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Celiac Disease in Children – A Profile from a Predominantly Rice Eating Population

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Introduction

India had entered into the global scenario of celiac disease with Northern India being the celiac belt. But prevalence studies are lacking from the Eastern part of India.

Keywords: Celiac disease; Anti-endomysial antibody; IgA-deficiency; Duodenal biopsies; Chronic abdominal pain

Abbreviations:

CD: Celiac Disease; Ig: Immunoglobulin; tTG: Tissue Transglutaminase

Methods

A retrospective study was undertaken where the case files of 720 children, who were screened for CD between the years 2011 to 2015, from three tertiary referral centres of Kolkata, were analysed. Blood tests for serum IgA level and anti tTG-IgA antibody were used at screening. All children found positive for anti tTG-IgA antibody at screening were subjected to endoscopic duodenal biopsy after informed consent.

Results

A total of 50 children aged 1 – 14 years were found to be anti tTG IgA positive. In 42 children, the anti tTG IgA antibody was positive in a titre more than 6 times of the normal limit (normal < 20 U/ml). Three children were found to have IgA deficiency, and anti endomysial antibody (EMA) IgG showed a high value suggesting the diagnosis of CD (**Table 1**).

Celiac genetics were done for the three children with IgA deficiency. 2 were HLA DQ2 positive and one was DQ8 positive. All 50 children underwent endoscopic duodenal

biopsy (D1 and D2). In 45 children (25 male, 20 female) duodenal biopsies were suggestive of Celiac Disease (Marsh classification II and above), with adjusted prevalence at 5.83%. Prevalence of IgA deficiency was observed to be 0.42% among the children studied, and 6% among children with CD [1-4].

Table 1 Distribution of patients according to age group (n=45), (Male=25).

Age Group	No. of Anti tTG +ve	IgA deficiency and Anti EMA IgG +ve
1-4 yrs	10	1
5-10 yrs	21	2
11-14 yrs	11	-

On analysis of clinical profile diarrhea was presenting feature of 8 children (17.78%), diarrhea with failure to thrive was presentation of 9 (20%). Failure to thrive and anemia (independently as sole manifestation) were observed in 8 (17.78%) and 4 (8.89%) children respectively. Impaired liver function test (n=3), constipation with bloating (n=4), chronic abdominal pain (n=5) and delayed puberty (n=4) were other manifestations (**Table 2**).

Ethnic origin analyses showed 13 (28.9%) patients were from Uttar Pradesh, 7 (15.5%) from Bihar and Rajasthan each, and the remaining 18 (40%) from native Bengal (**Table 3**).

Discussion

The true prevalence of celiac disease in India is not well known. Symptomatic celiac disease is just the tip of the iceberg in India. Because of the widespread availability of the simple and accurate serological tests the hidden celiac disease groups are getting explored.

Table 2 Different clinical presentations of celiac disease.

Age group	Persistent or recurrent diarrhea	Failure to thrive	Failure to thrive with diarrhoea	Anaemia	Delayed puberty	Constipation & bloating	Abdominal Pain	Impaired LFT
1yr-4yrs	2	3	2					
5-10yrs	4	4	7	3		2	3	3
11-14yrs	2	1		1	4	2	2	
	8 (17.8%)	8 (17.8%)	9 (20%)	4 (8.9%)	4 (8.9%)	4 (8.9%)	5 (11%)	3 (6.6%)

Table 3 Ethnic origin of patients.

Ethnic Origin	No (Percentage)
Bengal	18 (40%)
Uttar Pradesh	13 (28.9%)
Rajasthan	7 (15.5%)
Bihar	7 (15.5%)

1. Regional differences are observed depending on genetic, immunological and dietary habits that is the wheat-rice shift from north to the south in India [1]. In various Indian studies, the prevalence of CD in children with mal-absorption and chronic diarrhea ranged from 6.8% to 26%
2. The only Indian study on population screening in children for CD gives a prevalence of 1 in 310.
3. Another study from northern India showed the prevalence of CD to be 1% among children aged between 6 months to 12 years of age attending pediatrics department of a tertiary care hospital.
4. Both these studies did not estimate the serum IgA and probably had missed true cases of celiac disease with IgA deficiency.

No study is documented from Eastern India till now and this study is an eye opener. It is not the true prevalence. However,

the fact, that 40% of affected children are from Bengali population, warrants further community studies including genetic studies in rice-eating native population.

Conclusion

Our study from children in East India shows a much higher prevalence at 5.83% but do not take into account the racial differences among these children. It is unlikely to be the true prevalence but since about 40% of the CD affected children are from Bengali population, this warrants further community and genetic studies in the rice-eating native population.

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