



Gestational diabetes mellitus in Tonga: insights from healthcare professionals and women who experienced gestational diabetes mellitus

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Abstract

Aim To gain contextual insights from Tongan healthcare professionals and women who had developed gestational diabetes mellitus (GDM).

Method Qualitative, individual, semi-structured, face-to-face interviews were conducted during 2006 with 11 women who had developed GDM in the previous 12 months and 10 health professionals who worked in the GDM/diabetes area in Tonga.

Results Due to funding issues glucose supplies were often scarce which precluded universal screening. GDM management which focused on encouraging behavioural change to diet and physical activity were reported to be effective in managing GDM in Tonga. Changes to physical activity levels were difficult because of 'laziness' (the participant's words). Preventative screening was perceived to be a foreign idea in Tonga which negatively influenced post-partum screening and monitoring.

Conclusion GDM was reportedly well-managed through lifestyle interventions. 'Laziness', identified as a contributing factor to obesity and physical inactivity needs to be considered within a broader context of complex social and economic changes in Tonga. There are clear challenges to shift attitudes towards preventative screening in Tonga and for screening supplies to be adequately funded. Lifestyle intervention targeted towards modifiable risk factors of obesity and physical activity for GDM and Type 2 diabetes need to extend into the postpartum period.

Diabetes, including GDM is a significant and increasing² global public health issue in the Asia-Pacific region.³ The overall rate of diabetes in Tonga is 15.1% which has doubled in the last 25 years.⁴

Women from the Pacific Islands are a known high risk group for diabetes⁵ with reported incidence rates of GDM around 20%.⁶ Women who develop GDM have an increased risk of developing GDM in subsequent pregnancies⁷ and many women who have had GDM will go on to develop Type 2 diabetes later in life.¹

Yet, research into GDM in Tonga is virtually non-existent. This qualitative study explored GDM in Tonga, through interviews, with women who experienced GDM and health professionals who worked in the GDM/diabetes area.

The research was undertaken in Nuku'alofa, the capital of Tonga, in May/June 2006. Ethics approval was granted from the Tongan Ministry of Health and Southern Cross University, NSW, Australia.

Methods

The researcher worked closely with a Tongan counterpart; a senior medical officer who worked at Vaiola Hospital, the main hospital in Tonga on research design and implementation.

Participant recruitment—A purposive sampling method was used by the counterpart who recruited all participants. Thirty women who had experienced GDM in the previous 12 months, who had their baby at the main hospital in Tonga were contacted by phone and the study explained. Eleven women agreed to be interviewed by the researcher at the hospital and travel costs were reimbursed. Three women were not contactable despite several attempts and messages left. Although not explicitly determined, the counterpart suggested reasons for non-participation of 16 women related to difficulties travelling to the hospital; other commitments or reluctance to participate in research conducted by a *palangi* (foreigner).

The health professionals worked in the area of GDM/diabetes within the Ministry of Health. Most worked at the main hospital in either the diabetes clinic, maternity ward, ante-natal clinic or obstetrics and gynaecology. One health professional worked at a local village health centre. All health professionals contacted by the counterpart agreed to be interviewed.

Interview rationale and techniques—Following discussion with the Tongan counterpart, a verbal interview was deliberately chosen as the most appropriate qualitative data collection method for all participants based on its suitability and potential to obtain a detailed picture of how people experience their world.⁸

Although schooling in Tonga is conducted in English it was suggested by the counterpart that some women's reading and writing skills may not be as proficient as conversational English. Therefore, a written survey was deliberately not used.

Interviews with all participants were face-to-face, in-depth, individual and semi-structured. Interviews were tape-recorded, transcribed and analysed for key themes by the researcher. All participants provided written informed consent to be interviewed. The consent forms (the 'Savea Suka Feitama') were written in the Tongan language.

Interview objectives—The objectives of the interviews with women who experienced GDM were to explore if, and how, a diagnosis of GDM influenced behaviour change, particularly in relation to diet and physical activity; any concerning/motivating factors that influenced change and insights into what was needed to support sustained change. The objectives of the interviews with the health professionals were to explore the screening, management and follow-up of GDM; whether GDM was seen as a warning signal for the prevention of Type 2 diabetes and key GDM issues regarding weight, diet and physical activity.

Interview questions—Guiding questions were developed to enable an exploration of the topic in line with the research objectives. These questions ensured the interviews were focused but also allowed for conversation. (See Tables 1 & 2)

Table 1. Women who experienced GDM interview guide

Question

- Do you have a family history of GDM? Relationship?
- If you were concerned, what were you mainly concerned about a diagnosis of GDM?
- After the diagnosis of GDM what information were you given about GDM?
- Were you given any information about physical activity in relation to GDM? If so, what was the advice?
- Did the diagnosis of GDM influence you to change your physical activity levels at all?
- What helped you engage in physical activity during your pregnancy and after the baby was born?
- What are some of the barriers to you doing physical activity during pregnancy and after the baby was born?
- Are there any particular things for Tongan women that you think influence exercise / physical activity levels during pregnancy?
- Do you think Type 2 diabetes is a significant health issue for Tongan people generally?
- What do you think is needed to prevent diabetes/ GDM?

The interview with GDM participants began with questions concerning age, number of pregnancies, and family history of Type 2 diabetes. The interview with the healthcare professionals began with questions about their profession and work in relation to GDM and/or Type 2 diabetes.

Table 2. Health professional's interview guide

Question

- What is your understanding of a woman's risk of developing gestational diabetes?
- Can you tell me about the general screening and diagnostic tools that are used?
- What is your usual treatment/management of gestational diabetes?
- What are your views about exercise/physical activity in terms of the management/prevention of gestational diabetes?
- What recommendations (if any) would you make to women with a recent diagnosis of GDM?
- In what ways do you think culture may influence women during pregnancy in terms of general lifestyle and behaviour factors?
- What do you consider to be the barriers to pregnant women and women generally engaging in physical activity?
- What are your thoughts on the significance of GDM and Type 2 diabetes in Tonga?

Results

Individual face-to-face interviews were conducted with eleven women who had experienced GDM in the previous 12 months and ten health professionals. Interviews with GDM participants ranged from 20 to 40 minutes and with health professionals 40 to 60 minutes.

The average age of women interviewed who had GDM was 34 years (24-40 yrs). Seven of the eleven women had a family history of diabetes and two women had a family history of GDM. Although BMI was not ascertained, all women were overweight.

Doctors, registered nurses/midwives and a dietician were interviewed. Those who work within the Ministry of Health, particularly in the GDM, diabetes area and obstetrics and gynaecology areas are relatively few in number. Therefore, in order to avoid identification of any particular health professional and to ensure confidentiality, the results of interviews with the health professional are presented generally as themes, developed according to commonality.

Interviews with women who had developed GDM

Ways the diagnosis of GDM influenced behaviour change (specifically regarding diet and physical activity)—All women were influenced by education and an increased awareness of the need for some kind of behaviour change as a result of a diagnosis of GDM. *‘Not doing enough exercise and too much eating is why I put on weight and got GDM’.*

Recommendations for dietary change were mentioned by all women. Women reported being advised to eat more fruit and vegetables, eat more fish and ‘pulu’ (cow) and less ‘buaka’ (pork); drink water and not soft drinks; reduce their intake of sugar, fat and

starch and to eat smaller meals, particularly at night. Some women were advised to lose weight. Women were advised to become more physically active; mainly to walk.

Difficulties with behaviour change were a common theme for all women; *'it was hard to change but I tried not to eat so much fat or sugar'*. Not all reported becoming more active and two women specifically said they did not make any changes to physical activity levels.

Concerning or motivating factors that influenced any changes to diet or physical activity—Adopting more healthy behaviours during pregnancy was generally motivated by concerns for the health of the baby. Fear of a caesarean was a concern; *'scared that if the sugar was too high they would take the baby out'*.

Fear of developing diabetes was reported a motivating factor for change. One woman was fearful that if she kept eating 'buaka' (pork) she would develop diabetes. Another woman commented on a woman in her village that *'had her foot cut off because of diabetes'*.

Laziness [the women's words] was perceived by all women to negatively influence changes to physical activity; *'it's hard for the lazy people but not hard for the people afraid of death'*. An awareness of the benefits of the recommended changes was a theme; *'exercise makes you feel healthier'*.

Perceived ways to support sustained change—In terms of GDM prevention, a common theme was that doctors and nurses should provide lifestyle education to women before marriage and pregnancy on ways to prevent GDM and Type 2 diabetes. Educational programs from the Ministry of Health; *'to let people know if they don't do this then they get that'*, were viewed as effective ways to support sustained change.

No comments were made about follow-up support or screening.

Interviews with healthcare professionals

A consideration of the key screening, management and follow-up issues in relation to GDM—Screening was viewed as essentially a very cost-effective package for the *'national battle against diabetes'* and important *'not only for its obstetric value but as a predictive factor for the future'*. 'At-risk' women were advised of lifestyle changes to weight, diet and physical activity that could delay or prevent the onset of permanent diabetes. Cost-effectiveness in managing GDM was reported with clear evidence in Tonga that diet-control to manage GDM, does make a difference because few women required insulin. GDM management included education on the increased risk of developing diabetes; the silent nature of the disease and the need for follow-up screening.

Even though universal screening via an oral glucose tolerance test (OGTT) was recommended practice in Tonga, it did not always happen. Glucose supplies were not part of the Tongan Ministry of Health's budget but were funded by the World Health Organization (WHO) which had an office in Tonga. Supplies often ran low which necessitated selective screening. This was viewed as a major problem as most Tongan women had modifiable risk factors for GDM (especially overweight); the criteria used to selectively screen women at risk.

Problems related to lack of follow-up screening for both Type 2 diabetes and GDM emerged as a common theme. Most women post partum GDM reportedly do not attend for follow-up screening appointments. Likewise, many Tongan people presented to the clinics with advanced stages of diabetes, despite a variety of strategies that were in place to remind people to turn up for their appointments. *'Screening is a foreign idea for most Tongans—they have the idea that if you are well you do not need to go.... [to the health service]...you only go if you are sick'*.

Considerations of GDM as a significant “warning signal” for the prevention of Type 2 diabetes—Because of the high prevalence of diabetes in Tonga, most women were thought to be already very aware of the disease; to know someone, or care for someone with diabetes at home. All health professionals viewed diabetes as the most significant health problem in Tonga yet did not think GDM was a significant warning signal for women for developing future diabetes.

Key issues regarding weight, diet and physical activity—Weight gain in the first pregnancy was seen as a serious issue for pregnant women; weight not lost between pregnancies, coupled with idleness, contributes to obesity which increases the risk of another GDM pregnancy and future Type 2 diabetes. Because of high rates of obesity in Tonga, ante-natal advice provided women with GDM was often to start being active during pregnancy and to lose weight when they become pregnant; which reportedly was in contrast to ante-natal guidelines in other countries.

Laziness was identified as a contributing factor to high levels of overweight, poor diet and lack of physical activity in Tonga; *'too much sitting around, doing nothing and eating'*. Health professionals referred to the changes in Tonga over the last twenty years such as more cars; more unhealthy take-away food options and less eating and cooking of healthy traditional foods. *'No-one walks now—lots of people have cars and they even drive to church and around the corner.'*

Current health promotion programmes on the radio that focused on nutrition and physical activity and exercise programmes supported by the Tongan Ministry of Health were seen as effective tools for delivering messages on healthy weight, healthy eating and the importance of being physically active.

Discussion

The purpose of this qualitative study was exploratory and the findings are only applicable to the study participants. The interviews enabled contextual insights into GDM and diabetes in Tonga and this subjectivity is integral to meaningful qualitative data.⁹ Even though the women with GDM could speak English, a translator may have facilitated deeper responses and encouraged more women to participate in interviews.

Most women in this study had common risk factors for GDM: a relative with Type 2 diabetes (many first degree relatives); age over 35 years; overweight and belonging to a high-risk population.¹⁰ Obesity and physical inactivity are particularly prevalent risk factors for Tongan women.¹¹

Screening via an oral glucose tolerance test for GDM was seen by the health professionals as a cost-effective strategy but lack of funding for supplies precluded universal screening in Tonga. Financial commitment to enable universal screening is a

cost-effective investment and relatively easy way to identify and target women^{12,13} who have a substantial risk of developing Type 2 diabetes in Tonga.

Preventative screening was reported to be a foreign idea to Tongan people and ongoing monitoring in the post-partum period was basically non-existent. As stated by Colagiuri et al the high rate of undiagnosed Type 2 diabetes most likely reflects a lack of available routine medical services in Tonga; a lack of community awareness of diabetes and the 'prevailing attitude of seeking medical advice only for advanced problems'.^{4,p.1382} Women would clearly benefit from a greater awareness of glycaemic symptoms to allow early self-referral with education that diabetes frequently occurs in the absence of symptoms, hence the importance of regular blood glucose checks.¹⁴

Following a diagnosis of GDM women's major concerns were for the baby. Adverse delivery outcomes and perinatal morbidity are supported by evidence of the risks involved for mother and baby with a pregnancy complicated by GDM.^{15, 16} It was not clear from this research if and how these or any other concerns specifically influenced behaviour change.

Changes to Tongan culture and influences brought about by increasing westernisation, globalisation, urbanisation and economic factors¹⁷ have negatively impacted on diet, physical activity and obesity in Tonga. Complex social and economic change¹⁷⁻²⁰ has contributed to reduced physical activity, changes in manual employment and an increase in the availability of high-fat, energy foods. Since the mid-90's imported foods which are relatively expensive compared to traditional foods^{11,21} are eaten more and have contributed to high rates of obesity in Tonga. 'Laziness' was seen to contribute to obesity and physical inactivity. Increased urbanisation contributes to decreased levels of physical activity and higher rates of obesity²² in Tonga, despite the fact that many residents continue to have some rural component to their lives.⁴

Obesity, particularly triggered by weight gain during the first pregnancy was reported to be a significant risk factor for GDM and diabetes. Preventing obesity in young women²³ combined with interventions on effective nutrition and physical activity that produce weight loss, targeted at women who develop GDM are needed to postpone or prevent the development of Type 2 diabetes.²⁴⁻²⁷ Lifestyle interventions have been shown to delay or prevent the development of diabetes²⁸ particularly in overweight women.^{25, 29}

Whilst GDM was reported to be effectively managed in Tonga through lifestyle education and diet-control, sustained compliance to lifestyle changes will only be achieved if women understand the potential benefits to be gained through changes to diet and physical activity levels.^{30,31} Tonga has its own particular deterrents and barriers to physical activity and good nutrition.³² McCarty and Zimmet maintain the 'promotion of healthy lifestyles, while respecting local culture, poses an enormous challenge but it is essential to optimize health for all Pacific Islanders'.^{6,p.243}

Participants commented positively on broader public health programmes in Tonga that delivered healthy lifestyle messages. Preventing chronic diseases including Type 2 diabetes and obesity is on the political, economic and health agenda of the Tongan Ministry of Health.^{33,34} Diabetes was identified as the main public health issue in Tonga for all participants. Given that complications associated with diabetes, particularly severe diabetic foot damage are common in Tonga⁴ it was understandable

that fear of developing diabetes including amputation was mentioned as a concern in the interviews with GDM participants. GDM, however, was not seen as a warning signal for the development of Type 2 diabetes in Tonga.

Conclusion

The results of this exploratory research provide some insight into the complexity of issues related to GDM and Type 2 diabetes in Tonga. Even though there was evidence of the effectiveness of lifestyle recommendations to manage GDM, there is a challenge in Tonga to support women who experience GDM to minimise their risk of developing future diabetes which needs to extend to the postpartum period.¹⁴

Ongoing education on the symptoms of diabetes and the importance of screening even when there are no apparent symptoms of diabetes is needed²⁰ to raise awareness of the significant risk women who experience GDM have of developing Type 2 diabetes. Financial commitment is needed to ensure all women in Tonga are screened for GDM.

There are clear implications for lifestyle intervention targeted towards reducing obesity and encouraging physical activity of women in Tonga, both during pregnancy and in the postpartum period to curb the incidence of GDM and Type 2 diabetes for this high risk group of women. A further in-depth study of this type by a Tongan researcher would provide needed insight on screening and comprehensive care to this group of women.

Competing interests: None.

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