

P326 - The effect of compliance during exclusive enteral nutrition on faecal calprotectin levels in children with Crohn’s disease

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Background

It is unclear whether suboptimal response to exclusive enteral nutrition (EEN) in some children with Crohn’s disease (CD) is explained by poor compliance¹. All proprietary feeds used for EEN are gluten-free² ; hence patients’ compliance to EEN could be determined by detecting gluten immunogenic peptide (GIP), a biomarker of gluten intake³, in faeces.

Methods

The concentration of GIP was measured in the faeces of 45 children (aged 3-17 years) with CD prior to and during treatment with EEN. Patients were deemed fully compliant to the 8-week course of EEN via clinical dietetic review.

Associations with faecal GIP and faecal calprotectin (FCAL) levels were explored at 33 and 54 days of EEN, where patients with detectable or undetectable GIP were classed as GIP “Positive” or GIP “Negative”, respectively.

Differences in FCAL concentrations between groups were assessed via general linear model and Box-Cox transformation; pairwise differences were reported with Tukey post-hoc test.

Table 1: Participant characteristics and clinical data across timepoints.

	Baseline		33 days		54 days	
	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)
Age, Mean (SD) years	45	12.3 (3.08)	45	12.3 (3.08)	45	12.3 (3.08)
Height z-score, Mean (SD)	45	-0.1 (0.92)	27	-0.19 (0.95)	40	-0.15 (0.88)
BMI z-score, Mean (SD)	45	-0.56 (1.22)	28	-0.41 (1.02)	40	0.13 (0.77)
FCAL, Mean (SD) mg/kg	40	1450 (527)	39	921 (590)	35	747 (669)
wPCDAI, Mean (SD)	45	41.2 (22.2)	N/A		45	8.61 (10.6)
Males (%)	45	67	45	67	45	67
Short Stature (%)	45	0	25	4	30	0
Underweight (%)	45	10	26	4	30	0
Raised ESR (%)	37	46	N/A		30	30
Low Albumin (%)	44	48	N/A		30	7
Raised CRP (%)	41	51	N/A		27	18
Detected GIP (%)	40	93	39	13	35	23

Short Stature defined as height z-score <-2; Underweight defined as BMI z-score <-2; Raised ESR defined as >20 mm/hr; Low albumin defined as <35 g/L; Raised CRP defined as >7 mg/L; wPCDAI= weighted paediatric Crohn’s disease activity index, ESR= erythrocyte sedimentation rate, CRP= C-reactive protein, GIP= gluten immunogenic peptides.

References

1. Van Limbergen J, Haskett J, Griffiths AM, et al. Toward enteral nutrition for the treatment of pediatric Crohn disease in Canada: a workshop to identify barriers and enablers. Can J Gastroenterol Hepatol 2015;29(7):351-6.
2. Logan M, Gkikas K, Svolos V, et al. Analysis of 61 exclusive enteral nutrition formulas used in the management of active Crohn’s disease-new insights into dietary disease triggers. Aliment Pharmacol Ther 2020;51(10):935-47.
3. Comino I, Real A, Vivas S, et al. Monitoring of gluten-free diet compliance in celiac patients by assessment of gliadin 33-mer equivalent epitopes in feces. Am J Clin Nutr 2012;95(3):670-7.

Results

GIP was present in 37 of the 40 (93%) patients who provided stool samples prior to starting EEN, indicating typical gluten consumption in CD patients (Table 1). In patients with undetectable GIP at both 33 and 54 days of EEN, FCAL significantly decreased from baseline (mean decrease, 33 days: -743mg/kg, 54 days: -1043mg/kg, p<0.001), but not in patients who had detectable GIP. At EEN completion, patients with undetectable GIP had a lower FCAL by 763mg/kg than patients with a positive GIP result (p=0.041) and demonstrated a greater decline from baseline FCAL (-69% vs +5.%, p=0.021). In regression analysis, the absolute concentration of GIP at 54 days of EEN was a significant predictor of FCAL levels (R²=9.5%, p=0.04).

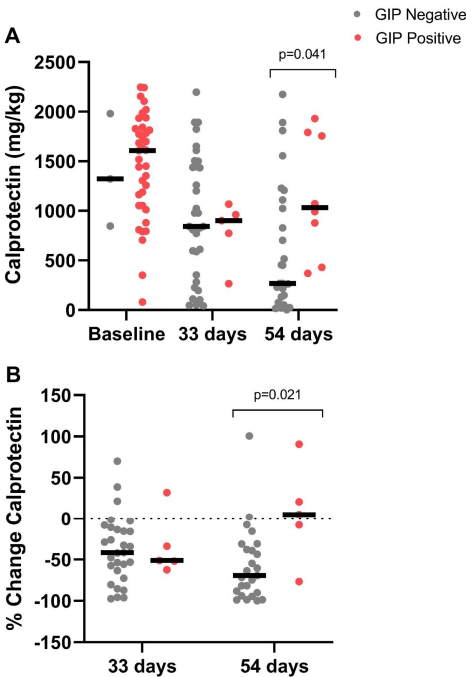


Figure 1: Individual value plots of faecal calprotectin concentration (A) and % change faecal calprotectin from treatment initiation (B) at 33 and 54 days of exclusive enteral nutrition stratified by negative and positive faecal gluten immunogenic peptide (GIP). Black horizontal bars represent the median.

Conclusion

Poor response to EEN might be explained at least in part by diminished compliance and dietary transgressions. Faecal GIP may be useful as a proxy biomarker of EEN compliance.