) of a range of mental health problems including depression.² Moreover, parental reports of their child being a victim of bullying in early teen years in this study were associated with a range of mental health problems including depression and suicidality over adolescence and adulthood.

The adverse effects of both bullying perpetration and victimisation have attracted increased public attention and concern over recent years. The recent youth 2012 survey gives some insight into current bullying in New Zealand schools.³ This nationally representative study on high school students in 2001, 2007 and now 2012 reported that there was little change in the proportion of students being bullied at school with around 7% of boys and 5% of girls reporting that they were bullied

weekly or more often and 9% of students said they had been afraid that someone at school would hurt or bother them in the past year. Both of these figures were higher among younger students and bullying became less of a problem as students got older.

School-based interventions tackling bullying in schools have been shown to improve not only the emotional, physical and social health of victims⁴ but also to have economic advantages with increased school attendance and attainment leading to better long term employment and earnings.

Economic models show that each dollar invested in school-based interventions to reduce bullying result in \$14 of net savings.⁵ Finland has implemented a nationwide programme in schools (the KiVa programme) with early results suggesting that if generalised to the Finnish population of 500,000 students there would be a reduction of 7500 bullied and 12,500 victims.⁶

Depression in the pre-pubertal period is uncommon (prevalence rates of 1–3%)⁷ and affects boys and girls equally so that the prevalence of depression reported in Pacific children at 7% is relatively high. The prevalence of depression rises significantly through adolescence to that of adult rates with a strong female preponderance (2:1) emerging after puberty.

Although depression runs in families, with offspring of parents with depression having 3–4 times the rates of depression as non-depressed parents, inherited factors only partially account for this. Indeed twin studies have shown that child onset depression has very low rates of heritability compared with the modest heritability (30–50%) of depression that has a late adolescent onset.⁸

It is thought that depression in children often reflects stress within the family. Inherited factors appear to increase the risk indirectly through gene-environment interplay by a combination of increasing exposure to risky environments and by increasing the sensitivity of the brain to that risk through brain and neuroendocrine mechanisms. In this way, the risk of maternal (and probably paternal) depression are mediated through exposure to the environment that the depressed adult caregivers create around them.

This environment may contain not only the exposure to the symptoms of depression in the adult, but also an increase in adverse chronic stressors, particularly those that affect relationships in the family and with peers such as bullying.

Thus child onset depression is more strongly associated with family adversity, parental neglect and peer relationship problems. It is surprising then that in this study there was no association between child-reported depressive symptoms and maternal depression, stressful life events and family instability.

There was also no association with socioeconomic factors with the exception of low maternal education, a well-known risk factor associated with a number of adverse child physical and mental health outcomes. Perhaps the low prevalence of parent self-reported depression may partially explain this.

Children noted by their parents to have a range of internalising symptoms when they were aged 6 were also more likely to have depressive symptoms at aged 9, confirming the stability of these disorders in childhood.

The Dunedin longitudinal study also looked at depression in their cohort of around 1000 (mainly Pakeha/New Zealand European) children at age 9 years born 40 years ago. They found that although parent reports overestimated depressive symptoms, parents were better than teachers in picking up on the irritable, non-compliant behaviour and somatic symptoms of their depressed children who had been identified by interview by a psychiatrist.

They also found that depressed children had low self-perception but no evidence of cognitive impairment.⁹ Both the Dunedin study and CHDS have clearly shown that early onset emotional and behavioural problems persist and are related to a wide range of later adverse outcomes.¹⁰ These problems simply do not go away and point to a need for active intervention with this group of children.

Pacific children at the other end of the spectrum with low levels of depressive symptoms had a range of protective factors including positive perception about themselves and their important relationships, and better scholastic performance. The importance of positive relationships in families and at school is once again underlined, in line with findings from other studies such as the series of Youth 2000 surveys.

Longitudinal studies provide unique and important information on the trajectory of important determinants of health and wellbeing. This study, focusing on particular issues for Pacific children and their families, is a welcome addition to the suite of excellent longitudinal studies we have in New Zealand.

Competing interests: Nil.

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Management of transient ischaemic attack: the importance of time and specialised clinics

Graeme D Hammond-Tooke

“Time is brain” is the mantra associated with stroke management in the 21st Century. This is because stroke treatments that actually work are now available, chiefly aspirin and thrombolysis. The message is that stroke is a medical emergency, usually requiring acute admission to hospital. But there is a limit to what can be achieved once stroke has taken place. So much better to prevent stroke before it happens.

Good management of transient ischaemic attack (TIA), the harbinger of stroke, is crucial. The risk of a stroke within 90 days ranges from 9 to 17%, with the risk in the first 48 hours as high as 10%.¹ Management of TIA depends on the underlying aetiology, but for most TIAs there are effective strategies: management of treatable risk factors, (especially hypertension), antiplatelet agents, statins, endarterectomy for carotid stenosis and anticoagulation for atrial fibrillation. None of these are effective if a stroke occurs before treatment starts. Thus it is important that not only stroke, but TIA is managed in a prompt and efficient way.

One difference between stroke and TIA is that many stroke victims need hospital care by virtue of their neurological deficits and the need to be nursed. In contrast, TIA should theoretically be manageable in an ambulatory setting. The problem with this is that obtaining investigations quickly can be difficult. Radiology services are under pressure, and sometimes it is necessary to admit patients to coordinate the investigations in a timely fashion. In the case of TIA, investigations usually include brain imaging (either computerised tomography or magnetic resonance imaging), diagnostic ultrasound of the carotids, electrocardiography and echocardiography.

Admission of TIA patients to facilitate these investigations is enormously expensive and not really affordable. That is why TIA clinics are important. In the current issue of the *NZMJ*, Brownlee et al report improvement in the availability of TIA clinics in New Zealand, together with improvements in other stroke management parameters such as waiting times for imaging and carotid endarterectomy.²

TIA clinics facilitate investigation and treatment of TIAs in a cost-effective way, that is probably just as safe as inpatient investigation.^{3,4} They are cost-effective because the alternative is hospital admission or, if stroke is not prevented, a more prolonged hospital admission and considerable ongoing costs thereafter.

Clearly the mere existence of a stroke clinic is not enough. Factors such as the frequency of the clinics and the speed of access to the clinic and the necessary investigations are crucial. The availability of carotid endarterectomy without undue delay is also important. It is estimated that about 50% of TIA referrals are for stroke/TIA mimics,⁵ so TIA clinics need to be staffed by clinicians with expertise in diagnosis.

TIA clinics do come at a cost, but this is offset by the clinical and financial benefits. In smaller centres, with a smaller population base, providing a TIA service may be more difficult, and less cost-effective, so that an inpatient model may be preferable in certain environments.

Of paramount importance is rapid access. General practitioners need to recognise possible TIA and know where to send the patients. Ideally, TIA clinics should see high-risk patients within 24 hours; low risk patients within a week. General practitioners need easy access to the TIA clinic. They also need to bypass the TIA clinic if the case is too urgent to wait for the next available clinic. For example, multiple TIAs have a higher risk and may best be managed through the emergency department.

Scoring systems have become important, notably ABCD2 which is the one most widely used. These enable stratification of TIA with a view to planning investigation according to risk of stroke, and also assist in distinguishing TIA from its mimics. Variants to the ABCD2 score, incorporate additional factors, such as MRI findings, and are more accurate in assessing stroke risk.

There have been a number of other changes in the way we think about TIA. The definition has traditionally been “an episode of neurologic dysfunction caused by focal cerebral ischemia with complete recovery within 24 hours”.⁶ In fact, most TIA last less than an hour and MRI has shown that about a third of the TIAs diagnosed clinically are in fact minor strokes.⁷

MRI is a more sensitive test for stroke than CT, but CT is the more widely used initial form of imaging. If MRI is used instead of CT it is important to include sequences which will detect haemorrhage.⁸ Dual therapy with aspirin and clopidogrel may be better than a single agent in the early stages following TIA and stroke.⁹ For patients with atrial fibrillation, alternatives to warfarin have become available in the form of new oral anticoagulants.¹⁰

Whatever options become available for stroke management and prevention in the future, their timely application will be critical for their success. Stroke units and TIA clinics are reducing the incidence and improving the outlook of stroke. The availability and manner in which these are organised will determine who benefits, and it is very appropriate to audit this area of healthcare.

Adequate funding will be necessary to optimise the benefits and cost-savings country-wide. The article in the current issue provides evidence of good progress, but there are no grounds for complacency.

Competing interests: Nil.

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Pacific Islands Families Study: depressive symptoms in 9-year-old Pacific children living in New Zealand

Janis Paterson, Leon Iusitini, Steve Taylor

Abstract

Aim This study investigated associations between individual, maternal, cultural and socio-demographic variables with symptoms of child depression in 9-year-old Pacific children living in New Zealand.

Method The longitudinal Pacific Islands Families (PIF) Study is following a cohort of Pacific children born in Auckland, New Zealand, in 2000. At approximately 9 years postpartum, child self-reports (n=858) of depressive symptoms were gathered.

Results Being a victim or perpetrator of bullying, previous internalising behaviour problems and low maternal education were significantly associated with high child depression scores. Low depression scores were associated with children's positive perception of self, physical abilities, parental and peer relationships, high verbal intelligence, and high performance at school.

Conclusions These findings indicate that building up child self-esteem and supportive relationships around the child are likely to reduce the risk of depression and these strengths may mitigate against bullying involvement.

Pacific peoples living in New Zealand (NZ) are an ethnically heterogeneous (Samoan, 49%; Cook Islands Māori, 22%; Tongan, 19%; and Niuean, 9%), rapidly growing, youthful group. Representing 6.9% of the population, they are highly urbanised, with two thirds living in the Auckland region.¹ The Pacific Islands Families (PIF) Study is a longitudinal birth cohort study of Pacific families that aims to derive a holistic understanding of family health and development on which to base appropriate Pacific-driven intervention strategies.²

Child depression manifests as feelings of sadness, loneliness, hopelessness, agitation and guilt³ and is a debilitating problem than can significantly impair social and school functioning.⁴ Point prevalence estimates for depression are 1-3% for pre-pubertal children and 3-8% for adolescents,⁵ with depression in girls increasing after puberty to twice the rate seen in boys.⁶

Risk factors for child depression include family history of depression,⁷ previous child depression,⁸ poor school performance,⁹ bullying, both as a perpetrator and/or victim,^{10,11} difficult peer relations,¹² inter-parental conflict,¹³ and stressful events.¹⁴ Some studies have reported that minority adolescents experience higher levels of depressive symptoms than European Americans.¹⁵

Studies into the role of demographic factors in childhood depression also reveal inconsistent findings, with low maternal education, single-parent household and lower socioeconomic status being associated with higher levels of depression in some studies¹⁶ but not in others.¹⁷ In the present study we investigated associations

between individual, maternal, cultural and sociodemographic variables with symptoms of child depression in Pacific children.

Method

Participants

The PIF Study is following a cohort of Pacific infants born in Auckland, New Zealand in 2000. Potential participants from one Auckland hospital were selected from births where at least one parent identified as being of a Pacific ethnicity and was a New Zealand permanent resident. Initial information about the mother and child was provided at the hospital and consent was sought to make a home visit. The original cohort included 1,376 mothers of 1,398 Pacific infants (including 44 twins). Compared with data available from Statistics New Zealand's 1996 and 2001 censuses, the inception cohort was broadly representative of the Pacific census figures.¹

Procedures

At 6 weeks (baseline) and at 1, 2, 4, 6 and 9 years postpartum, individual interviews were carried out with maternal participants in their homes. Once informed consent was obtained, mothers participated in interviews concerning family functioning and the health and development of their child. At the 9-year phase 996 mothers were interviewed in relation to 1016 children (including twins) and 891 children were interviewed by a trained child assessor within the school setting. All participants were compensated for their time. Details of recruitment and procedures are available elsewhere.¹

Measures

Child depression—The Children's Depression Inventory¹⁸ was used at 9 years postpartum with the child to identify symptoms of child depression. The 10-item short version (CDI: S) is a self-rated symptom-orientated scale suitable for youths aged 7 to 17 years of age that was developed to provide a psychometrically sound way to screen children for depressive symptoms. The CDI has good internal consistency reliability and test-retest reliability and adequate validity.¹⁹

Child behaviour—The 120-item Child Behavior Checklist (CBCL/6–18)²⁰ was used with mothers at 6 and 9 years. The CBCL is the best-validated behavioural rating scale across many countries and cultures.²¹ Numeric scores for the composite scales (*Internalizing*, *Externalizing*) were derived. Extensive psychometric information based on multicultural comparisons is available.²¹

Gang involvement—A modified version of the Gang Membership Inventory²² has three items: hanging out with a gang, wearing gang colours or using gang signs, and representing a gang in fights or delinquent activities. This measure was used with the child at 9 years and had good internal consistency of 0.83.²³

Maternal mental health—The 12-item General Health Questionnaire²⁴ is a self-report tool used at 9 years to screen for minor psychiatric disorder in adults. It focuses on two areas, the inability to carry out normal functions and the appearance of new and distressing psychological phenomena. High convergent and divergent validity coefficients for the GHQ12 of between 0.83 and 0.93 have been reported.²⁵

Severe physical partner violence—Experiences of partner violence, both as a perpetrator and a victim, were measured at six years using Form R of the Conflict Tactics Scale.²⁶ The CTS measure of severe physical violence includes six items. Mothers were identified as perpetrators of severe physical violence if, in the past 12 months, they reported any of the behaviours towards their partners, and as victims if they reported any of the behaviours from their partners towards themselves. High alpha coefficients for the physical aggression subscale, ranging from 0.77 to 0.88, in nationally representative samples have been demonstrated.²⁷

Postnatal depression—The Edinburgh Postnatal Depression Scale, a self-report instrument focusing on cognitive and affective aspects of depression, was administered at the six-week (baseline) data point.²⁸ The scale does not provide a clinical diagnosis of depression, but a score of above 12 is widely used to indicate a probable depressive disorder. The sensitivity, specificity and predictive validity of the EPDS have been established in a variety of populations.²⁹

Bullying—Bullying questions were based on the Revised Olweus Bully/Victim Questionnaire which examines physical, verbal, and indirect forms of bullying involvement.³⁰ At 9 years, the children were asked eight questions about bullying, separately as a perpetrator (e.g. *'I called another student mean names'*) and as a victim (*'I was called mean names'*). Internal consistency and test–retest reliability are satisfactory.³¹

Life events—A 23-item scale, based on the Social Readjustment Rating Scale, was used with mothers to determine the number of stressful events that had been experienced by the family in the past 12 months.³² High internal consistency ranging from 0.96 to 0.89 has been reported.³³

Perception of self—At 9 years the children's self-perceptions of their physical abilities, parental relationships, peer relationships, general self-perceptions and school were assessed based on the Self-Description Questionnaire.³⁴ Responses to the 10 questions were made on a 5-point scale and pairs of questions were merged into five subscale scores. Strong construct validity has been demonstrated.³⁴

Cognitive development—The Wechsler Intelligence Scale for Children—Fourth edition (WISC-IV) provides a measure of general intellectual functioning. Scores from four subtests of the WISC-IV ("vocabulary", "similarities", "block design" and "matrix reasoning") were paired into two scores, verbal intelligence and non-verbal intelligence, according to the Wechsler Abbreviated Scale of Intelligence (WASI). The WISC-IV has robust psychometric properties.³⁵

Scholastic performance—At 9 years, teachers completed a short questionnaire about the child, which included assessment on a five-point scale (1="very poor" to 5="excellent") of the child's performance in four areas: reading, oral language, written language and mathematics. The four scores were summed to form a single score (Cronbach's $\alpha=0.92$).

Pubertal development—The Pubertal Development Scale was used at 9-years to determine the child's pubertal status.³⁶ Mothers were asked about their son or daughter in terms of growth spurt in height, pubic hair and skin change for both boys and girls; facial hair growth and voice change for boys only; and breast development and menarche for girls only. Adequate internal consistency for boys and girls (0.66 to 0.81) and satisfactory predictive validity of the PDS have been demonstrated.³⁷

Maternal lifestyle factors—At 9 years, mothers were asked whether they smoked yesterday and whether they had consumed alcohol during the past 12 months.

Sociodemographic characteristics—Child gender, child ethnicity, maternal age, New Zealand index of socioeconomic deprivation for individuals (NZiDep) score, maternal education level and marital status were taken into account.

Following the interviews, data were coded and entered into an electronic database (SPSS Data Entry Builder 4.0) that employed comprehensive data validation and checking rules.

Data analysis

This analysis characterises the children's CDI:S scores by assessing associations with various socio-demographic and environmental variables. Multiple regression techniques were used to derive a statistical model to examine variation in the CDI:S scores with respect to the chosen explanatory variables.

Since the outcome variable had a skewed distribution, it was first transformed according to a Box-Cox power transformation that removed the skewedness. This was done to satisfy the assumption that the residuals of the model have approximately a normal distribution with constant variance.

Some differential attrition, inevitable in a large longitudinal study, has been seen in this cohort. For the subset used here, sampling weights were derived based on key baseline demographics (sex and ethnicity of the cohort child; age, NZ born status, education and income of the mother) to calibrate the model to represent the original cohort.

Some variables contained missing values, particularly variables measured at the six-year phase (since families can re-join the study) and data collected from teachers, from whom the response rate was 74%. Multiple imputation techniques (using chained equations) were applied to these missing values to derive 50 separate imputed data sets.

The regression model for each imputed data set was developed using a process of stepwise regression. Starting with an empty model (intercept term only), variables were added one by one. At

each step, model selection was based on the Akaike information criterion (AIC). The process terminated when the model with the lowest AIC score was found.

The final model was derived by pooling the results from models fitted on the 50 imputed data sets, including only variables that were selected in at least 90% of them. Results of the multiple regression model indicated a good fit and assumptions regarding residuals were tested and found to be acceptable. The regression model had an R^2 of 27% indicating that the selected variables explained about a quarter of the variation in the outcome values.

Results

Descriptives

Valid CDI:S data were collected from 858 cohort children. Table 1 describes the sample characteristics by socio-demographic and other categorical explanatory variables and Table 2 describes the distribution of numeric explanatory variables measured at different phases. The mean CDI:S score was 3.05 (SD=2.67) and the mean T-score was 49.97 (SD=8.36). The prevalence of self-reported depressive symptoms (above a T-score of 65) by the children at 9-years-of-age was relatively high at 7.3%.

Table 1. Sample characteristics by sociodemographic and other categorical explanatory variables (N=858)

Phase	Variable and category	<i>n</i>	%
Baseline	Sex of child		
	Female	429	50.0
	Male	429	50.0
	Ethnicity of child		
	Samoan	392	45.7
	Cook Island	148	17.3
	Niuean	43	5.0
	Tongan	191	22.3
	Other Pacific	84	9.8
	Mother had postnatal depression		
	No	718	83.7
	Yes	134	15.6
	Missing	6	0.7
Year 6	Mother was a victim of inter-partner violence		
	No	744	86.7
	Yes	60	7.0
	Missing	54	6.3
	Mother was a perpetrator of inter-partner violence		
	No	721	84.0
Yes	81	9.4	
Missing	56	6.5	
Year 9	Marital status of mother		
	Partnered	638	74.4
	Non partnered	213	24.8
	Missing	7	0.8
	Smoking status of mother		
Non-smoker	553	64.5	

Phase	Variable and category	n	%
	Smoker	296	34.5
	Missing	9	1.1
	Mother's highest education		
	None or secondary school	516	60.1
	Post school qualification	339	39.5
	Missing	3	0.4
	Mother's GHQ12 depression		
	Non-symptomatic	789	92.0
	Symptomatic	65	7.6
	Missing	4	0.5
	Mother's alcohol usage		
	Non drinker	503	58.6
	Drinker	347	40.4
	Missing	8	0.9
	Child's puberty had started (maternal report)		
	No	689	80.3
	Yes	169	19.7

Table 2. Sample characteristics, showing distributions of numeric explanatory variables (N=858)

Phase	Interviewee	Variable	Missing	(%)	Mean	SD
Year 6	Mother	Internalising	115	13.4	4.93	4.85
		Externalising	115	13.4	8.78	6.54
Year 9	Mother	NZiDep score	22	2.6	2.94	1.23
		Major life events	0	0.0	2.27	2.09
		Internalising score	10	1.2	5.64	4.57
		Externalising score	10	1.2	8.10	5.94
		WISC-IV – verbal score	2	0.2	33.35	9.23
Year 9	Child	WISC-IV – perceptual score	16	1.9	41.01	11.68
		Self-perceptions – physical ability	0	0.0	8.75	1.46
		Self-perceptions – parental relations	3	0.3	8.79	1.30
		Self-perceptions – peer relations	3	0.3	7.78	1.50
		Self-perceptions – school	0	0.0	8.01	1.48
		Self-perceptions – general self	8	0.9	7.43	1.59
		Gang involvement	0	0.0	0.07	0.29
		Bullying – victim	0	0.0	2.68	2.38
		Bullying – perpetrator	0	0.0	0.81	1.35
		Year 9	Teacher	Scholastic performance score	223	26.0

Regression model

Design—After the final model formula was chosen, it was applied to the imputed data sets and the results were pooled. Table 3 presents the pooled coefficient estimates of all the variables included in the final regression model applied to the imputed data sets. All variables mentioned in Tables 1 and 2 but not appearing in Table 3 were excluded due to a lack of evidence of association with depression scores.

Associations—Higher bullying perpetration and victimisation scores were significantly ($p<0.001$) associated with greater child depression scores. Children whose mothers reported internalising behavioural problems at six years had significantly higher depression scores ($p<0.05$).

Children of mothers with post-secondary education reported significantly lower levels of depressive symptoms ($p<0.05$), as did children with positive perceptions about their general self, their physical abilities and their school performance.

School performance is also reflected in the significant association of lower depression scores with higher teacher-reported scholastic performance and higher verbal intelligence scores.

Children who reported positive perceptions about their relationships with parents and peers also reported significantly lower levels of depressive symptoms. Based on standardised coefficients, the strongest associations were for being a victim of bullying ($\beta=0.20$) and scholastic performance ($\beta=-0.18$).

Table 3. Associations with CDI:S scores derived from the final regression model

	Coefficient estimate	(95% CI)	Standardised coefficient (β)	(95% CI)
Mother's highest education				
Up to secondary	0.00	(reference)		
Post-secondary qualification	-1.08	(-2.08, -0.07)*		
Child behaviour (maternal report)				
Internalising (at age 6)	0.11	(0.00, 0.21)*	0.06	(0.00, 0.12)*
Child's bullying scores				
as a perpetrator	0.76	(0.37, 1.15)***	0.12	(0.06, 0.18)***
as a victim	0.69	(0.47, 0.91)***	0.20	(0.13, 0.26)***
Child's self-perception scores				
General self	-0.60	(-0.96, -0.23)**	-0.11	(-0.18, -0.04)**
Parental relationships	-0.51	(-0.91, -0.11)*	-0.08	(-0.14, -0.02)*
Peer relationships	-0.74	(-1.10, -0.39)***	-0.13	(-0.20, -0.07)***
Physical abilities	-0.39	(-0.73, -0.04)*	-0.07	(-0.13, -0.01)*
School performance	-0.42	(-0.80, -0.05)*	-0.08	(-0.14, -0.01)*
Child's WISC-IV test				
Verbal intelligence score	-0.08	(-0.14, -0.01)*	-0.09	(-0.16, -0.01)*
Teacher assessment				
Scholastic performance score	-0.39	(-0.57, -0.20)***	-0.18	(-0.26, -0.09)***

P-values: * < 0.05; ** < 0.01; *** < 0.001

Discussion

Recognising depression as early as possible in late childhood is a critical step in reducing the prevalence of this debilitating illness in adolescence. Prevalence estimates of depression for pre-pubertal children range between 1 and 3%.

A relatively high prevalence (7.3%) of depressive symptoms was found in this cohort of 9-year-old Pacific children. The use of a screening measure rather than a clinical diagnosis partly explains this higher level of reported depressive symptoms but these findings indicate the presence of significant distress that may impact severely on the lives of these children. No ethnic or gender differences were found but some individual factors exerted a significant effect on child depression.

Bullying is widespread among middle school students presenting a serious threat to healthy development. Children involved in bullying show evidence of unhappiness,³⁸ anxiety, and depression and are often referred for psychiatric consultation.¹¹ In line with these findings, Pacific children who were involved in bullying, as a victim or perpetrator, reported significantly higher levels of depressive symptoms than children who were not involved in bullying. These findings highlight a need for evidence-based policies and procedures to minimise the damage of bullying on young children.

Children identified as exhibiting internalising behaviour at six years reported high levels of depressive symptoms at 9 years. During late childhood, depressive symptoms are likely to remain moderately stable and predictive of later depressive disorders.³⁹ Isolating internalising behaviour patterns may negatively affect their peer relationships and lead to involvement in bullying, as victims and/or perpetrators.

Identifying preadolescent behaviours that predict emerging depressive symptoms is critical to understanding the phenomenology of depression, as well as for prevention and intervention.

Children with positive perceptions about their general self, their physical abilities, and their school performance reported significantly lower levels of depressive symptoms. The importance of school performance is also reflected in the significant associations between high teacher-rated scholastic performance scores and high verbal intelligence scores with low depression scores.

It is posited that children's cognitions and perceptions of their own ability to affect outcomes may protect against depression in childhood.⁴⁰ Children who reported positive perceptions about their relationships with parents and peers also reported significantly lower levels of depressive symptoms. This finding underlines the critical role that positive relationships with parents and peers play in determining the development and maintenance of childhood wellbeing.

There was no gender difference in depressive symptoms, and there was no effect of onset of puberty. With the exception of low maternal education we found no associations between SES variables and child depression. Children of mothers with no qualifications beyond high school reported significantly higher levels of depressive symptoms.

Maternal education is linked to the overall family socioeconomic situation and as such is likely to affect child depression as part of a web of familial factors. More highly educated mothers may be more likely to identify depressive symptoms in their children and embrace the use of health services more effectively and thus minimise the development of depression.

Some studies have reported ethnic differences in child depression,¹⁵ however we found no such differences in depressive symptoms among Pacific children. Although described as strong predictors of depression in childhood,⁴¹ we also found no associations between child depression and parental depression, stressful life events, and family instability. These null results are not shown in Table 3. High levels of depressive symptoms were mostly associated with the child's individual experiences and self-perceptions rather than their family context.

It is acknowledged that the use of self-report measures may lead to underreporting, however in large scale studies self-report is usually the most feasible option for measurement. In terms of bullying involvement, peer nominations or observational methods may provide a more comprehensive picture.⁴²

Recognising depression in young children is an important step towards reducing the prevalence of depression, leading to better management of symptoms and preventing serious outcomes. These findings highlight the contribution that positive perceptions of self, supportive relationships with family and friends, and school success make to the wellbeing of young people. This suggests that building up self-esteem and social skills combined with anti-bullying measures in the school context is likely to contribute to decreasing the prevalence of childhood depression.

Competing interests: Nil.

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Changes in the provision of transient ischaemic attack services in New Zealand 2008 to 2013

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Abstract

Background Urgent assessment and management of patients with transient ischaemic attack (TIA) reduces the early risk of stroke. In 2008 an audit was conducted of TIA services in New Zealand and a substantial discrepancy was found between clinical practice and recommendations in TIA guidelines. We aimed to re-evaluate the situation again in 2013 to determine if there had been any change in provision of TIA services.

Methods A brief written questionnaire, based on the 2008 survey, was sent to lead stroke clinicians at all district health boards. Questions were asked about the provision of services, including investigation and management of patients with TIA.

Results The questionnaire was completed by all DHBs. The number of DHBs with a dedicated TIA clinic has increased from 3 in 2008 to 15 in 2013 and the number with a clinical pathway for assessment of patients with TIA has increased from 5 to 17. Brain and carotid imaging is usually available within 48h for patients assessed as having high stroke risk. Delays for other patients remain frequent for brain imaging in 14 DHBs and for carotid imaging in 16 DHBs. There was a decrease in the number of DHBs with a wait of more than a week for carotid endarterectomy when indicated from 16 in 2008 to 4 in 2013.

Conclusion There have been significant improvements in the provision of TIA services over the last 5 years. However in order to reduce the burden of stroke, DHBs need to consider further investments into adequately resourced TIA services as a priority.

Among patients presenting with a transient ischaemic attack (TIA), the risk of completed stroke may be as high as 10% in the first 48 hours.¹ Early implementation of secondary prevention, including the timely identification and treatment of carotid stenosis and atrial fibrillation, can reduce the risk of early stroke by as much as 80%.^{2,3}

Accordingly over the last 10 years there has been a significant move to consider TIA a medical emergency with a change in service models from routine outpatient assessment to rapid access specialist TIA clinics and inpatient admission for patients at highest risk of stroke.²⁻⁴

In 2008, we conducted an audit of TIA services in New Zealand.⁵ A substantial under-provision of TIA services, and delayed investigation and management of patients with carotid stenosis, was found when compared with best practice recommendations. Since 2008, national guidelines have been published on the assessment and

management of TIA and a substantial effort has gone into improving stroke and TIA guideline implementation throughout NZ.^{6,7}

A modified audit was repeated to determine if publication of these guidelines, and increasing awareness of the early risk of stroke following a TIA, has led to changes in the provision of TIA services.

Methods

In August 2013, the lead stroke physician or head of medical services at all 20 district health boards (DHBs) was asked to complete a questionnaire regarding local organisation of TIA services, access to investigations and management of patients with TIA, and clinical audit activity.

Otago and Southland DHBs merged in 2010, and a separate questionnaire was also sent to Southland Hospital to enable direct comparison with the 2008 survey. The questionnaire could be completed in less than 10 minutes. Responses from the current survey were compared with those from the survey conducted in 2008.

Results

Clinicians at all 20 DHBs, and Southland Hospital (reported hereafter as 21 'DHBs'), returned the questionnaire. The respondents were neurologists in 7 (33%), general physicians in 5 (24%), geriatricians in 5 (24%), stroke physicians in 2 (9.5%) and other clinicians in 2 (9.5%) DHBs. 19 (90%) DHBs had a clinical lead who coordinates stroke and TIA services, an increase from 13 (62%) in 2008.

Compared with 2008, more DHBs manage TIA patients in the outpatient setting (Table 1). 15 (71%) DHBs have a dedicated specialist TIA clinic; of these 14 (67%) provide a 'rapid access' service for urgent outpatient evaluation of suspected TIA patients. No DHBs routinely admit patients with TIA, compared with 3 (14%) in 2008.

Table 1. Service provision and investigation of TIA patients in 2008 and 2013

Variables	2008 (n=21)	2013 (n=21)
Lead physician for stroke / TIA services	13	19
Dedicated TIA clinic	6	15
Usual assessment setting		
TIA clinic	3	10
Emergency department	10	5
Acute assessment unit	5	6
Inpatient admission	3	0
Location for patients requiring admission		
Stroke unit	3	6
Acute assessment unit (AAU) / medical wards	18	15
TIA pathway	5	17
Neuroimaging		
All patients	9	10
Most patients	12	10
Some patients	0	1
Waiting time for carotid endarterectomy		
<1 week	5	16
1 week–1 month	12	1
>1 month	4	3

Twice as many DHBs now admit patients who require hospital admission to acute stroke units rather than general medical wards or medical assessment units. 2 (9.5%) DHBs routinely follow TIA patients after an initial specialist assessment, down from 4 (19%) in 2008.

The number of DHBs that have clinical guidelines for TIA management has increased from 13 to 17 (81%). These guidelines incorporate recommendations for investigations in 17 DHBs, and secondary prevention in 15 DHBs. 17 (81%) DHBs have a clinical pathway for the evaluation of patients with suspected TIA, compared with 5 (24%) in 2008. Clinical pathways include sections relevant to general practitioners in 14, ambulance services in 6, emergency physicians in 17, radiologists in 16 and vascular surgeons in 14 DHBs.

Eighteen (86%) DHBs stratify TIA patients into high and low-risk groups on the basis of clinical features or risk-stratification tools to plan clinical assessment and investigations (Table 2).

Table 2. Usual waiting times for assessment and imaging in the 18 DHBs that stratify TIA patients into high- and low-risk groups

Waiting time	Assessment		CT Head		Carotid USS	
	Low risk	High risk	Low risk	High risk	Low risk	High risk
<24 hours	0	14	3	13	1	6
24–48 hours	2	2	1	4	0	8
>48 hours	11	2	5	1	11	3
>1 week	5	0	9	0	6	1

Fourteen of 18 (78%) DHBs usually assess high-risk patients within 24 hours, but two DHBs see these patients after 48 hours. 11 of 18 (61%) DHBs usually assess low stroke risk patients between 48 hours and 1 week, and after more than 1 week in 5 (24%) DHBs. These 18 DHBs were asked to estimate waiting times for neuroimaging and carotid ultrasound among high and low-risk patients.

In only one (5%) DHB do high-risk patients usually wait for more than a week for carotid ultrasound, compared with 10 (48%) DHBs in 2008. Low-risk patients still wait for more than one week for carotid ultrasound in 6 (29%) DHBs.

The usual wait for carotid endarterectomy in patients with haemodynamically significant carotid stenosis is more than a week in 4 DHBs, a marked reduction from 16 in 2008. The waiting time for carotid endarterectomy was less than a week in all 10 DHBs with an on-site vascular service, compared with 7 of the 11 DHBs without a vascular service.

Clinical audit activity of TIA services has increased since 2008. 9 (43%) DHBs now conduct audit at the service level, compared with 3 (14%) DHBs in 2008. The issues identified as being most important for ongoing development of TIA services included improved access to investigations (n=8); education of GPs, ambulance staff and emergency physicians (n=5); improved access and efficiency of an existing TIA clinic

(n=3), or establishing a TIA clinic (n=2); and development of a pathway for TIA patients (n=3).

Discussion

The findings of this national audit of TIA services show significant improvements over the past 5 years. There has been an increase in the number of lead stroke and TIA clinicians. More TIA patients are now seen in the ambulatory rather than the acute care setting with an increase in the number of dedicated TIA clinics.

The number of DHBs using local guidelines and clinical pathways to standardise and streamline TIA care has increased. Finally, there have been improvements in the usual waiting times for specialist assessment, key investigations and carotid endarterectomy.

It is encouraging that 15 DHBs now have dedicated TIA clinics. In 10 DHBs the TIA clinic is now the main setting for TIA patient assessment. The number of DHBs where TIA patients are usually seen in the emergency department has fallen by half and there are no longer any DHBs where TIA patients are routinely admitted to hospital. However, it is not sufficient to have a TIA clinic if patients are not seen in a timely manner. Rapid access TIA clinics reduce the risk of stroke, neurologic disability and death.^{2,3}

In larger DHBs TIA clinics should operate at least 5 days per week and a less frequent service may result in delays in obtaining investigations, starting secondary prevention and ultimately preventing stroke. Smaller DHBs serving a population of 100,000 or less can expect 2–3 patients with TIA each week.⁸ In this setting coordinated care through GPs and emergency department services with rapid access to necessary investigations and input from a stroke physician or stroke nurse specialist may be more feasible than a dedicated TIA clinic.

Not all TIA patients have the same stroke risk. Patients with recurrent (crescendo) events, atrial fibrillation and persisting neurologic symptoms require urgent evaluation, probably in the inpatient setting.³ Other patients such as those with isolated sensory symptoms or those with transient neurological symptoms that occurred more than a week ago are at a much lower risk of stroke and may need less urgent assessment. Risk stratification tools are available to identify stroke risk and prioritise assessment and investigations.

The most widely used risk stratification tool is the ABCD2 score incorporating age, blood pressure, clinical features, duration of symptoms and diabetes has been shown to correlate with the risk of stroke after TIA.⁹ The ABCD2 score has been incorporated into national and international TIA guidelines,^{6,10} and many DHBs now use it, along a number of other clinical features, to stratify TIA patients.

Approximately half of the strokes that follow a TIA occur in the first 48 hours after symptom onset. NZ guidelines recommend that TIA patients at high stroke risk are assessed “as soon as possible but definitely within 24 hours”, and low-risk patients within 7 days.⁶ In the SOS-TIA study, where a rapid-access TIA clinic led to a 79% reduction in the risk of stroke, 87% of patients were seen within 24 hours of the event.

It is therefore encouraging that more than three quarters of DHBs see high-risk patients within 24 hours. However, it is of concern that four DHBs usually see high-risk patients after 24 hours, and 5 DHBs see low-risk patients after 1 week. Delays in the assessment and investigation of patients with TIA represent a missed opportunity for early implementation of secondary prevention.

New Zealand guidelines recommend brain imaging within 24 hours among high-risk patients, and within one week in low-risk patients.⁶ This is in order to exclude TIA mimics where antithrombotic treatment may be contraindicated such as subdural haematoma, mass lesions and convexity subarachnoid haemorrhage due to cerebral amyloid angiopathy.⁶

Almost one-third of DHBs reported that high-risk patients usually wait more than 24 hours for brain imaging and in more than half of DHBs low-risk patients usually wait more than a week for brain imaging.

Among TIA patients with severe (>70%) ipsilateral carotid stenosis, the 90-day stroke risk may be as high as 1 in 4.¹¹ Candidates for carotid revascularisation should be screened with carotid ultrasound within 1 week, or within 1 working day if considered at high stroke risk.⁶

While there have been improvements since 2008, in 6 DHBs low-risk patients are still usually waiting for more than a week for carotid ultrasound. CT carotid angiography done at the same time as CT brain scanning may be an alternative approach in those centres where there is limited access to carotid ultrasound.¹²

Carotid endarterectomy reduces the risk of stroke in patients with severe ipsilateral carotid stenosis and the most benefit is gained if it is done within 2 weeks of TIA.¹³ It is therefore encouraging to see that the usual wait for carotid endarterectomy is now less than one week in 17 DHBs, compared to 4 in 2008.

The benefit of carotid endarterectomy is much lower if performed more than a month after TIA, and may be eclipsed by the risk of peri-procedural stroke and other complications.¹³ It is of concern that the usual wait for carotid endarterectomy is still greater than 1 month in 3 DHBs. All of the DHBs where patients routinely wait more than a week for carotid endarterectomy do not have a local vascular surgery unit, suggesting a need for better coordination of regional services.

The additional resources required to set-up and run rapid access TIA clinics may be unattractive to DHBs. However, TIA clinics lead to a number of direct and indirect cost savings, including freeing up resources in busy emergency departments and reducing the number of patients requiring inpatient assessment.

In a UK study, the institution of a rapid assessment TIA clinic reduced the mean number of hospital bed days from 6 to 2 and the mean cost per patient from £1056 to £432, effects primarily driven by a reduction in hospital admissions with stroke.¹⁴ These short-term savings are relatively small compared with the long-term costs of caring for people living with disability due to stroke. Other improvements to TIA services are not necessarily costly.

An effective service requires prompt access to key investigations. Better coordination with local radiology services with dedicated slots for brain and carotid imaging may lead to faster institution of secondary prevention measures without an increased cost.

This study has a number of limitations. Questionnaires offer a convenient means of surveying clinical practice in a large number of hospitals. This survey is one of a number on the provision of stroke services carried out over a number of years and so we have been able to identify individuals with interest in stroke and TIA in most of the DHBs.^{15,16} It was made clear that no individual DHB would be identified, however, it is possible that responses do not reflect actual practice and no attempts were made to verify responses.

There were also some differences between the current and 2008 surveys. Responses about the timeliness of assessment and investigations were separated into those for high and low stroke-risk patients in the current survey. This was not done in 2008 so that direct comparisons were not always possible.

Conclusion

There have been significant improvements in the provision of TIA services in New Zealand over the last 5 years. However, almost a quarter of DHBs still have no dedicated TIA services and there are still delays in obtaining brain and carotid imaging and carotid endarterectomy. In order to reduce the burden of stroke, DHBs need to consider adequately resourced TIA services a priority.

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Sex workers' utilisation of health services in a decriminalised environment

Gillian Abel

Abstract

Background In 2003 the Prostitution Reform Act (PRA) was passed in New Zealand which decriminalised all activities associated with sex work.

Aim To explore sex workers' utilisation of health services in New Zealand following decriminalisation of sex work and disclosure of their occupation to health professionals.

Method A cross-sectional survey was carried out with 772 sex workers and in-depth interviews were carried out with 58 sex workers in New Zealand.

Results Most sex workers have regular sexual health check-ups and most access their general practitioner (GP) for both general health needs (91.8%) and sexual health needs (41.3%). A quarter of the participants accessed a local sexual health centre for their sexual health needs and just over 15% accessed New Zealand Prostitutes' Collective's (NZPC's) Sexual Health Clinic. Little change was found in disclosure of occupation to health professionals following decriminalisation. Sex workers remain concerned about disclosing their occupation because of perceived stigma attached to their occupation.

Conclusion Most sex workers have regular sexual health check-ups and most access their GP for this service. However, because of on-going perceptions of stigmatisation many do not report their occupation to their GP which may mean that check-ups may not be comprehensive. For this reason, sexual health check-ups performed at NZPC may be preferable to check-ups elsewhere because disclosure of occupation is not an issue.

In 2003 the Prostitution Reform Act (PRA) was passed in New Zealand which decriminalised all activities associated with sex work. Prior to this, although sex work itself was not criminalised, all activities associated with it were.

It is useful to examine whether decriminalisation has changed the way sex workers interact with health care professionals. There have been many commentators writing in the context of criminalised sex work environments who have reported on the distrust sex workers have towards health care workers.¹⁻⁵

Much of this distrust arises out of sex workers' fears of judgemental and discriminatory attitudes. There is a perceived threat posed by visiting doctors, psychologists and other health professionals⁴ and it has been noted that sex workers prefer non-medical healthcare providers because of perceptions that doctors would not be accepting of their profession.¹

When sex workers do not reveal their occupation to their doctors, it makes it difficult for the doctors to provide appropriate care and support.

A study carried out in Christchurch in 1999 prior to decriminalisation found that only 12 of the 302 sex worker respondents did not go for sexual health checks.³ General practitioners (GPs) were the most commonly used medical provider for sex workers accessing sexual health services. Of the 251 (83%) women who reported having their own GP, 135 (54%) reported going to that GP for sexual health checks. However, only 84 (62%) of these 135 workers disclosed that they were sex workers to their GP.

This paper examines whether there have been changes in utilisation of health services since decriminalisation and whether sex workers are any more likely to disclose their occupation to health service providers.

Methods

The research was conducted by public health researchers from the University of Otago, Christchurch, in partnership with the New Zealand Prostitutes' Collective (NZPC). Ethics approval was obtained from the Multi-region Health and Disability Ethics Committee.

The study was carried out in Auckland, Wellington and Christchurch as well as two smaller regional cities: Nelson and Napier. Between June 2006 and January 2007, a questionnaire was administered by NZPC staff, trained in interviewing techniques, to a sample of sex workers in the five cities.

Although random sampling was not carried out, care was taken to represent the diversity of the industry within the final sample by conducting an estimation of the number of private (people working for themselves and not giving a portion of their money to others), managed (people working in brothels and escort agencies under a system of management) and street-based sex workers, including the gender distribution within each sector, across the five locations of the study.⁶

Participants were sampled purposively within the sectors and locations of the study and street-based, small city, male and transgender workers were over-sampled because of smaller numbers in these populations. The final sample achieved was 772, which represents 32% of the estimated sex worker population across those areas. Questionnaire data were analysed using SAS 9.1.

In-depth interviews were carried out with 58 sex workers in the five locations of the research between August 2006 and April 2007. The diversity of the industry was also reflected in this sample. The interviews utilised a semi-structured interview guide and were conducted by NZPC outreach workers who had been trained by us in interviewing techniques. All interviews were digitally recorded and transcribed to word accuracy. Thematic analysis was undertaken.

Transcripts were read and re-read, and datasets were developed by cutting and pasting relevant quotations by participants around a range of subject areas. Each data-set was analysed, identifying themes or patterned responses or meaning. Names of all participants have been changed to protect their identity.

Results

Most sex workers in this study stressed their social responsibility in ensuring that they did have regular sexual health checks.

I tend to do my STD and blood tests at the NZPC just 'cos I like catching up with the people and coming in to see, you know, the nurse and saying 'hi'. You know, because it's just a comfortable environment to be in. The people don't judge you and that sort of thing. Ever since I've been sexually active, I've always made sure I've had regular tests, STD and blood tests. Obviously since I started working I make sure I get it every 3 months.

(Sheila, Managed, Female)

Health-wise, I go and have a check-up once a month at, you know, at the doctor's and I have all tests and all that. You know, I mean especially if a condom has broke, you know, so I mean I certainly look after myself, because, you know, I value my life and my health.

(Joan, Street, Female)

Few survey participants reported that they did not go for sexual health check-ups, with managed workers the least likely of all participants to report this (see Table 1).

Most participants indicated that they accessed their GP for their general health needs (91.8%) as well as their sexual health needs (41.3%). A local Sexual Health Centre was the second most utilised facility for sexual health check-ups with one-quarter of participants indicating that this was their preferred option, particularly for managed and private sex workers.

The third most utilised service for sexual health check-ups was NZPC with 15.5% of the survey participants indicating that they attended this service on the days that either a sexual health doctor or nurse was running a clinic (see Table 1). There was, however, a significant difference between numbers of people attending NZPC services for their sexual health needs in the different cities. Sex workers in the smaller centres do not have the option of attending a NZPC clinic.

In Auckland, 11.7% of participants reported accessing NZPC for sexual health check-ups, 13.9% in Christchurch and 36.0% in Wellington (χ^2 54.6, 2df, $p < 0.0001$).

Clinics are held at NZPC offices for three hours once a week in Christchurch and Auckland, and twice a week in Wellington. The fact that sex workers in Wellington had 6 hours a week, as opposed to 3 hours in the other big cities, to access these services could explain the difference in attendance.

Many participants in in-depth interviews did access NZPC for their sexual health check-ups and these participants were clear that they found the services less judgemental than that provided by other health professionals, they were more comfortable talking over intimate issues and there was a greater level of trust.

Jack: My GP is not aware of the fact that I work. I deal with (X) here at NZPC, and any issues surrounding, or around my sexuality, my sex work, she deals with those, and that's actually really good. It makes it a lot easier because the two, it's almost like I've compartmentalised my life. My GP has all of my history, you know, from right from zero to whenever to now. And (X), I trust her on a different level with my information, so yeah.

Interviewer So it comes down to a level of trust in having that information?

Jack Yeah, absolutely, and I trust her more than I do my GP. I trust my GP will look after my health, but I trust (X), because of her, that's there, she's in the environment, you know, of looking after people that are sexually active, sexual health and those sort of things, so.

(Jack, Private Male)

Two-thirds (64.9%) of survey participants reported that they accessed NZPC's drop-in service: street-based and private sector workers were significantly more likely to report this than participants in the managed sector.

Table 1. Participants' access to health services by sector[†]

Variables	Total % (SE)	Street workers % (SE)	Managed indoor % (SE)	Private indoor % (SE)	Comparison across sectors
Participants having a regular doctor (N=767)	86.9 (1.4)	80.9 (3.1)	88.1 (1.8)	87.6 (3.0)	$\chi^2=10.1$; df=2; p=0.006
Participants who have a regular doctor informing doctor of occupation (N=653)	53.9 (2.3)	69.2 (4.3)	49.7 (2.9)	54.6 (4.8)	$\chi^2=27.9$; df=2; p<0.0001
Services accessed for general health needs:					
Own GP (N=753)	91.8 (1.2)	85.4 (2.8)	93.8 (1.4)	91.4 (2.6)	$\chi^2=19.3$; df=2; p<0.0001
NZPC (N=696)	17.7 (1.6)	31.8 (4.2)	14.8 (2.0)	16.2 (3.3)	$\chi^2=41.3$; df=2; p<0.0001
Youth organisation (N=680)	1.5 (0.4)	5.8 (1.5)	0.8 (0.4)	0.9 (0.7)	$\chi^2=49.8$; df=2; p<0.0001
Social worker (N=686)	3.0 (0.6)	9.1 (2.6)	2.0 (0.8)	1.9 (0.9)	$\chi^2=47.1$; df=2; p<0.0001
Counsellor (N=687)	9.1 (1.2)	14.9 (3.1)	7.9 (1.4)	8.6 (2.2)	$\chi^2=14.3$; df=2; p=0.0008
Physiotherapist (N=686)	8.1 (1.3)	6.2 (2.5)	5.9 (1.3)	12.7 (3.1)	$\chi^2=22.1$; df=2; p<0.0001
Chiropractor (N=685)	5.8 (1.0)	5.5 (2.2)	5.0 (1.2)	7.4 (2.0)	$\chi^2=4.2$; df=2; p=0.1
Podiatrist (N=684)	2.3 (0.6)	2.9 (1.6)	2.0 (0.8)	2.4 (1.1)	$\chi^2=1.0$; df=2; p=0.6
Complementary practitioner* (N=685)	12.8 (1.5)	7.3 (2.6)	10.4 (1.7)	19.1 (3.6)	$\chi^2=30.8$; df=2; p<0.0001
Mental health worker** (N=690)	8.9 (1.2)	12.0 (2.9)	7.7 (1.4)	9.5 (2.3)	$\chi^2=5.7$; df=2; p=0.06
Nowhere (N=626)	4.2 (1.0)	8.1 (2.1)	3.5 (1.2)	3.7 (2.0)	$\chi^2=8.9$; df=2; p=0.01
Services accessed for sexual health needs: (N=769)					
Own GP	41.3 (2.1)	47.4 (4.1)	40.6 (2.7)	39.8 (4.3)	$\chi^2=91.0$; df=14; p<0.0001
Another GP	3.0 (0.7)	3.4 (1.6)	3.1 (0.9)	2.5 (1.3)	
NZPC	15.5 (1.5)	12.8 (2.6)	14.6 (1.8)	18.1 (3.3)	
Family Planning	9.7 (1.3)	8.0 (2.5)	12.4 (1.8)	6.0 (2.2)	
Sexual Health Centre	25.2 (1.9)	17.1 (3.1)	26.6 (2.5)	26.3 (4.0)	
Youth Health Centre	1.2 (0.3)	3.8 (1.1)	0.6 (0.3)	1.2 (0.7)	
Other	0.4 (0.2)	0.3 (0.3)	0.2 (0.2)	0.8 (0.6)	
Don't go for sexual health check-ups	3.7 (0.9)	7.1 (1.9)	1.8 (0.7)	5.5 (2.2)	
Access NZPC drop-in services: (N=755)					
Yes	64.9 (2.1)	74.9 (3.1)	58.0 (2.7)	71.7 (4.1)	$\chi^2=47.7$; df=2; p<0.0001
No	35.1 (2.1)	25.1 (3.1)	42.0 (2.7)	28.3 (4.1)	

[†] Weighted estimates to account for variation in probability of selection and response.

* Complementary health practitioner e.g. naturopath, homeopath, therapeutic masseur.

** Mental health worker e.g. psychologist, psychiatrist.

During in-depth interviews, some street-based workers gave accounts of how NZPC were vital in ensuring their sexual health through their provision of condoms at a subsidised rate. Some indicated that without that service they might not personally go and buy condoms.

I mean if it wasn't for them, you know, I couldn't really basically - well I wouldn't actually go out and buy the condoms. It's not something I do, you know, go out and purchase condoms just, you know, even though it's for my safety. Yet it's comfortable to go to the NZPC or the condom ladies to basically give them to you, because it's normal and it's just like much better and you feel comfortable taking condoms off them. And it's not in a store where they'll have to, you know, say, you know, "Can I have a price check on such and such condoms," you know.

(Terri, Street, Transgender)

Other participants valued the information they received from NZPC about bad clients, what to expect when they were new to the job as well as information on their rights.

I'm aware that we do have rights, and that's what NZPC helps a lot, 'cos if it wasn't for NZPC and the YCD ones, yeah, none of us would be here now, because, you know, if it wasn't for them being able to take time out of their own personal time, sit down, have a chat with us. They get a nurse around - we've got our own, you know, nurse that helps us with everything. Like makes sure we're clean, does our tests and everything, you know. If it wasn't for these people, we'd be all, we'd probably all be 6 feet under.

(Joyce, Street and Private, Female)

I went in there (NZPC) before I started working, and they gave me a whole lot of information about what the, what my rights were. And yeah, so they sort of told me what was expected in the room and what wasn't. You know, what you're allowed to ask for more money was, or you know, for and that sort of thing.

(Jenny, Managed, Female)

The majority of survey participants reported having their own GP (see Table 1). However, only half of the participants who reported having a GP indicated that they told him/her that they were sex workers. Street-based workers were the most likely sector to report their occupation to their GPs with managed workers the least likely. Some of the participants in in-depth interviews said they informed their doctor of their occupation. They ensured that by disclosing this information that they were seen as being responsible and getting comprehensive check-ups.

I'm totally open with health professionals. It's like I'm speaking with you, they can ask me something and I'm totally honest with them. You know, what's the point in going to a doctor if you're not going to be real with them. They can't possibly do anything for you if you're not honest, you know.

(Paul, Street, Male)

Because I'm quite an open talkative person, doctors and Family Planning, you think like they, they're not allowed to say anything, and it's better if they know, 'cos then they can help you out. Whereas if they don't know, they just think I'm just having sex with a boyfriend or, you know, or a couple of guys, and not knowing the full extent of it, and they don't, they can't understand me.

(Debbie, Managed, Female)

However, there were many participants who did not see the need to disclose their occupation to their doctor.

Obviously I haven't mentioned to them that I'm a sex worker. I don't really see the need. You know, it's not, it doesn't seem to be an issue.

(Lorraine, Private, Female)

I think because of my prescription, and I just think that maybe he would stop my prescription if he knew I was back out working. Yeah. He used to be my methadone doctor when I was on methadone. And then I've given him quite a bit of bullshit in the past, so, you know, I just, yeah, there's just some things your doctor doesn't need to know.

(Joan, Street, Female)

The stigma attached to sex work prevented many from disclosing their occupation and this has implications for the sexual health of sex workers. There were fears of negative reactions and judgementalism.

Yes, see, I think it just depends on the medical worker. Most medical workers who've been working for a certain amount of time, they are sweet with it, you know, 'cos they've heard everything, they've seen everything, and they don't mind. I find it's usually like religious nurses that I've come across and they're like, "Oh, oh, you do that, do you?" And I'm just, "Well fuck, you know, what do you want me to tell you? Yes, I do that, yes, I'm a very happy person, don't try to commit suicide on a weekly basis," you know. And it's usually the same stigma of it and it's just, it's a fucking joke, especially in this day and age, but you can't change some people.

(Vicky, Managed, Female)

Another concern for many participants was that their GP was not only their doctor but was also the family GP. If they did not disclose their occupation to their family, they perceived a danger in disclosing to somebody like a GP who had a relationship with their family. In some cases, the GP had known them since childhood and disclosing to him/her held risk for altering the relationship.

It's too close to home and the fact that my mum and my brother and myself and my daughters are all with the same doctor, I feel he sees us as this nice family unit, and I'm certainly not going to break it.

(Ann, Managed, Female)

Yeah, 'cos it's quite like changed now 'cos like some of them don't think it's really good for you to work when you've got children, 'cos they're thinking of the children, hey. I understand where they're coming from, like they're thinking more of the children. But as long as they know that the children's been taken care of, you know, and the reason why you're doing it is to survive, you know, and you're a solo mother, then it's, you know, it should be pretty much all right. But no.

(Toni, Street, Female)

Discussion

The majority of sex workers in this study were accomplished in practising safe sex in their working lives⁷, but it is important to explore whether they managed other areas of their sexual health in an equally effective way. There is no provision under the PRA for compulsory periodic sexual health check-ups which are a requirement in many countries, especially those which have legalised sex work.⁴ It is acknowledged under section 8 of the PRA that medical certificates showing an absence of STIs are only valid at the time of testing and instead there are efforts to promote safer sex cultures within the legislation.

Direct comparisons can be drawn between results from the 1999 study of Christchurch female sex workers and results from the 2006/07 survey as identical questions were asked in both surveys. With regards to utilisation of services there has been little change in the intervening period even though sex workers now work in a decriminalised environment. Similar to 1999, most participants positioned themselves as responsible in regularly attending a health service provider to have sexual health check-ups.

Only 3.7% of participants reported that they did not have regular sexual health check-ups in 2006/07 compared to 4% reporting this in the 1999 survey.³ There were also no significant differences in services accessed for sexual health needs between 2006/07 and 1999. GPs continue to be the preferred option for sexual health check-ups, followed by sexual health centres and then NZPC.

The stigma which continues to be attached to sex work means that many sex workers still do not disclose to health care providers that they are working in the sex industry. The 1999 survey reported that 52% did not disclose their occupation to the GP³ compared to 46% in 2006/07.

If sex workers are not disclosing their occupation to their GP they may not be getting the comprehensive check-up they would require. Many participants also do not disclose their occupation to family and friends which means that many are living double lives.^{8,9} Although the rights that sex workers now have under the PRA has given them some legitimacy and respectability,^{10,11} perceptions of stigmatisation has implications for their emotional⁸ as well as their sexual health.

It is interesting that most participants in the 1999 and 2006/07 surveys attended their GP service for sexual health check-ups when the literature suggests that health services run from sex workers' organisations are more acceptable to sex workers.^{5,12,13}

Sex workers' rights and grassroots organisations have become increasingly important in recent years, offering drop-in as well as community-based outreach options for the delivery of health services, condoms, emergency assistance, advice and health promotion messages to sex workers. Many combine with other agencies to work together to provide a more integrated, holistic service for sex workers.¹³ In so doing a wide variety of services can be offered, including housing, drug services and treatment, social services, sexual health and various support services.

NZPC has been effective in fulfilling this role in New Zealand since 1988. Yet whilst many sex workers in this study reported using the drop-in services NZPC provide, fewer reporting making use of the sexual health clinics held on their premises.

It would be beneficial to sex workers if they were able to make better use of NZPC for check-ups as these would be more thorough as disclosure is not an issue. However, clinics are only held on NZPC premises in the three main cities and these clinics do not provide adequate consultation hours.

The clinic at NZPC in Wellington opens for twice the length of time each week (six hours) as those in Auckland and Christchurch and has proportionally three times the number of sex workers accessing this service. If consultation hours were increased in all centres, it is likely that a greater proportion of sex workers would utilise this service.

Perhaps as time goes on, perceptions of stigma may change and sex workers will feel more confident in disclosing their occupation to their GP. Social perceptions of sex work do not change with a change in legislation. It is possible that it is too early to see any changes in perceived stigmatisation and this needs to be examined further down the track.

Competing interests: Nil.

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Outcomes in HrHPV-positive women with low grade cervical smears and normal or low grade initial colposcopy results

Erica Winsley, Dushyant Maharaj, Peter Abels, Diane Kenwright, Fali Langdana

Abstract

Aim To determine outcomes in HrHPV-positive women with low grade cervical smears and normal or low grade initial colposcopy biopsy results in a cohort of women over a 2-year follow-up period.

Background The revised National Cervical Screening (NCS) programme guidelines in New Zealand were implemented in October 2009. The guidelines state that women 30 years and older should undergo reflex HPV testing. If this test confirms the presence of HrHPV, women are to be referred for a colposcopic assessment. The guidelines do not mention what the follow-up period should be of women with HrHPV and normal or low grade abnormalities at colposcopy/biopsy.

Method In this study we followed up women 30 years and older referred to Wellington Hospital from 1/10/2009 to 1/10/2011 with a LGSIL or ASC-US smear and positive HrHPV test. Those with a normal or low grade biopsy result were followed over a 2-year period to determine outcomes.

Results Our study found that 4% of women with initial normal biopsy results and 15.2% with initial low grade results had progressed to high grade (CIN 2/3/invasion) over a 2-year follow-up period. During the same time period, 68% of women with an initial normal biopsy and 61% with a low grade biopsy had a normal colposcopy after 2 years. Twenty-eight percent of women with normal and 24% of those with initial with low grade biopsy continued to have LG abnormalities at 2 years of follow-up.

Conclusion Women 30 years and older who are HrHPV-positive and have low grade abnormalities at colposcopic biopsy may be followed up with a 12-month cervical smear rather than repeat colposcopy as the risk of progression to a high grade abnormality is low.

Genital human papillomavirus (HPV) infection is the most commonly diagnosed sexually transmitted infection in New Zealand.¹ Figures from the United States estimate that about 26.8% of women 14–59 years old are infected with the human papilloma virus,² with about a 75% lifetime risk of acquiring an HPV infection.³

HPV infection is now known to be a prerequisite for the development of cervical cancer,⁴ and virtually all cervical cancers are associated with persistent high-risk types of HPV (HrHPV) infection.⁵

More than 120 types of HPV have been identified,^{6,7} of which about 40 types can infect the genital tract.⁴ Of these, approximately 13 to 19 types are considered high risk, meaning that persistent infection with these types is associated with an increased risk of cervical, anogenital, and other cancers.⁸

HPV type 16, the most common HrHPV type, persists longer than other types and is especially carcinogenic. Persistent infection with HrHPV leads to the development of cervical intraepithelial neoplasia 3 (CIN 3) in about 40% of cases over 5 years.⁹

For a patient with cervical cytology abnormalities and a positive HrHPV DNA test result, ideal management must balance the need to identify and treat abnormalities that are likely to progress to invasive cancer, as opposed to the avoidance of unnecessary treatment related to transient HPV infection.¹⁰

The revised National Cervical Screening (NCS) programme guidelines in New Zealand was implemented in October 2009.¹¹ Management of women with a first low grade smear (low grade squamous intraepithelial lesion – LGSIL, or atypical squamous cells of undetermined significance – ASC-US) has significantly changed with the introduction of these guidelines.

The recommendation for women less than 30 years old with a first low grade smear is to undergo a repeat smear in 12 months, whereas women 30 years and older with a first low grade smear undergo reflex HPV testing. If this test confirms the presence of HrHPV, women are referred for a colposcopic assessment as progression of disease from low grade to high grade may be higher in this group.

High grade disease is treated according to the NCS guidelines;¹¹ in women with HrHPV and normal or low grade abnormalities at colposcopy/biopsy, the guidelines state that, “where findings on colposcopy/histology are negative or show low-grade changes only and the discordance persists following case review, HrHPV testing can be a useful adjunct to further management”.

The NCSP recommends a woman return to three-yearly screening only after two negative sets of HrHPV plus cytology tests 12 months apart.

We undertook this study to determine outcomes in HrHPV-positive women with low grade cervical smears and normal or low grade initial colposcopically directed biopsy results in a cohort of women over a 2-year follow-up period.

Material and Methods

From 1/10/2009 to 1/10/2011 we followed a cohort of 364 women 30 years and older who were referred to the colposcopy clinic at Wellington Hospital, New Zealand, with a LGSIL or ASC-US smear and positive HrHPV test who had diagnostic, colposcopically directed biopsies.

Women who had high grade smears at referral (CIN2 or CIN 3) or a cervical malignancy were excluded from the study as were women with a prior history of CIN2/3 or adenocarcinoma *in situ* (AIS), or if they had undergone a prior excisional/ablative procedure.

Those women who did not undergo a biopsy at a subsequent visit or for whom results were not available at follow-up visits were excluded from the study, as were women who were deemed to have had unsatisfactory biopsy results at the subsequent visits.

Based on history, all women were HIV negative and not on immunosuppressive medication. Women with a normal result (including a diagnosis of cervicitis or other non-neoplastic findings) or low grade abnormality (CIN 1, CIN 1/HPV) on biopsy were followed at a subsequent appointment and the second biopsy or treatment biopsy result was recorded. None of the 364 women were lost to follow up. Fifty eight women (23%) included in the study underwent a repeat biopsy. This included 25 women from the normal group and 33 women from the low grade group.

Women were assigned to two groups – those with a normal result and those with CIN 1/HPV on biopsy. Data on persistence of CIN 1/HPV, progression to CIN 2, CIN 3 or malignancy or regression to normal at 6 months, 12 months and 24 months were recorded and analysed to ascertain the percentage

of women with a positive HrHPV test and a subsequent normal or low grade abnormality on initial biopsy who had persistence, progression or regression of CIN or HPV effect on subsequent biopsies. The percentage figure for each group of women at each of the 3 time periods was calculated by using the number of women who at that time had had a follow up visit as the denominator. The time elapsed between the initial visit and the second visit was also recorded, and the median time for follow up for the three groups of women (normal, CIN 1 and CIN 1/HPV) was calculated.

Smear analysis employed liquid-based cytology, and the Abbott RealTime High Risk (HR) HPV assay ® and the COBAS 4800 platform® (Roche) were used to identify 14 types of HrHPV.

Results

Over the study period, 364 women 30 years and older were seen at the colposcopy clinic at Wellington Hospital, with a LGSIL smear and positive HrHPV test. Based on results from colposcopically directed biopsies 105 (29%) of these women had a normal biopsy, 146 (40%) had low grade biopsies (HPV, CIN 1 or CIN 1/HPV) and 113 (31%) were found to have high grade lesions on biopsy.

Fifty-eight women (23%) included in the study underwent a repeat colposcopy and subsequent biopsy. This included 25 women from the normal group and 33 women from the low grade group. The remaining 306 women who did not undergo a subsequent biopsy were discharged to community health practitioners for a repeat smear in 12 months.

The main results of the study are shown in Tables 1, 2 and 3 and in Figure 1 below.

Women in the normal and low grade groups showed equivalent clearance over follow-up at 6 months, 12 months and 24 months (Tables 1 and 2)

Table 1. Percentage of women in each group (initial normal, CIN1) who had a normal result at 6, 12 and 24 months

Variables	Initial normal (n=25)	Initial low grade (n=33)
% normal at 6months	75 (12/16)	53.3 (8/15)
% normal at 12 months	73.9 (17/23)	55.2 (16/29)
% normal at 24 months	68 (17/25)	60.6 (20/33)

Table 2. Percentage of women in each group who had a low grade [cervical smears] result at 6, 12 and 24 months

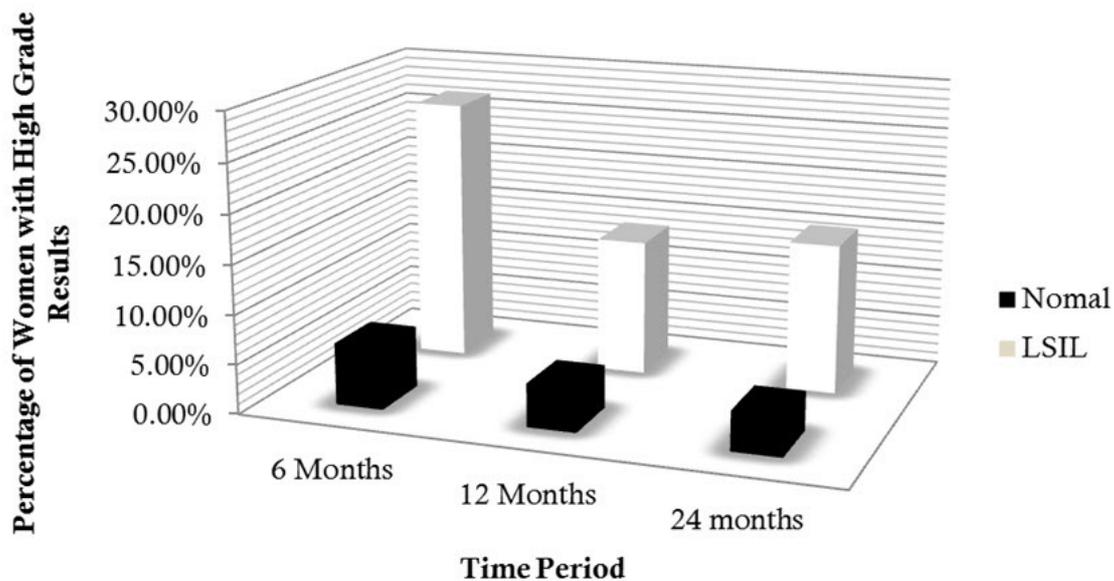
Variables	Normal (n=25)	Low grade (n=33)
% low grade at 6 months	18.8 (3/16)	20 (3/15)
% low grade at 12 months	21.7 (5/23)	31 (9/29)
% low grade at 24 months	28 (7/25)	24.2 (8/33)

Women in the low grade group showed greater progression to high grade disease at 6 months, 12 months and 24 months (Table 3).

Table 3. Percentage of women in each group who had a high grade [cervical smears] result at 6, 12 and 24 months

Variables	Normal (n=25)	Low grade (n=33)
% high grade at 6 months	6.3 (1/16)	26.7 (4/15)
% high grade at 12 months	4.4(1/23)	13.8 (4/29)
% high grade at 24 months	4 (1/25)	15.2 (5/33)

Figure 1. Percentage of women (y-axis) in each group (x-axis) who had a high grade result at 6 months, 12 months and 24 months (z-axis)



During the study period, 23% of women (n=58) referred to the colposcopy clinic with a HrHPV-positive result and LGSIL smear who had a normal or low grade initial biopsy had a follow-up colposcopy and repeat biopsy. These women were followed up at varying lengths of time, with the shortest follow up period of around 2 months (63 days), and the longest around 19 months (598 days), as a recommended follow up time was not specified in the NCS guidelines.

There was also a difference between median follow up times of the different groups, with women from the normal group being followed up after an average of 168 days or just under 6 months, and women from the low grade groups followed up at an average of 203 days or just over 6 months. This result seems unexpected, however it was not looked into further as there were no guidelines in place with which to compare results.

Discussion

Our study attempted to assess the persistence, regression and progression of normal and low grade abnormalities as determined by biopsy results in the presence of HrHPV at referral in an attempt to determine what the appropriate follow-up of these patients should be.

After 2 years, 4% of women with an initial normal biopsy result but HrHPV at referral had progressed to a high grade abnormality (CIN 2 or CIN 3). This result was similar to those published by Kelly et al,¹² where the cumulative rate of CIN 2 and higher was found to be 4.4% after 3 years in HrHPV-positive women with a normal colposcopy.

There were no women in the CIN 1 only group who had progressed to a high grade abnormality; however 25% (n=20) of women with an initial CIN 1/HPV result had progressed to a high grade abnormality. When the CIN 1 group and the CIN 1/HPV group, i.e. low grade were combined, this number decreased to 15.2%. This figure is higher than that of the 10% of women with an initial CIN 1 biopsy who progressed to CIN 3 in Ostör's study.¹³

Results from the ASCUS-LSIL Triage Study (ALTS)¹⁴ also indicate that the risk of developing CIN 3 within 2 years of a biopsy result < CIN 2 is around 12% in women who subsequently test positive for HrHPV.

The results of our study may be higher due to the limited sample size as well as HrHPV testing not being available in 1993 when Ostör published his work. Those women who test positive for HrHPV may be at higher risk for progression to high grade abnormalities,¹⁵ even with an initial result less than CIN 2. Another explanation may be that the endpoint for progression to high grade abnormalities in Ostör's study was CIN 3, whereas we considered high grade abnormalities to be CIN 2 or CIN 3 which may well have increased the number of women in this group.

The principle of equal management for equal risk may be invoked, but that requires a discussion of the risks of CIN2+ in other groups at 1 year following evaluation which is not the intention of this study.

It is important to note that no women from any of the three groups went on to develop invasive malignant disease within the two year period. In that time, 68% of the women with initially normal biopsies remained normal, 92.3% of women with initial CIN 1 biopsies, and 35% of women with initial CIN 1/HPV biopsies regressed to normal. When the low grade (CIN 1 and CIN 1/HPV) groups were combined, 60.6% regressed to normal over the 2-year period. This result was similar to those found by Kelly et al¹² and Ostör.¹³

Finally, it was found that 28% of women with initial normal biopsies at colposcopy progressed to CIN 1 or CIN 1/HPV over the 2-year period; women with an initial CIN 1 biopsy remained low grade over the same period.

In contrast, 40% of women with an initial CIN 1/HPV biopsy remained CIN 1/HPV or purely CIN 1 after 2 years. When the two latter groups (CIN 1/HPV and purely CIN 1) were combined, 24.2% of women remained the same after 2 years. This result differs from Ostör's study in which women with the same initial biopsy result had 30% persistence of CIN 1.¹³

Our study was limited to a 2-year period, starting in October 2009, as it was around this time that the reflex HPV test was introduced into the NCS programme as a way of triaging woman over the age of 30 with a LGSIL or ASC-US cervical smear and no abnormal smears in the previous 5 years.¹¹

Firstly, this limited the number of women who could be recruited for the study, and a further limiting factor became evident when it was realised that the majority of

women with an initial normal or low grade biopsy were not recalled for a subsequent colposcopy appointment and were discharged to their smear-takers. This was probably due to NCS guidelines not explicitly stating what the appropriate follow up should be for this group of women.

Secondly, it meant that we could only follow up women for a maximum of 2 years. Further research may be warranted to follow this group of women over a longer period of time to determine if there is a difference in outcomes.

Although it is difficult to draw a firm conclusion based on results from our study due to a limited sample size, it seems that of the HrHPV-positive women with an initial low grade biopsy result of CIN 1 or CIN 1/HPV, more regressed to normal over the two year period, while over the same time around 5% progressed to a high grade lesion and therefore less women than expected remained CIN 1 or CIN 1/HPV over the same time.

Over the study period, the majority of women with an initial normal result remained normal, although 28% progressed to a low grade lesion and a small number developed high grade abnormalities; this is consistent with other studies.^{12,13}

Conclusion

Women 30 years and older who are HrHPV-positive and have either normal or low grade abnormalities at colposcopic biopsy may be followed up with a 12-month cervical smear, as per current NCS guidelines, rather than a repeat colposcopy, as the rate of subsequent high grade CIN was sufficiently low to justify return to routine colposcopy recall.

The American Society of Colposcopy and Cervical Pathology in their guidelines state that women with a normal cytology and HrHPV-positive test could undergo either a repeat co-test in 12 months or immediate HPV genotype testing for HPV 16 or 16/18. If either the cotest or the HPV genotype specific test is positive, women should then be referred for colposcopy.¹⁶

Competing interests: Nil.

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Using triggers in primary care patient records to flag increased adverse event risk and measure patient safety at clinic level

Kyle S Eggleton, Susan M Dovey

Abstract

Aim Using triggers to identify adverse events is proposed as an efficient means of consistently measuring, and tracking events that result in harm to patients. We aimed to test whether using triggers in our large provincial general practice could provide meaningful directions for improving safety.

Method A literature review identified potential triggers and established the number of patients whose records we should review. Two teams independently reviewed 170 randomly selected patients' records for trigger presence and for evidence of harm relating to that trigger. All triggers were tested for sensitivity and specificity: triggers with low specificity were removed. Logistic regression was used on both initial and refined trigger sets to measure the odds ratio (OR) of harm occurring if a trigger was present.

Results Initially 36 triggers were identified. Applying these to 109.6 patient-years of records for 170 patients, we identified harm in the records of 46 (27.1%) patients. There were 7 occurrences of harm per 100 consultations (harm rate per consultation=0.07 (95% confidence interval [CI] 0.05–0.09) and 41 per 100 consulting patient years (95%CI 29–55). All harms related to medication use. The initial triggers were sensitive (0.98) but non-specific (0.08): removing triggers with low specificity left only 8. The OR for harm occurring using the initial triggers was 4.0 (95% 0.5-30) and using the refined trigger set OR=6.3 (95%CI 2.7–14.8).

Conclusion 8 selected triggers are a useful way of measuring progress towards safer care for patients in primary care practice.

Triggers of potential safety risks were reported in the anaesthesia literature 20 years ago.¹ Trigger tools are sets of easily identified flags, occurrences or prompts that alert reviewers to situations where harm is thought to be more likely than in routine care.²

Where there are electronic health records, applying both prospective and retrospective computer search algorithms for various triggers has been proposed as a method of identifying error and adverse events, especially in hospitals.³ Such searches provide a reasonably unbiased, systematic method of reviewing patient records to alert doctors and nurses to potentially risky situations and to provide measures of safety improvement as harm avoidance measures are implemented.

The usefulness of identifying harm is that processes and systems within practices that may lead or contribute to harm, can be analysed and changed, if we knew what they were. To be effective in this role, triggers should be sensitive (i.e. identify all occasions of the trigger event occurring) and specific (i.e. not identify situations that

seldom result in harm to patients). There are some reports of proposed triggers having sensitivity and specificity problems.⁴ This makes their use inefficient as on each occasion a trigger occurs, a manual review must be done to assess whether harm has occurred, and (if it has) its type and severity.

If the potential for harm associated with a trigger is seldom realised and the trigger identifies a common situation, the labour associated with reviewing “triggered” cases may be a cost that overwhelms possible benefits. Reports of trigger tools being tested in UK primary care practices show that it is possible to review up to 20 records in a 2–3 hour session, and that 8–12 triggers may provide optimal balance between sensitivity, specificity, and feasibility for using as a routine safety improvement tool.^{5–7}

Despite reports of the development of primary care trigger tools, little is yet known about the practicalities of using them in practice and in New Zealand there are no reports of their uptake. We could find no research showing the role of trigger tools in documenting the underlying harm arising from care provided in general practice settings. As a result it has been difficult to extrapolate these trigger tools to our clinical context, understand the proportion of harm that might be identified if we used one of the existing trigger tools, and inform our decisions about making our primary care safer for patients.

Because of the potential importance of triggers in protecting patient safety, we decided to test their use in a large general practice (>12,000 enrolled patients) situated in provincial New Zealand. The practice’s patients are mainly New Zealand European but Māori comprise 18% of its enrolled population. Its catchment includes both urban and rural areas.

We aimed to establish what trigger tool worked for us, which triggers were most useful, and whether we could derive a process that would be practical for us to use routinely.

Methods

Possible triggers were identified from reviewing the literature of triggers tested in primary care and a focus group of two general practitioners, two pharmacists and one practice nurse decided on the 36 triggers for initial use (Table 1). The focus group was facilitated by the local Primary Healthcare Organisation’s (PHO’s) quality improvement leader. In New Zealand, PHOs are responsible for the funding, quality improvement and clinical governance of primary care.

We calculated that we needed to review the records of 170 patients, based on an assumption that the background harm rate in primary care is 5% and with 90% power to detect harm. To be included in the review, patients had to be registered with the practice for ≥ 12 months and have at least one visit with a general practitioner in 2011. We decided to include all ages in the cohort (other studies of primary care trigger tools had excluded children) and that 50% of reviews would be of Māori patients’ records. Records were reviewed from patients randomly selected from the practice’s January 2011 patient register.

The trigger tool was applied by two teams of reviewers. One team consisted of a general practitioner and a community pharmacist and the other team was a general practitioner and a practice nurse. The teams separately reviewed each patient record for the presence of a trigger. If one was present, indication of harm relating to that trigger was then sought.

Table 1. The initial trigger tool and source

No.	Trigger	Source
1	Adverse reaction recorded	de Wet ⁷
2	Address of a residential facility	Consensus
3	Home visit=de Wet	de Wet ⁷
4	>2 consults in a week	Derived from de Wet (>3 consults) ⁷
5	>12 consults per year	Derived from de Wet (>10 consults) ⁷
6	>3 consults with different GPs in a 3-month period	Consensus
7	Predominant provider and nominated provider are different	Consensus
8	No appointment & repeat Rx (repeat of previous medication)	Consensus
9	No appointment & telephone Rx (medication not had previously)	Consensus
10	Long-term medications and classifications are at variance	Consensus
11	Diagnosis of cancer in the last 12 months	Derived from de Wet (high priority READ code) ⁷
12	Cessation of medications	Singh ⁶
13	>6 medications prescribed (at the same time)	Consensus
14	Change of medications	de Wet ⁷
15	Reduction in medication dose	de Wet ⁷
16	Hospital discharge – including ED and day stay	de Wet ⁷
17	ED/A&M clinic after GP consult within 2 weeks	derived from Singh ⁶ and de Wet ⁷
18	ED/A&M clinic after GP consult within 2 weeks prior to GP consult within 2 weeks	de rived from Singh ⁶ and de Wet ⁷
19	ED/A&M clinic after nurse consult within 2 weeks	derived from Singh ⁶ and de Wet ⁷
20	ED/A&M clinic prior to nurse consult within 2 weeks	derived from Singh ⁶ and de Wet ⁷
21	Hospital admission with no GP consult within 6 months	Singh and de Wet ⁷
22	Attended outpatient clinic, including radiology, hospital clinics, physiotherapy & private specialists	de Wet ⁷
23	INR (5+)	Singh ⁶
24	Histology	Consensus
25	Abnormal gynaecology cytology	Consensus
Lab results		Source
26	eGFR <35 mL/min/1.73m ²	derived from Singh ⁶
27	TSH <0.03 on thyroxine)	Singh ⁶
28	Carbamazepine (Tegretol) >40 µmol/L	Singh ⁶
29	Digoxin (Lanoxin) >2 nmol/L	Singh ⁶
30	Phenytoin >80 µmol/L	Singh ⁶
31	Theophylline >110 µmol/L	Singh ⁶
32	Valproic acid >700 µmol/L	Singh ⁶
33	Lithium >1.5 mmol/L	Consensus
34	Short-term admission to residential aged care facility	Consensus
35	Death	Singh ⁶
36	Medication list not complete	Consensus

Rx=prescription.

ED=Emergency department.

A&M=Accident and medical.

eGFR=Estimated glomerular filtration rate.

INR=International normalised ratio.

TSH=Thyroid stimulating hormone.

Each record was then reviewed for the presence of any harm that was not related to the trigger. Harm was defined according to the Medication Error Index adopted by the National Coordinating Council for Medication Error Reporting and Prevention.⁸

Harm was classified according to the WHO National Coordinating Council for Medication Error Reporting.⁸ Following each session a reconciliation of findings between teams ensured consistency of interpretation of triggers and harm. If there was a difference between the two teams then a decision was made based on consensus.

The analytic plan was first to measure the harm events associated with each trigger and calculate the sensitivity and specificity of each trigger. We then carried out logistic regression analyses, adjusting for sex, ethnicity and age to estimate the odds of harm associated with each trigger and with the 36 triggers combined.

Using a consensus approach between members of the research team, triggers with the lowest specificity were then excluded and a refined trigger tool derived and tested for its ability to identify harm, using a further age-sex-ethnicity-adjusted logistic regression analysis.

The study was reviewed and approved by the Northern X Ethics Committee (NTX/11/EXP/298).

Results

The records of 170 patients were analysed for both the presence of a defined trigger and the presence of harm – see Table 2 for demographics and Figure 1 for a flow chart of the analysis process and results. Thirteen patients had no trigger in their records.

Table 2. Demography of patients whose records were reviewed

Variables	Male	Female	Total
Age (years)			
<18	24	17	41
18–65	37	55	92
≥65	17	20	37
Māori	44	41	85
Non–Māori	34	51	85
Total	78	92	170

A total of 1033 triggers were identified over a total of 40,030 days of follow-up in which 637 consultations were recorded. In these consultations, 44 harms were picked up by 62 triggers and 1 harm was not picked up by any triggers. All harms identified were medication related.

Figure 1. Flowchart of analysis and results

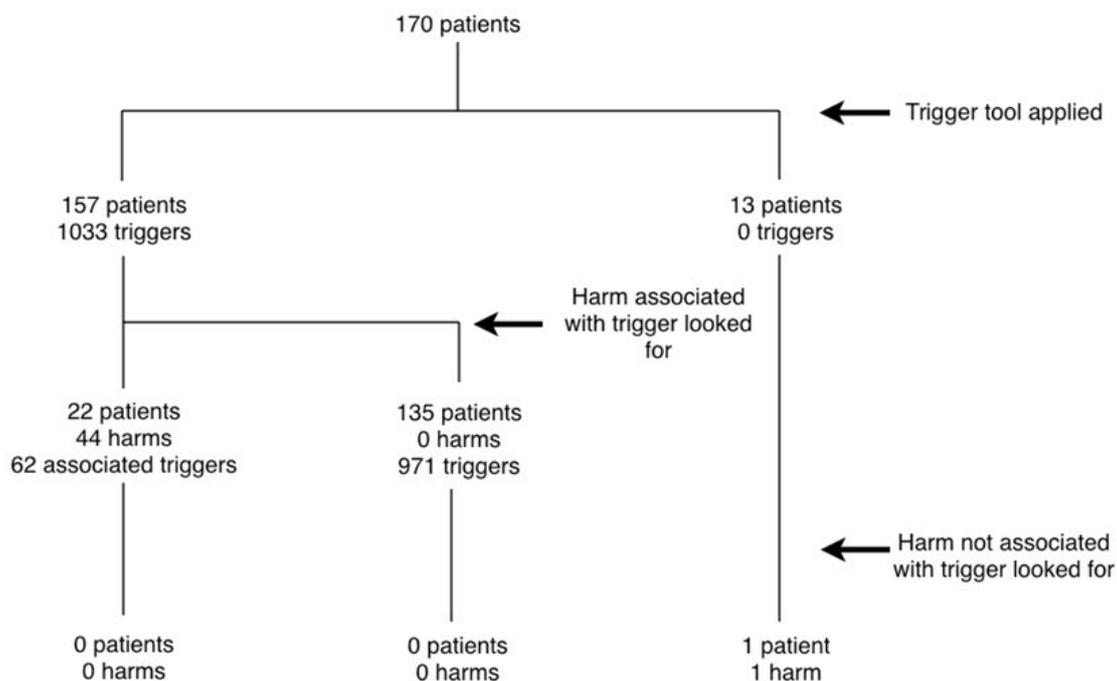


Table 3 lists triggers associated with harm. The rate of harm per consultation was 0.07 (95%CI 0.05–0.09) or 7 occurrences of harm per 100 consultations. The rate of harm per 100 patient years was 41 (95%CI 29–55).

Of the 45 occurrences of harm:

- 34 (76%) were classified as Category E – temporary harm to the patient and required intervention;
- 8 (18%) were classified as Category F – temporary harm to the patient and required initial or prolonged hospitalisation;
- 2 (4%) were classified as Category G – permanent patient harm; and
- 1 (2%) were classified as Category I – patient death.

The odds ratio of harm occurring using 36 triggers was 0.78 (95%CI 0.5–30) with a sensitivity of 0.98 and a specificity of 0.08.

The refined primary care trigger tool included only 8 triggers: adverse drug reaction documented in the record, ≥ 2 consultations with a GP in the same practice in a week, cessation of medication, reduction in medication dose, ≥ 6 medications prescribed, attending the emergency department or an after hours provider within 2 weeks of having seen a GP, eGFR < 35 , and death.

The odds ratio of harm occurring if one of the reduced set of triggers was present was 3.4 (95% confidence interval 1.7–7.1) when adjusted for age, sex and ethnicity. The sensitivity of this refined trigger tool was 0.81 and the specificity was 0.51. The odds

ratio for harm occurring among male patients was 0.59 (0.32–1.10) and for Māori was 0.96 (0.48–1.93). The correlation coefficient for the refined primary care trigger tool, was 0.4 between the two groups of reviewers.

Table 3. Number of consultations with a trigger and number (percentage) associated with harm)

Trigger	Number of consultations with triggers	Number (%) of triggers associated with harm
Adverse reaction	18	15 (83.3)
≥2 consultations in a week	27	2 (7.4)
Telephone prescription for new medication and no appointment	40	1 (2.5)
Cessation of medication	45	19 (42.2)
≥6 medications prescribed	38	1 (2.6)
Change of medication	25	6 (24.0)
Reduction in medication dose	17	6 (35.3)
Hospital discharge	67	4 (6.0)
Accident and medical clinic or emergency department after GP consultation within 2 weeks	18	2 (11.1)
Attended outpatient clinic	266	5 (1.9)
Estimated glomerular filtration rate <35 mL/min/1.73m ²	5	2 (40.0)
Death	1	1 (100.0)

Discussion

In this study we showed that 27.1% of the study sample of 170 patients experienced at least one of the 36 triggers we identified from the literature, within the time their electronic records were held by the study general practice. The only other study we could find using a random sample of patients found a slightly smaller proportion (21.1%) experiencing some sort of safety incident (not necessarily associated with harm).⁹

The per consultation rate of harm we found (0.07 per consultation) is comparable to other reported rates of harm of 0.1 per consultation. The main type of harm in this cohort was adverse events from medications which are often an expected occurrence. Most harm was minor and temporary.

The refined primary care trigger tool we developed is a compromise between reaching high sensitivity and making the tool practical to use in primary care by limiting the triggers to those that have high specificity. The final list of 8 triggers balances practical considerations (not being too arduous to use when reviewing patient records) and providing some assurance that most harm will be identified. It is possible that a different practice population may have a different set of triggers and further work is needed to confirm the validity of the 8 triggers we finally arrived at.

There was relatively low correlation between decisions made by the two sets of reviewers. This can be explained in a number of ways. First, there was no training on reviewing the record for triggers. This is mainly because trigger tool use in general practice is a novel concept in New Zealand and there has been no previous work to

enable training. Essentially the training occurred “on-the-job”. Second, during the process of developing consensus between the two groups, it became apparent that the triggers lacked a tight definition. This resulted in each group having a different concept of what was a trigger and what was not. As a result, different triggers were identified. Thirdly, the makeup of the two groups of reviewers differed. The group that included a pharmacist picked up more triggers relating to medication (adverse reaction, cessation of medications, change of medication and reduction of medication).

All of these factors resulted in the groups identifying different patient records with triggers. To improve validity we recommend that triggers are well defined, that training occurs for reviewers (by attending workshops run by quality and safety organisations such as the New Zealand Health, Quality and Safety Commission) and that consideration is given to composition of the review team.

Previous papers, on primary care trigger tools, have used similar methods with the exception of looking for the occurrence of harm when a trigger is absent, as was done in this study.⁵⁻⁷ Although only one harm was identified that was not associated with a trigger the actual harm may be higher as the study protocol excluded more subjective harm that might have arisen from delayed diagnosis. In addition harm rates might be under-represented in the number of patients selected as other papers have had greater numbers of patients reviewed.⁵⁻⁷ Further research would therefore be required on a larger population.

This study was designed to inform the researchers about measurable harm relating to triggers that have already been proposed by international researchers. However, in the process of examining the randomly selected electronic records, we also identified errors in the process of care that probably also resulted in patient harm, undocumented in the records. These errors included problems with telephone prescriptions that obviously resulted in financial and time costs to patients but were due to the practice’s internal systems, poor continuity of care as patients moved through different care settings, and failure to document received care in the appropriate place in the record. The one death in this study was due to an inadvertent failure to continue a medication that had been initiated in hospital.

In summary the final 8-trigger trigger tool shows promise as a practical mechanism to identify harm in general practice although the time this review takes means that only a small subset of the patient records for each practice can be reviewed. Our sample provided generalisable information for our practice but the relatively small sample size combined with the low correlation between reviewers, means that inter-practice comparison of harm would be invalid.

The primary care trigger tool offers an opportunity for pharmacists, nurses and other primary care providers to work collaboratively with general practitioners and could initiate further work on medication reconciliation and better defining the roles of different health professionals working in general practice.

Further study is required on the primary care trigger tool to assess the generalisability across other practices and to determine what quality improvement initiatives occur within practices as a result of using this tool.

Competing interests: Nil.

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Work status and disability trajectories over 12 months after injury among workers in New Zealand

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Abstract

Aim To describe work and disability trajectories over 12 months following injury among workers.

Methods Workers injured at work or elsewhere (n=2626) were sourced from the Prospective Outcomes of Injury Study, a longitudinal cohort study in New Zealand, with the primary objective of identifying factors associated with disability following injury. Work and disability status was assessed at 3- and 12-months post injury. The measure of disability was the brief WHODAS II 12-item instrument. Participants were dichotomised into 'disability' or 'no disability' groups based on whether their WHODAS score was greater than, or equal to, 10. In terms of 12-month work status, there are 16 different scenarios. These were grouped into 4 categories: sustained work (SW), delayed return to work (RTW), non-sustained RTW, and sustained off-work.

Results We had complete information for 1975 workers. The largest group (68%) was SW, 32% of which had disability at either time point. The second largest group consisted of 17% of workers who were classified as delayed RTW, 76% of whom were disabled at either time point. Among the non-sustained RTW group (7%), 52% had disability at either time point. Of the sustained off-work group (8%), 80% were disabled at either 3- or 12-months.

Conclusion Although return to work is a useful provider performance indicator of injury compensation and rehabilitation it is inadequate from a wider societal perspective and needs to be complemented by other important outcome measures such as disability status.

Return to work (RTW) is a key performance indicator for workers compensation systems. However, most RTW measures rely on claim-based information. From a wider societal perspective this performance measure needs to be complemented with other measures as RTW does not necessarily mean that a person has returned to his or her pre-injury work disability status.¹ Moreover, even if that were the case the worker may continue to have non-work disability.

In response to this situation, measurement of RTW outcomes beyond claim closure was adopted by Australian Workers' Compensation agencies. The RTW Monitor (RTWM) provides the RTW measures for the comparative performance monitoring of Australasian compensation agencies.²

RTWM reports the results of a survey of injured workers who have been paid 10 or more days' compensation and submitted a claim 7 to 9 months prior to the survey date. In addition to providing information on work status at the time of the survey,

information is also provided on the reasons for return (e.g. recovered from injury, economic need) or non-return to work (e.g. still injured, left employment).

Although this information provides a useful complement to a claims-based RTW performance measure, it has some significant shortcomings. First, it provides no longitudinal perspective. For example, an injured worker may have an early RTW but may have difficulty coping with the demands of the job and subsequently cease working. Second, there is no measure of disability status other than the respondent simply advising whether or not they were still injured.

It should also be noted that RTWM restricts its analyses to work-related injury as it only compares workers compensation agency performance. This is a shortcoming in the context of more comprehensive compensation schemes, such as that in New Zealand (NZ) where non-work injury can result in time off work and also incurs support costs from NZ's no-fault accident insurer—the Accident Compensation Corporation (ACC). The ACC manages NZ's comprehensive 'no-fault scheme' which provides rehabilitation and compensation services for all New Zealanders regardless of the cause of injury (e.g. work, recreational, domestic duties) and whether one is working or not.³

The work of Baldwin and others, based on Ontario workers, represents the only published study providing empirical evidence of the inadequacy of RTW as a measure of outcomes of health care.⁴ They demonstrated that RTW used as a measure of effectiveness of health care is misleading as: (1) that RTW is influenced by factors not directly related to health care and (2) the RTW measures do not account for multiple episodes of work disability.

The aim of this paper is to describe work and disability trajectories over 12 months following injury among injured NZ workers.

Methods

Study participants—We sourced injured workers from the Prospective Outcomes of Injury Study (POIS), a longitudinal cohort study with the primary objective of identifying factors associated with disability following injury.^{5,6} The POIS cohort consists of 2856 participants who were recruited from people in NZ aged 18–64 years (inclusive) who had sought treatment for acute injury and who required assistance (e.g. wage compensation, physiotherapy) from ACC beyond the initial visit to a healthcare provider.

Our investigation was restricted to cohort members who were workforce active at the time of their injury. A cohort member was considered workforce active if they were an employee working full-time or part-time for wages, were self-employed, or were an employer at the time of injury (n=2626).

In NZ people who are work active at the time of their injury and considered to need time off work to recover from their injury are entitled to receive up to 80% of their pre-incapacity weekly earnings, irrespective of whether the injury event was work related or not. Workers were included in this investigation irrespective of whether the injury was work related or not.

Outcomes—Work status at 3-months was ascertained at the 3-month assessment with the single question “Are you back at work following your injury?” with dichotomised responses “yes” and “no”. Work status at 12-months was ascertained at the 12-month assessment using the single question “Which of the following best describes your paid work situation now?”, with participants indicating “full time” and “part-time work for pay” considered to be working, and those responding receiving a “benefit and/or ACC compensation” or indicating “unemployment” considered to be “absent from work”.

The measure of disability was the brief World Health Organization Disability Assessment Schedule (WHODAS II) 12-item instrument.⁷ This assesses activity limitations and participation restrictions over

the past 30 days along six dimensions (understanding and communication, self-care, mobility, interpersonal relationships, work and household roles, and community roles), based on 12 questions. Each of the 12 questions has five difficulty-level response options: “None=0, Mild=1, Moderate=2, Severe=3 or Extreme/Cannot do=4”. The 12 response scores were summed using the simple-summed approach to provide a total score with a possible range from 0 (no disability) to 48 (maximum disability).⁸ Participants missing a response to one of the 12 items had their average score, from the 11 completed responses, imputed for the missing response; if more than one response was missing, the participant’s scores were not summed for analysis.⁸

Participants were asked to report WHODAS status in the 30 days before the 3-and 12-month interviews. Participants were dichotomised into a ‘disability’ group if their WHODAS score was ≥ 10 , and a ‘no disability’ group if their score was < 10 .⁸

Ethics—Ethical approval for POIS was obtained from the New Zealand Health and Disability Multi-region Ethics Committee (MEC/07/07/093). Following feedback from participants in the pilot study, and with the approval of the Ethics Committee, to be inclusive of all people (including those with poor vision or limited literacy), all participants granted oral consent to participate after receiving comprehensive information about the study. Oral consent was then documented by interviewers into the electronic computer system, and all participants received copies of the consent form.

Results

We identified 2626 study participants who met the definition of being a worker at the time of their injury. The results are confined to the 1975 workers for whom we had disability and work status information at both 3- and 12-month assessments.

Table 1 provides a summary of key sociodemographic characteristics of the study sample. Figure 1 shows work and disability status trajectories of these workers at 3- and 12- months. In terms of 12-month work status there are 16 different scenarios. Below we describe four groupings in terms of their self-reported work status.

Figure 1. Work status and disability trajectories

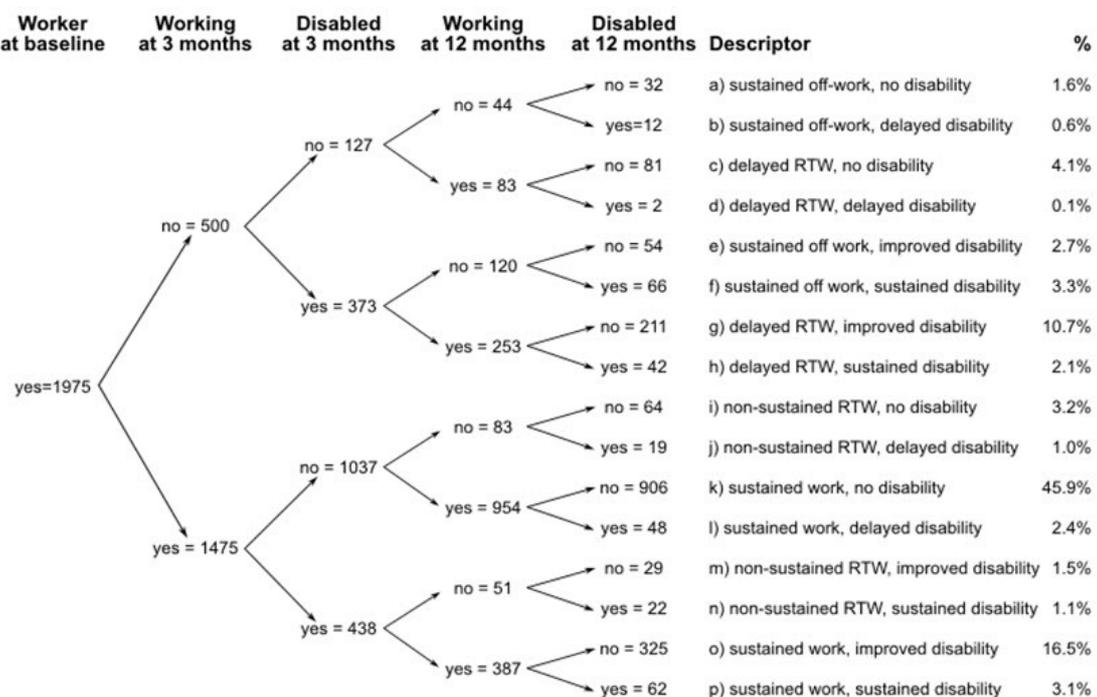


Table 1. Sociodemographic characteristics of 1975 workers for whom disability and work status information was available at both 3- and 12-month assessments

Characteristics	n	%
Age		
18–24	203	10
25–34	397	20
35–44	458	23
45–54	534	27
55–64	383	19
Sex		
male	1217	62
female	758	38
Māori ethnicity#		
no	1617	82
yes	356	18
missing	2	0
Pacific ethnicity#		
no	1843	93
yes	130	7
missing	2	0
NZ European#		
no	537	27
yes	1436	73
missing	2	0
Highest educational qualification		
post secondary school	1195	60
secondary school	472	24
no qualification	293	15
missing	16	1
Occupation		
professional	738	37
semi-professional/technical	416	21
trade/manual	756	38
unclassifiable worker	57	3
missing	8	0
Living arrangements		
with family	1637	83
with nonfamily	138	7
alone	194	10
missing	6	0
Preinjury household income		
adequate*	1809	92
inadequate	158	8
missing	8	0

Multiple ethnicities possible.

* Includes just enough/enough/more than enough.

Sustained working (working at both 3- and 12- months)—68% (n=1341) of the workers were at work at both 3 and 12 months [hereafter referred to as sustained working (SW) Fig 1: k)+l)+o)+p)]. It should be noted that there were 160 in the SW group who did not have time off work immediately following their injury.

With regards to disability among the SW sub-group, 68% (n=906) were not disabled at either time point. In contrast, 5% (n=62) of this sub-group were disabled at both time points (hereafter referred to as sustained disability). A further 24% (n=325) were disabled at 3 months but not 12 months (hereafter referred to as improved disability). Conversely, an additional 4% (n=48) while not disabled at 3-months had become so at 12-months (hereafter referred to as delayed-onset disability).

Delayed return to work (not working at 3-months, working at 12-months)—17% [n=337, Fig 1: c)+d)+g)+h)] of the workers were not working at 3-months but were working at 12-months (hereafter referred to as the delayed RTW). Of this delayed RTW sub-group, 24% (n=81) had no disability at either time point, 63% (n=211) had improved disability, 12% (n=42) had sustained disability and less than 1% had delayed-onset disability.

Non-sustained RTW (working at 3-months, not working at 12-months)—Seven percent (n=134, Fig1: i)+j)+m)+n)) of workers at 3-months were not working at 12-months (hereafter referred to as non-sustained RTW). With regards to disability status of workers with non-sustained RTW, 48% (n=64) of this sub-group had no disability at both time points, 15% (n=19) delayed-onset disability, 22% (n=29) improved disability, and 16% (n=22) sustained disability.

Sustained off-work (not working at both 3 and 12 months)—Eight percent [n=164, Fig 1: a)+b)+e)+f)] of the workers were not working at both 3- and 12-months (hereafter referred to as sustained off-work). Twenty percent (n=32) of this sub-group was not disabled at either time point, 7% (n=12) had delayed-onset disability, 33% (n=54) had improved disability and 40% (n=66) sustained disability.

Overall, the three most common trajectories were sustained working and no disability at 3- or 12- months (46%), sustained working with delayed-onset disability at 12-months (17%), and delayed RTW at 12 months but no disability once returned to work (11%). The prevalences for the remaining 13 scenarios did not exceed 4%. The concordance between work and disability status was poor (3 months: K=0.37, 6 months K=0.32).

Discussion

The results support our earlier criticisms of RTW as isolated measures of outcome following injury in several ways and are consistent with the only broadly comparable study published to date.⁴

First, we have found poor concordance between work and disability status. This is well illustrated by our largest group, the SW group, 24% of whom had a disability at 3-months.

Second, the value of repeated measurement overtime is illustrated by our finding that workers' disability and work status can change. For example, our results show that 17% of the cohort of injured workers were not working at 3-months but were so at 12-months (i.e. our delayed RTW group).

In addition to providing a complementary measure to RTW, measuring disability provides a potential explanation of why workers have or have not returned to work. For example, 80% of our sustained off-work group had a disability at 3 or 12 months.

Stories of injured people defrauding compensation systems by lying about their disability status receives occasional media and political attention. Of note in this respect only 2% of participants were classified as sustained off-work and also reporting no disability (i.e. WHODAS \leq 10) at 3- or 12- months.

Caution needs to be exercised interpreting various trajectories we have presented. For example, someone who was classified as sustained working and sustained disability may match one of many profiles, including but not limited to: 1) someone whose disability has stabilised, or 2) someone who has prematurely, in terms of optimal rehabilitation, returned to work for economic reasons, or 3) someone who has returned to work with a disability as this was considered by all parties as being facilitative of their rehabilitation. This would include some of the 160 workers in the present study who self-reported that they initially had no time off work.

Further insight into the various scenarios as well as factors associated with them is beyond the scope of the present investigation. One significant restriction for any future analytical investigation using the present cohort would be the small numbers associated with the majority of the 16 scenarios.

This investigation has some limitations. We dichotomised participants as being disabled or not according to a recognised threshold on the WHODAS. It is important to emphasise that those we classified as not disabled did not meet the threshold; this is not to say they were not exhibiting some degree of disability.

Similarly, our use of the term “sustained” relates to two points in time. For example we did not ask at the 12-month interview whether they had been working over the entire period between the 3- and 12-month interviews. We identified 16 unique trajectories, a significant proportion had a small number of study participants. Consequently, caution should be exercised in making comparisons between the relative sizes of the trajectories.

Another limitation to our investigation is missing cases, and the potential bias this may have introduced to our estimates. We excluded 651 workers (25% of eligible cases) because we did not have disability or work status information at 3- or 12-months. We subsequently determined in additional analyses (results not presented) that work status at 3-months was not associated with participation in the study at 12-months. Independently of that analysis, for the entire cohort (n=2856) we have established that risk of non-participation at 12-months is elevated only for those with a WHODAS score \geq 24.⁹

Our measures of work status at 3- and 12- month were not the same. It may be possible for some participants to answer each question differently, thereby raising the possibility of misclassification bias, although this is likely to be very small.

The study has a number of strengths. First, disability status was assessed by university researchers independently of ACC, and study members were assured that the information they provided would remain confidential to the researchers. Second, we used validated measure of disability. Third, by examining work and disability status at two time points we have provided a unique longitudinal insight to work and disability trajectories over time. Fourth, New Zealand’s comprehensive no-fault accident compensation scheme has allowed us to consider work and disability outcomes for all injured workers, irrespective of whether their injury was work related or not.

This is important because work being off work is costly for the worker irrespective of how the injury occurred. It is also costly for countries or states that have injury compensation schemes to cover non-work related injuries, most notably injuries arising from motor vehicle crashes.

It should be noted that since POIS is not a representative cohort, the sub-sample of workers from the cohort that we have studied is not necessarily representative of all workers requiring ongoing assistance from ACC. Nevertheless they provide unique, independent, objective and complementary insight to the monitoring of rehabilitation performance.

Conclusion

Although measures of RTW are useful performance indicators for injury compensation and rehabilitation schemes, they are inadequate from a wider societal perspective. In order to capture broader functional and disability outcomes in workers, return to work measures need to be complemented by other measures such as disability status.

The adoption of measures of disability as performance indicators by those managing compensation schemes would allow for a more accurate appraisal of scheme performance which is likely to stimulate improvement in rehabilitation services and outcomes for injured workers.

Competing interests: Nil.

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Acute liver dysfunction as a presentation of haemophagocytic lymphohistiocytosis

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Abstract

Haemophagocytic lymphohistiocytosis (HLH) is an uncommon disorder of histiocyte function which presents with fever, cytopenias and end-organ dysfunction. We report the case of a 62-year-old man with acute liver dysfunction as an initial presentation of HLH.

Haemophagocytic lymphohistiocytosis (HLH) is characterised by excessive macrophage activation resulting in multiple organ damage. It should be considered in patients with pyrexia of unknown aetiology, cytopenias and evidence of end-organ (especially liver) dysfunction.

Case report

A 62-year-old gentleman with ulcerative colitis diagnosed at age 31 (quiescent and not on treatment at time of presentation) and Barrett's oesophagus presented with 2 months of fever, fatigue and weight loss. His liver edge was 2 cm below the costal margin, with no lymphadenopathy or splenomegaly.

Over 4 weeks he had developed marked liver dysfunction (albumin 21 g/L; INR 1.3; bilirubin 95 $\mu\text{mol/L}$; ALP 283 U/L; GGT 358 U/L; ALT 62 U/L; AST 134 U/L) and pancytopenia. Ferritin, triglycerides, vitamin B12 and folate were initially normal.

Initial bone marrow aspirate and trephine examination showed a normocellular bone marrow with infrequent haemophagocytosis. Autoimmune screen (antinuclear antibody, rheumatoid factor, anti-CCP, anti-Ro, anti-La, smooth muscle antibodies, parietal cell antibodies and antimitochondrial antibodies) was unremarkable apart from a positive antinuclear cytoplasmic antibody (ANCA) (normal MPO and PR3 levels). EBV, CMV and hepatitis A, B and C were negative.

Abdominal ultrasound and magnetic resonance cholangio-pancreatography were unremarkable. CT abdomen showed no lymphadenopathy or intra-abdominal malignancy.

Given progressive liver dysfunction and cytopenias, bone marrow aspirate and trephine biopsy were repeated 2 weeks after the initial biopsy, this time showing haemophagocytosis (Figures 1 & 2).

Liver biopsy revealed sinusoidal congestion with haemophagocytosis (Figure 3). Ferritin was now 1047 $\mu\text{g/L}$ (2–500 $\mu\text{g/L}$) and triglycerides were elevated (6.1 mmol/L), thus fulfilling the HLH-2004 diagnostic criteria.¹

Treatment was started according to the HLH-2004 protocol (dexamethasone, cyclosporin, etoposide and intrathecal methotrexate) resulting in normalisation of all parameters.¹ The patient is now asymptomatic and off treatment 18 months after diagnosis.

Figure 1. May-Grunwald-Giemsa stain of bone marrow aspirate showing red cell (red arrow) phagocytosis by a macrophage (black arrow). Magnification: 200×

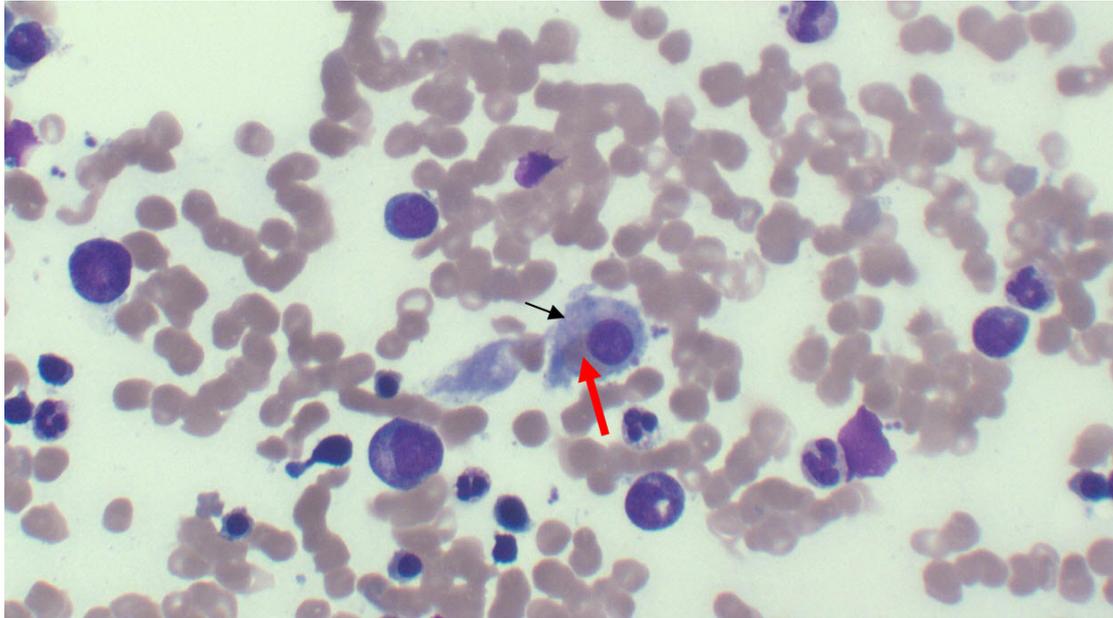


Figure 2. Haematoxylin & Eosin stain of liver biopsy showing macrophages ingesting red cells (black arrows). Magnification: 200×

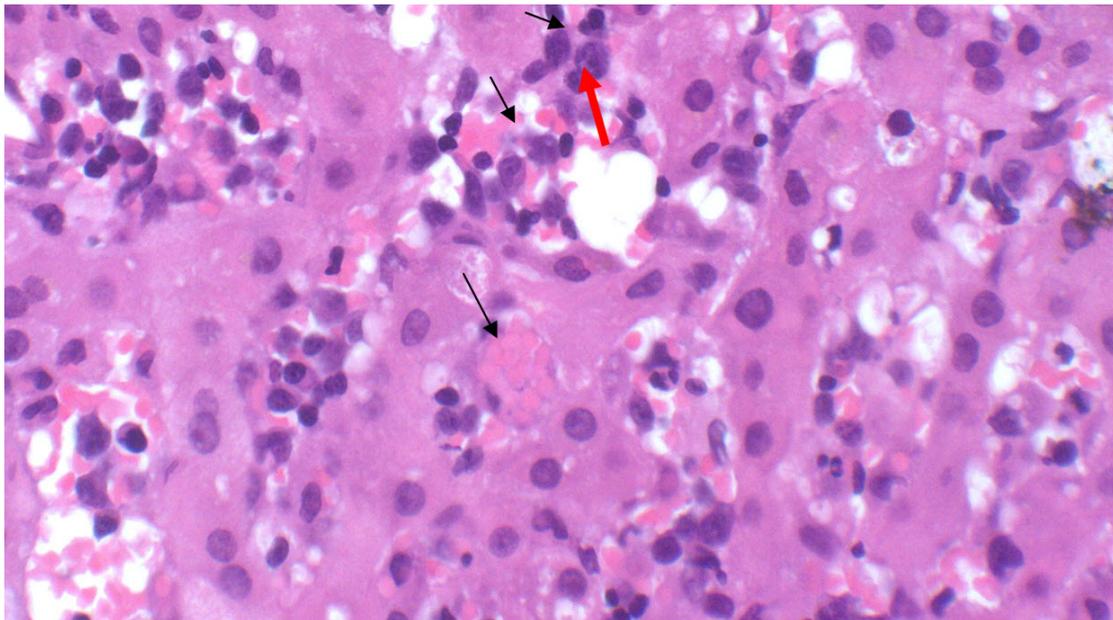
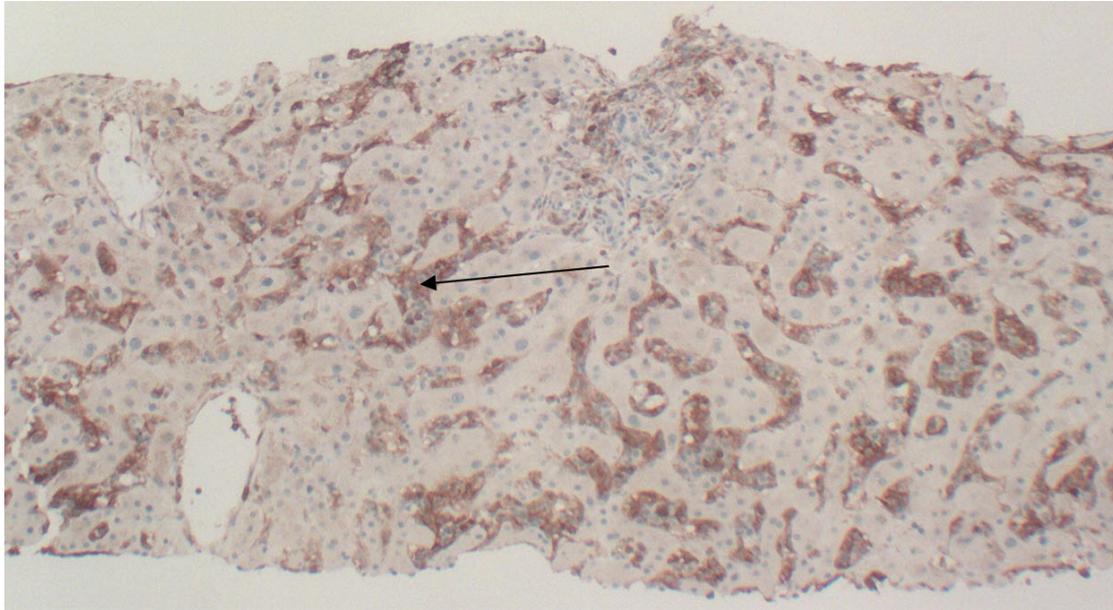


Figure 3. Immunohistochemistry slide of liver biopsy stained with CD68 showing histiocyte distribution within sinusoids (black arrow). Magnification: 40×



Discussion

HLH is a histiocytic disorder characterised by an inappropriate response to antigens. Incidence is estimated at 1.2 cases per million per year.² Pathophysiology involves defective perforin-mediated cytotoxic pathways of CD8+ and Natural Killer (NK) cells.³

Inability of these cells to eliminate antigens and provide negative feedback causes uncontrolled proliferation of T cells and macrophages resulting in a cytokine storm accounting for the clinical presentation.³

HLH has both primary (genetic disorders in the perforin-mediated cytotoxic pathways) and secondary (no identifiable genetic predisposition) forms, which are triggered in susceptible individuals by infections, autoimmune conditions and malignancies. Primary forms almost always present before 1 year of age and without treatment are universally fatal.⁴

Lymphohistiocytic proliferation can occur in any organ, with the liver being most commonly affected organ.⁵ The diagnosis should be considered in any patients presenting with liver dysfunction with other suggestive features. Fever, cytopenias and hepatosplenomegaly are the cardinal features of HLH. Characteristic laboratory findings include bi- or pancytopenia, elevated ferritin, triglycerides, bilirubin, transaminases and low fibrinogen, but as seen in our case, these may be normal in early stages.³

Fever is caused by high levels of interleukin (IL)-1, interleukin (IL)-6 and tumour necrosis factor (TNF)-alpha.³ Cytopenias are attributed to both haemophagocytosis

and high concentrations of TNF-alpha and interferon (IFN)-gamma.³ Increased levels of TNF-alpha downregulates lipoprotein lipase resulting in hypertriglyceridaemia.³

The characteristically high ferritin is a result of secretion by activated macrophages, but may be normal in early presentations.³ Hepatosplenomegaly, liver dysfunction and CNS signs are attributed to end-organ infiltration.³

Diagnosis is difficult due to the overlap of clinical features with sepsis/ multi-organ dysfunction. The Histiocyte Society has produced the HLH-2004 criteria but these are not 100% specific.¹ A ferritin level over 10,000µg/L and elevated serum CD25 are relatively specific markers for the condition.⁶

Once diagnosed, testing for underlying genetic mutations (in the case of primary HLH-usually in infancy) and for secondary causes of the disorder (in adult presentations) should be considered.

Therapy consists of immunosuppression and/or chemotherapy to control the activated macrophages and lymphocytes. Most centres follow the HLH-2004 protocol which involves high dose dexamethasone, etoposide and cyclosporine A ± intrathecal methotrexate.¹ Patients with primary HLH will relapse following this treatment and need to proceed to haematopoietic stem cell transplant (HSCT) to achieve cure.⁷

Patients with secondary HLH should be followed closely looking for relapse.⁸ Relapsed HLH should be considered for HSCT or further immunosuppressive treatment (the exact nature of which remains a matter of considerable debate).⁸

Conclusion

HLH is an uncommon disease caused by a dysfunctional hyperactive immune response to antigens in predisposed individuals.³ Presenting features include fevers, hepatosplenomegaly and cytopenias.³ The liver is most commonly affected and therefore HLH must be considered in any case of unexplained liver dysfunction.

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Adult intussusception as a cause of chronic intermittent abdominal pain

Nicholas J Fischer, Gerard Bonnet

Clinical—A 67-year-old man was referred to our hospital with a 3-month history of severe intermittent periumbilical pain, causing him to double-over into the foetal position. There were no associated bowel symptoms and no nausea or vomiting. He had a history of diet controlled type 2 diabetes and hypertension but no previous abdominal surgery. The physical examination, including abdominal examination, was unremarkable. Routine blood tests (including full blood count, C-reactive protein, liver function tests and amylase) were within normal limits.

A computed tomography (CT) scan demonstrated *intussusception* of the terminal ileum into the ascending colon (Figure 1). A 4 cm lesion with Hounsfield units consistent with fat density was located at the end of the intussusceptum (Figures 1,3).

Figure 1. A coronal view CT scan image of our patients abdomen demonstrating the submucosal lipoma (upper arrow), and the entry point of the terminal ileum into the caecum (lower arrow)



Figure 2. The ileum is seen intussuscepting into the caecum on laparoscopy in the direction of the arrow

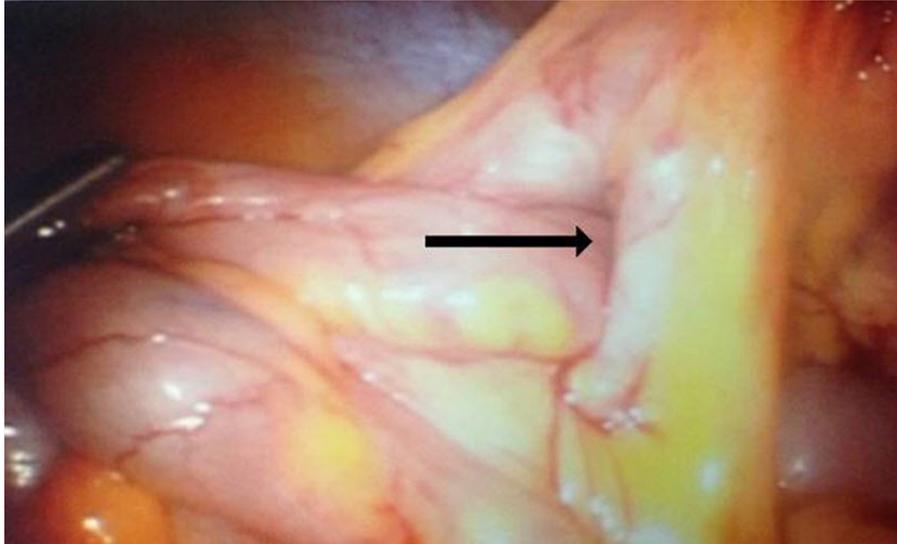
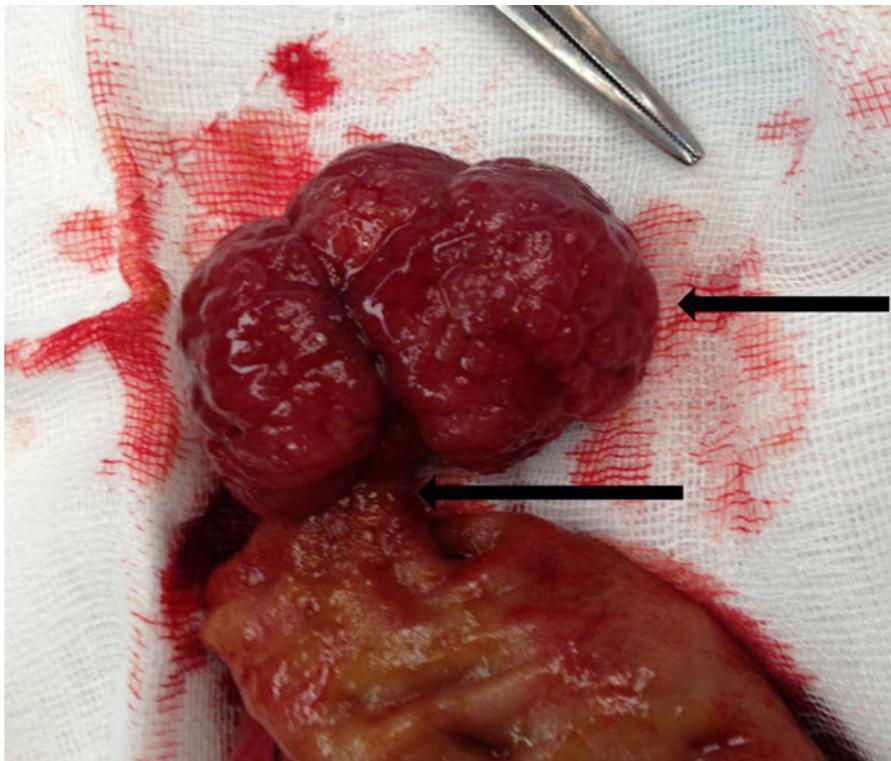


Figure 3. The submucosal polypoid lipoma (top arrow) located in the terminal ileum after laparoscopic right hemicolectomy. The lower arrow points to the stalk of the polypoid submucosal lipoma attached to the luminal surface of the ileum



The diagnosis was confirmed with laparoscopy and the operation proceeded to laparoscopic right hemicolectomy. The histology confirmed the lead point as a submucosal polypoid lipoma.

Our patient made a rapid recovery and was discharged home on postoperative day 3 with resolution of his pain.

Discussion—Intussusception is the invagination of a proximal segment of bowel into an adjacent distal segment.⁶ Intussusception is relatively rare in adults compared with children and accounts for only 5% of all intussusceptions.¹ It is responsible for approximately 1% of bowel obstruction in adults.¹

Adult intussusception is initiated by a pathological ‘lead point’ lesion in 83-93% of cases.¹⁻⁵ Conversely, in children intussusception is usually idiopathic.¹⁻⁴ Lead point lesions can be benign, as in our patient, but frequently are malignant, especially in intussusception of the colon.^{2,3,5}

Benign lesions commonly causing intussusception include lipomas, adhesions, Meckel’s diverticulum and adenoma. Melanoma and lymphoma are responsible for many intussusceptions of the small bowel. Adenocarcinoma can cause intussusception of the colon.¹⁻⁵ The anatomical location of intussusception in adults, frequently involves the small intestine rather than the colon.¹ The ileocaecal valve can also act as a lead point for intussusception.

Symptoms commonly include ‘colicky’ abdominal pain, nausea and vomiting. The classical features of paediatric intussusception including bloody mucoid ‘red current jelly’ stool and a palpable ‘sausage’-like abdominal mass are not features of adult intussusception.⁶

The diagnosis of intussusception in adults can be difficult so make and a preoperative diagnosis is made in only 32–38% of cases, with the remainder being made at laparotomy.^{1,2} Computed tomography has been quoted as having a sensitivity of 78%.¹ The characteristic lesion seen is the ‘target sign’ or ‘target mass’ of the intussusceptum enveloped by the intussusciptiens.^{1,2} Other diagnostic studies include ultrasonography, colonoscopy, upper GI contrast series and contrast enema.

The management of intussusception in adults differs from the way it is managed in children due to the underlying aetiology. Intussusception in children may often be reduced with pneumatic or hydrostatic reduction. In adults, intussusception reduction is not recommended due to the risk of ‘seeding’ tumour cells in the process, or the increased risk perforating inflamed bowel.^{2,3} Laparotomy is usually performed in adult intussusception, with resection of the involved segment of bowel.²

Several case reports appear in the literature describing laparoscopic surgery in the management of adult intussusception.⁷⁻⁹ From our experience, laparoscopic surgery was an effective way to manage our patients intussusception. However, as previously mentioned, in the majority of cases, the diagnosis is actually made during laparotomy, so this method is limited to cases where a preoperative diagnosis is made.

Learning points:

- Intussusception in children usually affects children aged 6 months to 4 years and presents with colicky abdominal pain, bloody mucoid 'red current jelly' stool and a palpable 'sausage'-like abdominal mass and the aetiology is idiopathic.
- Adult intussusception presents with colicky abdominal pain and features of bowel obstruction. The aetiology is predominantly due to a pathological 'lead point' which may be benign or malignant.

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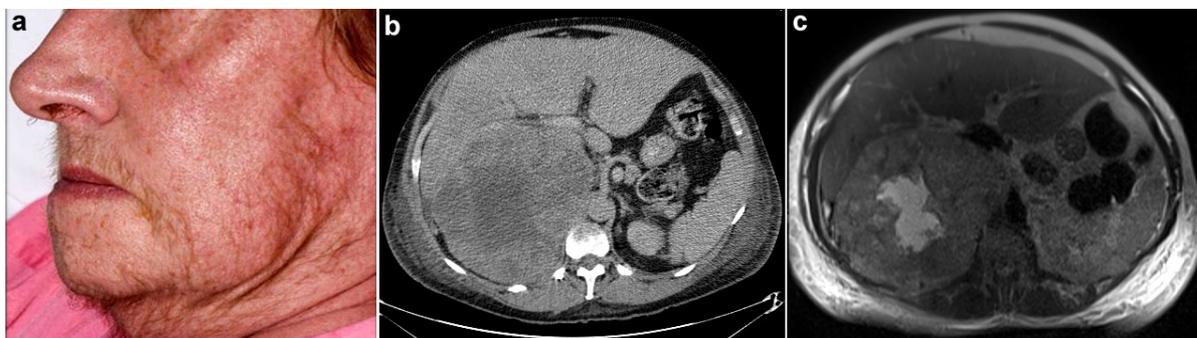
Adrenocortical carcinoma presenting with hirsutism: an uncommon cause of a common complaint

Akheel A Syed, Yared N Demssie

Clinical—A 62-year-old woman was admitted to hospital with shortness of breath and a non-productive cough of a few days' duration. She was noted to have extensive hirsutism involving the face (Figure 1a), lower abdomen and extremities along with male pattern baldness, greasy skin and deepening of voice. She also had facial plethora and bilateral proximal myopathy.

Abdominal examination revealed an ill-defined, non-tender right upper quadrant mass. Abdominal imaging by ultrasound, computed tomography (Figure 1b) and magnetic resonance imaging (Figure 1c) confirmed the presence of a large heterogeneous suprarenal mass infiltrating the kidney along with evidence of liver and pulmonary metastasis and tumour thrombus in the inferior vena cava.

Figure 1. (a) Thick, terminal hair on the upper lip, cheek and chin and greasy skin was noted; (b) Cross-sectional imaging by computed tomography demonstrated a large, poorly-enhancing mass in the right suprarenal region; (c) The heterogeneous appearance of the right adrenal tumour was better delineated on magnetic resonance imaging



Laboratory tests revealed high levels of serum testosterone at >52.0 (normal <2.4) nmol/L, androstendione at >35.0 (1.0–11.5) nmol/L and oestradiol at 743 (postmenopausal <201) pmol/L with suppressed luteinising and follicle stimulating hormone levels. Serum human chorionic gonadotrophin, dehydroepiandrosterone sulphate and 24-hour urinary metanephrine and normetanephrine levels were normal.

Serum potassium and aldosterone levels were likewise normal. Urinary free cortisol levels were raised on two occasions at 587 and 479 (0–180) nmol/24 h. Her basal serum cortisol level at 0930 h was raised at 1430 (250–650) nmol/L, and failed to

suppress on overnight dexamethasone (1 mg) suppression test with serum cortisol level at 1369 (normal suppression <50) nmol/L the following morning at 0900 h.

Histological examination of tumour tissue obtained by ultrasound-guided biopsy confirmed adrenocortical cancer with a high proliferation index. A computed tomographic pulmonary angiogram also showed pulmonary tumour emboli and metastases. Despite anticoagulation and palliative treatment with metyrapone she soon succumbed to progressive respiratory failure.

Discussion—Although hirsutism is a common complaint in women and most frequently secondary to functional causes such as polycystic ovarian syndrome,¹ rapidly progressive extensive hirsutism or virilising features should prompt further investigation for androgen-secreting tumours.

Adrenocortical carcinoma is a rare malignancy with an incidence of 1–2 per million population.² There is evidence of adrenal steroid hormone excess in approximately 60% of cases and rapidly progressing Cushing's syndrome with or without virilisation is the most common presentation.²

Cross-sectional imaging by CT and MRI, and more recently functional imaging by ¹⁸F-fluorodeoxyglucose positron emission tomography, have been used to distinguish between benign and malignant lesions and to plan appropriate treatment.³ Definitive treatment by en bloc primary surgical resection of the tumour offers the best prognosis.

Adjuvant medical therapy with mitotane, radiotherapy or cytotoxic chemotherapy may offer some benefit in more advanced disease. Adrenostatic drugs such as metyrapone, ketoconazole, aminoglutethimide, and etomidate may be used to block steroidogenic enzymes and alleviate hormonal symptoms.^{2,4}

Learning points

- Hirsutism is a common complaint in women, most frequently secondary to functional causes such as polycystic ovarian syndrome.
- Rapidly progressive hirsutism, virilising features, or a palpable abdominal or pelvic mass should prompt further investigation for androgen-secreting tumours.

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Consumption of vitamin C is below recommended daily intake in many cancer patients and healthy volunteers in Christchurch

Vitamin C (ascorbate) is an essential micronutrient required for numerous biological functions, including its action as a cofactor for enzymes.¹ As cofactor, it is required for the synthesis of collagen, carnitine, neurotransmitters, and peptide hormones, and in the regulation of specific epigenetic enzymes and transcription factors.²

Most animals can synthesise ascorbate from glucose, but humans cannot due to mutations in the biosynthesis pathway.¹ Because ascorbate is highly water-soluble and has a high turnover rate, a regular and adequate dietary intake is essential to prevent hypovitaminosis C and the deficiency disease scurvy. Low levels of ascorbate are common,³ especially in at-risk groups such as those on low income, smokers or severely ill patients.⁴⁻⁶

Anecdotal evidence suggests that cancer patients often modify their dietary habits to improve nutrition and vitamin intake. We aimed to determine whether this is the case with respect to intake of ascorbate by cancer patients, compared with healthy volunteers, and to relate this to national guidelines.

Participants were recruited to report dietary habits via a written survey. All suitable adult cancer patients attending Oncology Services at Christchurch hospital, for appointments or therapy during the survey period (1 November–31 December 2012) were approached and invited to participate. Healthy volunteers were recruited via a variety of community-based approaches to match cancer patients by age and gender.

A single time-point survey of dietary habits was conducted. It included questions on food frequency (how much and how often fruit, vegetables, fruit or vegetable drinks and vitamin supplements were consumed) and whether (and why) their intake had changed recently, a 24h diet recall (what and how much food and drink was consumed in the previous 24 hours), and a 1-week food diary (details of food types and quantities over a one week period). Ascorbate intake was calculated from the reported food and drink consumption, as well as supplement intake, using the FoodWorks Nutrition Software for diet and recipe analysis (FoodWorks© 2007).

For this survey, 104 participants were recruited (50 cancer patients and 54 healthy controls). Half in each group were female, the mean age (57 years), ethnicity and BMI were similar, and smoking status was comparable, although fewer cancer patients were current smokers. Most cancer patients had breast cancer, then colorectal cancer, followed by other types of cancers. Half of all cancer patients were undergoing chemotherapy, and 30% had advanced disease.

More than half of the cancer patients (30/50) reported a change in diet following diagnosis, with none of the healthy volunteers reporting a recent change. Yet, both groups reported similar ascorbate consumption, with mean daily ascorbate intake

calculated from all three questionnaires of 196 mg for cancer patients and 185 mg for healthy volunteers.

Ten of the cancer patients, and 9 of the healthy controls, reported using supplements containing ascorbate, ranging from 6–1026 mg per day (mean 63 mg/day) for cancer patients, and 4–1075 mg per day (mean 66 mg/day) for healthy controls. Of the 50 cancer patients, 3 mentioned being told by clinicians to avoid ascorbate supplementation, with a total of 7 cancer patients reporting reduced supplement use and 2 reporting increased supplement use since diagnosis.

For further analysis, participants were placed into three categories: below recommended daily intake (RDI, less than 45 mg per day), above RDI but below suggested dietary target (SDT) to prevent chronic diseases (45–200 mg per day), and at and above SDT (above 200 mg per day).⁷

According to the 24h recall data (including supplements), 23% of cancer patients and 20% of healthy controls consumed ascorbate below RDI. Most participants had between the RDI and SDT intake (57% and 50% for cancer and controls, respectively), whereas 20% of cancer patients and 30% of controls had intakes at and above the SDT. The other two dietary questionnaires showed similar trends.

Overall, 80% of cancer patients, and 70% of healthy controls consumed less ascorbate than that recommended by the New Zealand Ministry of Health (MOH)⁷ to prevent chronic diseases.

The impact of current chemotherapy treatment on diet was explored in the cancer patient cohort to determine whether treatment changed dietary habits. Although generally intake was similar regardless of treatment, ascorbate intake derived from drinks was higher in patients undergoing chemotherapy (94 mg) compared to other cancer patients (20 mg; $p=0.04$).

Overall, cancer patients are aware of the need for a healthy diet, yet 80% consumed less ascorbate than the amount recommended by the MOH.⁷ Our pilot data may be clinically important, as suboptimal ascorbate intake in the general population is associated with all-cause mortality,⁴ plasma ascorbate concentrations decrease with increasing age,⁸ and estimated intake is predictive of cancer risk.⁹

Further research to measure ascorbate levels in samples from cancer patients¹⁰ will provide more definitive information and help gauge the level of intervention required to restore healthy levels. Meanwhile, we support health messages which educate the public of the importance of eating a healthy diet.

Although five servings per day of fruit and vegetables can provide 200 mg/d of vitamin C (SDT), this will only be the case if one of these servings is a high vitamin C food, such as citrus or kiwifruit, as many commonly consumed foods, such as apples and bananas, contain relatively low levels of vitamin C.

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Wise use of antibiotics

PHARMAC have run for around a decade now a campaign for the “Wise Use of Antibiotics”. Its measure of success has been a lower use of antibiotics and the ensuing cost savings. However, “wise use” imports the notion of “quality use”, in other words are we targeting the right antibiotics to the right people?

I have not been able to find any evidence of research to enquire into the quality use of antibiotics by PHARMAC despite Coroner Shortland recommending in 2011 that the relevant parties work to provide guidelines for what constitutes “suspicion” of meningococcal disease warranting immediate iv antibiotic administration.¹

One of the key messages of PHARMAC’s campaign is that antibiotics don’t work for flu or the common cold. As a result, it is easy to see that fewer antibiotics are prescribed for anything that loosely fulfils the influenza-like illness (ILI) description. However, in asking the “quality” question one must ask just how proficient are we at accurately diagnosing influenza?

BPAC Guidelines for diagnosing influenza are:²

During periods of increased influenza prevalence, the acute onset of fever and cough makes a diagnosis of influenza more likely. When prevalence is low, the presence of influenza-like symptoms is less accurate for diagnosing influenza.

When a patient presents with symptoms and signs of influenza, four questions are useful to distinguish between influenza and influenza-like illness:

- Are influenza viruses known to be circulating in the area?
- Did the patient experience a sudden onset of symptoms?
- Is the patient’s temperature significantly raised (> 38°C)?
- Does the patient have both systemic and respiratory symptoms, particularly cough?

If the answer is “yes” to all of these questions, influenza is the likely diagnosis.

Differential diagnoses include:

- Other respiratory viral infections, e.g. respiratory syncytial virus, coronavirus, rhinovirus
- Meningitis
- Pneumonia
- Although rare consider malaria in people who have recently travelled to an area where malaria is endemic

As a guide for GPs, to say the “differential diagnoses include meningitis” is potentially confusing as the differential diagnosis includes meningitis as well as meningococcal septicaemia which can have quite a different symptomatology and course of disease.² For example, a lumbar puncture is contraindicated in the case of meningococcal septicaemia because of the risk of DIC and bleeding into the spinal column. Meningococcal septicaemia is not characterised by a stiff/sore neck or photophobia. Conversely, meningitis is not typically characterised by the pathognomonic purpuric “rash”.

It is important to note that the UK Guidelines for Meningococcal Disease note that:³

- As few as 5% of childhood meningitis cases have photophobia
- Neck stiffness ranges from 62% to 75% of childhood meningitis cases
- Purpuric rash occurs in around 40% of cases during the critical early stages

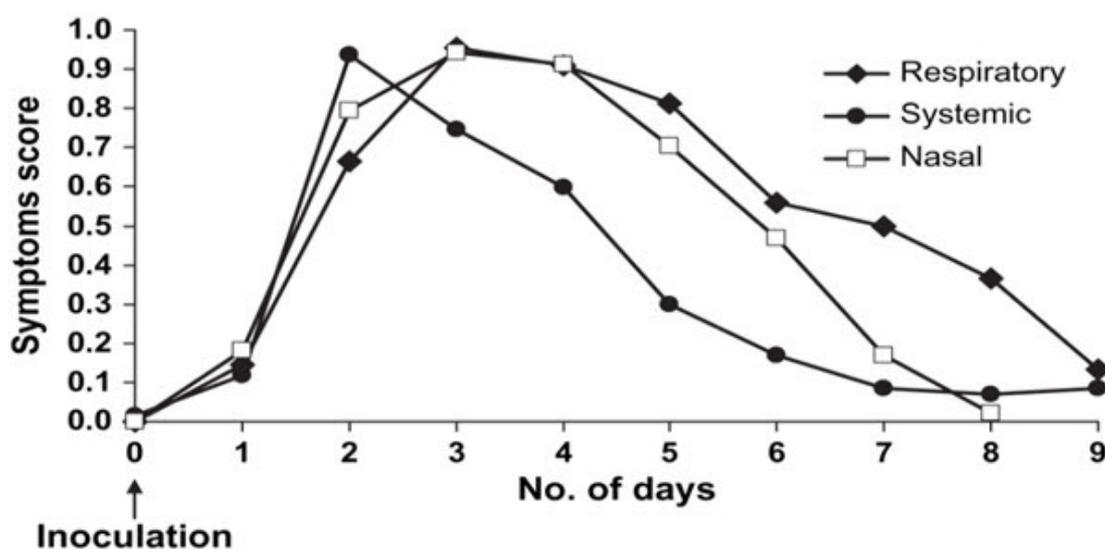
In our experience there is considerable confusion and certainly no consensus about what constellation of symptoms constitutes “suspicion” of meningococcal disease and thereby requires the immediate administration of appropriate intravenous antibiotics.

In the recent cases of 18-year-old Ben Brown of Whangarei who died of meningitis in 2011 and the case of our own son Zachary who died in 2009 of meningococcal septicaemia at the age of 22 years, both men had acute onset of fever in the absence of cough or other respiratory or coryzeal symptoms. Nonetheless a working diagnosis of influenza was made.^{1,4}

The justification for a working diagnosis of ILI being reasonable under the circumstances of a circulating influenza virus is usually made on the basis of the assertion that it is possible for there to be fever in the absence of respiratory symptoms and cough in the early stages of acute influenza.

The *American Family Physician* reviewed the natural course of influenza in 2003 and confirmed a clinical picture first described in 1976 (refer to Figure 1 of *Am Fam Physician*).⁵ First, influenza is accompanied by an acute onset of coryzeal symptoms at time zero. Second, at the time of peak fever the constellation of symptoms of coryza, headache, myalgia, sore throat, cough and malaise were all present (Figure 1 of *Am Fam Physician*).⁵

Figure 1. Summary curves of systemic symptoms (fever, muscle aches, fatigue, headache), respiratory symptoms, or nasal symptoms scores. Seven curves (159 infected participants) were considered for the systemic scores (20, 34, 74, 79–82), five curves (132 participants) for the nasal scores (20, 34, 79–81), and two curves (28 participants) for the respiratory scores (28, 75). A score of 1 corresponds to the maximum reported score value (refer to Materials and Methods in ref 6) (Reproduced by kind permission of Professor Fabrice Carrat⁶)



In a 2008 meta-analysis published in *Am J Epidemiol*⁶ a similar pattern is described (see Figure 1 above). In particular, peak fever corresponds to 80% of peak nasal symptoms and 70% of peak respiratory symptoms.⁶

I submit that, particularly during a known meningococcal outbreak, acute onset of fever (along with other systemic symptoms such as tachycardia, tachypnoea, vomiting and low blood pressure) in the absence of cough or coryza is reasonable grounds for ‘suspicion’ of meningococcal disease regardless of the presence of sore neck, photophobia or “rash” and thus constitutes a reasonable basis for intravenous antibiotics.

If possible a blood sample for later culture should also be taken prior to administration of the iv antibiotics. However, it is worth remembering that the definitive diagnosis of meningococcal disease in the case of both Ben and Zachary was made post mortem as is so often the case.

There appears to be poor awareness of what properly constitutes ILI. The BPAC Guidelines are disappointingly misleading regarding meningitis and meningococcal septicaemia and there remains no stated guidance on what might reasonably constitute “suspicion” of meningococcal disease. The time has come to review our guidelines and advice as recommended by Coroner Shortland.^{1,4}

Competing interests: None.

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The taxing of fizzy drinks

It is valuable for Ni Mhurchu and colleagues to have demonstrated the potential positive impact on health outcomes and equity of taxation on sugar-sweetened beverages in the New Zealand context.¹ However, an emphasis on the taxation of carbonated soft drinks alone detracts from the need to consider the wider soft drink market.

The soft drink market includes products other than carbonated drinks, that can contain significant amounts of sugar, and make up about a quarter of the sales of Coca Cola Amatil, the premier seller in New Zealand.^{2,3} Artificially sweetened drinks also act as an appropriate substitute product for sugar-sweetened soft drinks and so it is important that a tax on soft drinks is applied to sugar-sweetened drinks alone.

How a tax is applied can impact its effect. A duty applied to volume or sugar content rather than as a percentage of value reduces the potential of consumers to respond by purchasing cheaper brands or buying in bulk.⁴

The use of fiscal measures to reduce the consumption of simple sugars to improve nutrition and health is warranted as health education has a limited effect on behaviour⁵ and non-regulatory measures alone are considered to be insufficient.⁶ However, the impact of taxation should be enhanced with concomitant education,⁷ as the awareness of health harms reinforces the impact of taxation on food consumption.⁸ The earmarking of the funds raised, for health programmes as the authors suggest, may improve societal acceptability⁹ and would be similar to the taxation of alcohol.¹⁰

In two Pacific nations taxes on sugar drinks were initiated expressly for health reasons and to generate revenue to enact preventive health interventions.⁸ Let's hope that this option gains traction in New Zealand as it has done in other parts of the World.

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Comment on “why do patients choose the emergency department?”

Dear Sir

In regards to Mike Ardagh’s editorial¹ “Why do patients choose the emergency department?” surely the answer lies in his sentence “...she [the mother] calls her GP but can’t get an appointment until Thursday.”

All I can say is that general practice must have changed since my time. My practice had an inflexible rule that anyone who called worried concerning a sick child was always *seen on that day*.

Has general practice just become a 9–5 job?

Henry E Green

Retired GP

Ashburton, New Zealand

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Question time

I was a House Surgeon at Nelson Hospital in 1960. Amongst the general practitioners in the town were a few old doctors who showed up from time to time. One of them was J.P.S. Jamieson, by that time a man in his eighties. (It was from him, over a cup of tea, that I would hear about the treatment of diphtheria in children ninety years ago.) He had been the President of the New Zealand Branch of the British Medical Association, and he was one of the few proper leaders we have ever had.

Each of these men provided succour and support to a handful of mainly elderly patients. Their activities, so far as one could judge, were absolutely harmless. No cases of mismanagement or neglect found their way into the wards.

Some years later, a retired Auckland obstetrician wrote to the *New Zealand Medical Journal* to complain about the cost of the annual registration with the Medical Council, which he said was too dear. If he gave it up because of the cost, he complained, he would be unable to write prescriptions. This got him a firm put-down from the Chairman of the Medical Council, who, if my memory serves me correctly, was Dr W.S. Alexander. He made it clear that the Council was opposed to this business of an old doctor treating family members. Dr Alexander had a valid point in respect of an obstetrician. Now the Council has set its sights on all older GPs.

A few days ago, I spotted a red flag. I was talking to my own GP. He has the view that the demands of the Royal College of General Practitioners make it a worse proposition than bpac, so he has gone with them, and he is already embarked on his tick-a-box higher education, at a cost of \$1200 p.a. plus GST.

Ominously, my doctor says that the questions are “easy”. Ah, “easy,” are they? So why does bpac want to dish up to experienced GPs easy questions at considerable expense? What’s the point? Why did the Medical Council not think that existing safeguards were good enough? There have been no published complaints about general practitioners perceived to be deficient in knowledge. The big boss is taking a hammer to a peanut, turning up the heat on the oldies by requiring them to pay for things that they don’t need. We cannot expect that either the cost of the annual ticket, nor the “easy” questions coming out of bpac, will stay as they are for long. Costs will rise.

Younger doctors should heed the warning. At the age of sixty, you will be ‘on yer bike’, unwilling or unable to manage either the Medical Council dues, or the bpac questions about the drugs with the unpredictable side-effects and the unpronounceable names. Save hard, and don’t think that you will be allowed to supply remedies to your grandchildren.

It is taking longer than ever to get into independent general practice, you’ll be paying lavish sums to locums, and in no time at all you’ll be looking down a slippery slope marked “exit”. At the end of the day, it is the patient who pays for all this over-scrupulous “improvement”.

Doctors cannot provide economical primary care when they have to meet the demands of the Royal College and the Medical Council. The GPs need leadership. Where is it?

Roger M Ridley-Smith

Retired GP

Wellington, New Zealand

Notes of a case of traumatic epilepsy

Excerpt from a case written by W. Fergus Paterson and published in NZMJ 1913 December;12(48):621-3.

Patient aet. 35 was thrown from his motor bicycle against a railing mischievously placed across a foot-bridge in 1907. He remained unconscious for several hours. After a period of some months during which he was in his usual health, he developed "petit mal," which later assumed the graver form of major epilepsy. Fits occurred more frequently and latterly without aura, and patient would remain in status epilepticus for three or four days, and on one occasion for a week, without return to consciousness. Convulsions were extremely vigorous and cyanosis marked with stertorous respirations in the intervals.

Bromide administration was of little avail, and quickly nauseated patient. Injections hypodermically of morphine and atropine were also tried, and chloroforming proved a temporary palliative.

Eventually it was decided to attempt surgical measures. Localising symptoms were few, but comprised convulsive twitching of muscles of neck and shrugging of the left shoulder and grinding of teeth, which always preceded general convulsion. In addition to above, patient complained of a localised tenderness on the right side of the vault of the cranium, and a chronic headache. X-radiography failed to elicit anything in the way of depressed bone or thickening of the cranial vault.

Operation.—The head having been shaved, no external sign was found to indicate site of injury. Deducing from the above facts that the site of pressure was in all probability in the region of the rolandic fissure over the middle third of the ascending frontal convolution, and as the local tenderness and headache corresponded, craniotopographical measurements having been taken, the fissures of Rolando and Sylvius were outlined with lunar caustic.

Patient was anaesthetised and a liberal semicircular flap incised and reflected, The pericranium was also incised and the bone denuded sufficiently to admit of a trephine opening of one and a quarter inches in diameter. The dura mater was incised by a triradiate incision and reflected, bringing to view a traumatic cyst, the so-called "arachnoid cyst." This was incised and dissected out, two small dilated veins were ligatured with Van Horn size 0 catgut, and a hairpin shaped seton of silkworm gut inserted and the dura sutured. The free end of the seton was drawn through a puncture in the scalp flap, and the latter replaced and sutured.

The seton was removed three days later, and patient left the hospital a fortnight later, i.e., January 1st, 1912, and up to date of writing is in perfect health, has lost his migraine attacks, and has evinced no trace of his former epileptic attacks.

Risk of first venous thromboembolism in pregnant women in hospital

It is known that admission to hospital increases the risk of venous thromboembolism. This report investigates the situation with respect to pregnant women. This cohort study derives data from over 200,000 pregnant women in England.

Exposure to the risk was evaluated in those admitted to hospital during pregnancy, but not for delivery or thromboembolism. The researchers report an 18-fold increase in those admitted to hospital compared with those not admitted. The increased rate was sustained during 28 days after discharge (6-fold).

BMJ 2013;347:f6099.

Mitral-valve repair versus replacement for severe ischemic mitral regurgitation

Ischemic mitral regurgitation is a consequence of adverse left ventricular remodelling after myocardial injury or infarction. Medical treatment of the regurgitation and its consequences is often unsatisfactory.

Consequently surgical intervention is often indicated. The options are repair or replacement of the damaged valve. Studies suggest that repair has a lower perioperative mortality risk whereas valve replacement provides a better long-term correction with a lower risk of recurrence.

This report is of a trial in which 251 such patients were randomised to receive valve repair or replacement. The researchers' conclusions were that there were "no significant difference in left ventricular reverse remodelling or survival at 12 months between patients who underwent mitral-valve repair and those who underwent mitral-valve replacement. Replacement provided a more durable correction of mitral regurgitation, but there was no significant between-group difference in clinical outcomes."

N Engl J Med 2014;370:23–32.

Dextrose gel for neonatal hypoglycaemia

Neonatal hypoglycaemia is important because it is a common disorder, which is associated with brain injury and poor neurodevelopmental outcome. Treatment options include feeding with frequent blood tests, intravenous glucose in severe cases and the use of 40% dextrose gel administered into the buccal mucosa.

This report concerns a trial comparing feeding alone or feeding plus the use of the gel. 237 babies were considered to be at risk of hypoglycaemia because of the known risk factors—maternal diabetes or obesity, being preterm, or being small or large at birth.

The 237 babies were randomised to receive 200 mg/kg of 40% dextrose gel or placebo gel massaged into their buccal mucosa and were encouraged to feed.

Treatment with the dextrose gel was found to reduce treatment failure significantly and the researchers suggest that buccal dextrose gel should be considered for first line treatment to manage hypoglycaemia in late preterm and term babies in the first 48 hours after birth.

Lancet 2013;382:2077–83.

Philip John Rushmer

West Auckland GP leaves fitting legacy for patients

Philip Rushmer, a giant among west Auckland GPs, whose determination to improve the region's health services inspired four practices to combine into a single integrated health centre, died in February 2014 after a seven-year battle with cancer. He was 71.



Visionary thinking, sincere leadership and an unending dedication to his patients typify Dr Rushmer's medical career.

These qualities were poignantly illustrated as he chaired his final HealthWEST meeting from his living room, just over a week before his death.

Sitting in a La-Z-Boy chair in his Titirangi home, the thoughtful, articulate doctor, who treated generations of the same families, resigned from the leadership post of the social services organisation he had held since 2007. "I have been to many board meetings over the years with many organisations, but every part of that meeting I will remember vividly," HealthWEST chief executive Aroha Hudson says.

At the meeting's conclusion, Ms Hudson presented Dr Rushmer with a pounamu manaia. "It acts as a provider and a protector, and is likened to a bird sitting on your shoulder looking after one's spirit, and when your time comes it will guide your spirit where it is supposed to go," she says.

Dr Rushmer was born 24 May 1942 and grew up on a farm in the rural English village of Toft Monks, Norfolk. His father William died when Dr Rushmer was seven, leaving his mother Sybil to raise four children.

"[Sybil's] love of music was inherited by the family and Philip enjoyed a passion for classical music and opera that lasted a lifetime," says Penny Rushmer, Dr Rushmer's widow.

After completing schooling at Paston School, Dr Rushmer was accepted to study medicine at Guy's Hospital in central London. In 1966, while still training, he met Penny, whom he married in 1968.

Dr Rushmer's general practice career began in the rural community of Candover Valley, in Hampshire. By 1976, he had become disillusioned with the UK's National Health Service and, on the recommendations of locums who had come through his practice, his family packed their bags and moved to Titirangi, west Auckland, where he joined Golf Road Medical Centre.

In 1982, GP Vicky Macdonald and her new husband had just moved to Golf Rd, and Dr Macdonald needed to find a general practice placement as part of her Primex exam. Her husband suggested dropping in to the medical centre down the road. She entered the practice looking for a six-week locum, met Dr Rushmer, and walked out a co-owner. Dr Macdonald worked alongside Dr Rushmer for the following three decades, and says he was consistent and unwavering in his fairness and optimism.

"In all that time we never had any arguments or disagreements. We were able to sit down and work through issues and, most of the time, Philip was able to convince me his way was correct," she laughs. Indeed, Dr Rushmer's exceptional negotiating skills saw him take up several general practice leadership posts throughout his career.

One of his early roles was as chair of the NZMA Maternity Services Negotiating Committee. Dr Rushmer was a staunch advocate for the role of GPs in obstetrics and he fought for the rights of women to be given the choice of who delivered their babies, remembers west Auckland GP Jonathan Simon.

Dr Rushmer was inaugural chair of the NZMA GP Council in 1998, following the demise of the General Practitioners' Association, and held the role until 2001. He then served on the NZMA board for several years, before turning his political attention to his own west Auckland neighbourhood. He joined the board of HealthWEST in 2006 and became chair the following year.

For his contribution to general practice, Dr Rushmer was made a distinguished fellow of the RNZCGP in 2011. "Philip is known as a treasured source of wisdom and compassion, and is selfless and dedicated to the medical profession," the college said at the time.

At the age most people consider retiring, Dr Rushmer was finding his second wind. He could see problems in the way health services were being delivered to west Aucklanders and, with fellow GP Peter Woolford, he began canvassing opinion among GPs in the area about joining forces.

In September 2007, with Drs Woolford and Macdonald, plus GPs Craig King and Maelen Tagelagi, he began planning a medical centre that would offer something the individual practices could not. The result is Totara Health Services, an enormous integrated family health centre offering general practice, specialist and social services in the heart of New Lynn.

At the practice opening last June, in front of a 100-strong crowd which included prime minister John Key, Dr Rushmer reiterated the vision for patient-centred care he shared with his colleagues, and called out Waitemata DHB for dropping the ball in meeting the community's needs. "To the DHB, I say let's work together to improve your engagement with primary practice, and focus on putting the patient first," he said.

Dr Rushmer was unafraid to step on a few toes, but it was always in the interests of his patients, Dr Woolford says. He wanted to leave a legacy that would ensure his patients' healthcare was the best it could possibly be.

Dr Rushmer was battling cancer throughout the clinic's development. In 2007, he was diagnosed with prostate cancer and, after beating it, he received a bladder cancer diagnosis two years later.

Yet, he persevered in his work. Dr Woolford says Dr Rushmer was always putting his hand up to fill in at Totara Health Services, and ran clinics until his illness forced him to retire. He was showing a Health Workforce New Zealand representative around the practice just 10 days before he died.

More than 300 people attended Dr Rushmer's funeral service at Davis Funerals in Henderson earlier this month. He was described by colleagues and patients as dignified, gracious, a true gentleman.

He was buried wearing the pounamu manaia gifted to him by HealthWEST.

On the service programme, Dr Rushmer is pictured grinning and holding a cigar. The caption reads "Do what you love". It's a mantra which, by all accounts, Dr Rushmer lived his life by.

This obituary originally appeared in *New Zealand Doctor* newspaper (www.nzdoctor.co.nz) and was written by Jeremy Olds.