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Original Research Article

Short stature as a significant marker in celiac disease

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ABSTRACT

Background: Celiac disease (CD) is a genetically determined gluten-sensitive enteropathy resulting in nutrient malabsorption, can have extra gastrointestinal tract (GIT) presentations, short stature may be the only presenting clinical feature, even in the absence of gastrointestinal symptoms. The aim and objective of this study was to
Methods: This cross-sectional study was performed on 1000 children between ages 5 to 10 year of different schools, in Jaipur, district of Rajasthan. An anthropometric measurement (height, weight) was done for all children. Serum samples were analyze for IgA antibodies to human tissue transglutaminase (tTG) with lower detection limit of 1.0 U/ml and 15 U/ml. Positive samples for tTG antibodies were reanalyzed human endomysial autoantigens (EmA).
Results: Out 1000 children screened, six were seropositive, of those four were females and two were males. The serological proportion of CD in this population was 1:166. These Six seropositive group tends to have lower height, weight than the seronegative group, but the difference was only significant for height (P=<0.01).
Conclusions: Although gastrointestinal manifestations are important presentation of celiac disease, nevertheless short stature alone or in combination with other symptoms of celiac disease has been present.

Keywords: Celiac disease, Gluten-sensitive enteropathy, Seronegative**,** Seropositive, Short stature, Tissue transglutaminase

INTRODUCTION

Until approximately a decade ago, celiac disease was considered uncommon even in the Western world, with a prevalence of 1 in 1000 or lower.[1] These estimates were based solely on case acquisition studies alone hence a gross underestimation of the true disease. Recent studies from Europe and America screening healthy populations have reported the disease to be more common than previously realized, with prevalence reported between 1in 300 persons.

The disease has also been considered uncommon in India until recently, Hospital records, however, have revealed an increasing trend of the disease in predominantly wheat-eating areas of North India.

Recently large number of celiac patients has been detected from our state Rajasthan, majority of patients have been detected from Jaipur, Jodhpur, and Bikaner. The increase Incidence is primarily due to increased consumption of wheat as a staple diet all over Rajasthan in last 3-4 decade and native cereals and millets like Maize, Jowar, Bajara and largely replaced by the newer hybrid of wheat and also due to availability of highly sensitive (93%) and specific (99%) serological test for screening and epidemiological purposes and so also due to the availability of specialists in pediatric

gastroenterology with endoscopy facilities in most of the institutions and private hospitals all over India.

The aim of this study was to estimate the proportion of CD using serological markets among a group of children aged 5 to 10 years in JAIPUR City, and to compare height, weight, and body mass index in the seropositive group to the seronegative group.

METHODS

It is cross-sectional study was carried out in Jaipur, district of Rajasthan, Northern India. Between October 2011 to September 2012, 1000 children between 5-10 years of age attending different schools in the district were enrolled.

An anthropometric measurement (height, weight) was done for all children. None of the participants was reported to have CD. Serum samples were analyzed in duplicates for IgA antibodies to human tissue trans glutaminase (tTG) using enzyme linked immune sorbent assay (ELISA). The test has a lower detection limit of 1.0 U/ml and 15 U) ml was the cut-off point for positive result. Positive samples for tTG antibodies were reanalyzed with commercial ELISA for IgA auto-antibodies to human endomysial autoantigens (EmA).

The analytical sensitivity of this test was 3U/ml and the cut-off value were 20 U/ml. out 1000 children screened, 6 of them were found positive for celiac disease. Inclusion criteria was, school going male and female children of age group 5-10 years. Exclusion criteria was, previously diagnosed cases of celiac disease. Appropriate statistical analysis was applied. ALL the date would be entered on Excel sheet and analyzed statistically suing XL-stat software. Quantitative data-would be summarized in form of mean±SD.

RESULTS

The study was carried out in the school's children in Jaipur city. In present study Between Oct. 2011 to Sep.2012, 1000 children between 5-10 years age attending different schools both Govt and Private school in the district were enrolled.

Table 1: Different study result.

Country	Age (Years)	Number	Antibody	Prevalence	Reference
United Kingdom	7.5	5470	tTg, IgA Ema	1:101 (1.0%)	Bingley et al, [2]
The Netherlands	2 to 4	6127	IgA	1:82 (1.2%)	Csizmadia et al,[3]
The USA	2 to 18	1281	IgA EmA	1:320 (0.3%)	Fasano et al,[4]
Finland	7 to16	3654	Iga EmA and IgA tTG	1:73 (1.4%)	Maki et al,[5]
Turkey	Adult blood donor	2000	IgATG	1:87 (1.1%)	Tatar et al,[6]
North American and western Europe	Children	Large population	Biopsy	0.5% -1.6%	AHRQ No.104 CD[1]
Jordhan	5.5 9 to 9.5	1985	IgA tTg and IgA Ema	1:124	Nusier et al,[7]
Punjab India	3 to 17	4347	IgA tTG and Biopsy	1:310	Sood et al,[8]
Jaipur	5to 10	1000	IgA tTG, IgA Ema	1:166	Current study

Among 1000 children, 457 were female (mean age 8.49) and 543 were male (mean age 8.38). There was no significant difference between both sex ratios in study population. There was no significant difference in height (P=>0.05), weight (P=>0.05) and BMI (P=>0.05) between both sexes.

There was no significance difference about sex ratio in tTG test. After ItG IgA positive six children are reanalysis by tTG test and again six positives are confirmatory done by IgA EmA test.

Six were seropositive, of those four were females and two were males. The serological proportion of CD in this population is 1:166 In worldwide there are different studies carries out and different prevalence find by different author (Table 1).

None of the children had been previously diagnosed as having type I diabetes mellitus or other autoimmune disease. There was no family history of celiac disease among any of the school children.

These Six seropositive group tends to have lower height, weight than the seronegative group, but the difference was only significant for height (P=<0.01) (Figure 1).

The growth parameters in the seropositive boys were generally lower than those in the seropoiositive girls.

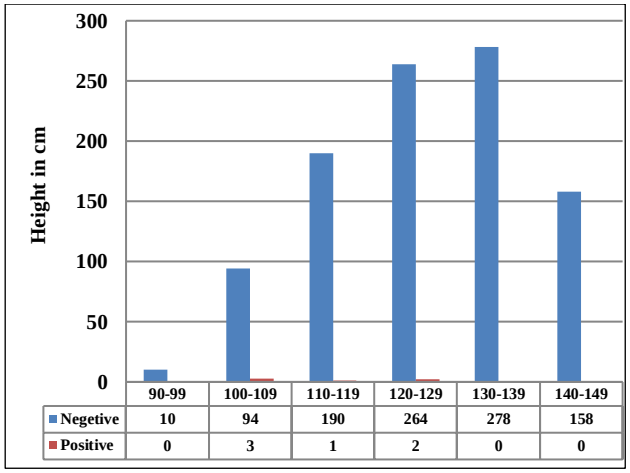

Figure 1: Comparision of height in seropositive and seronegative children.

DISCUSSION

Celiac disease now a days is not an uncommon disease in India and the exact incidence and prevalence of disease is not known because of several reason, like low index of suspicion of disease, varied clinical presentation of disease and scarcity of specialized medical personal and high prevalence of co-morbid condition like tuberculosis, protein energy malnutrition and various chronic illness etc. and there by posing a great diagnosis dilemma in this part of the world. The worldwide serological prevalence of CD ranges from 0.3% to 1.4% and the proportion of Celiac Disease of this study 1:166 is in agreement with previous screening studies. A school survey from North India reported a frequency of celiac disease to be one in 310 children.[8] In previous study, out of 200 Patient with chronic diarrhea 48 (24%) were diagnosed as CD, on the basis of modified ESPGAN criteria at our own center SPMCHI, Jaipur in 2004-2005. During 2003-2004 a study conducted at our center has shown a prevalence of about 34% (104/300) among children with chronic diarrhoea, failure to thrive, short stature and anaemia. During 2005-2006 a study conducted at center has shown a prevalence of about 35.7% among children with failure to thrive, short stature, anaemia, constipation and unusual manifestations. Till now 1196 cases have been registered at own Center SPMCHI, Jaipur. The present study was revealed celiac disease per se as one of important cause of short stature, but this fact is substantiated by a number of factors.

- Mono-symptomatic presentation.
- Low index of suspicious.
- Lake of widespread availability of sensitive and specific serological test, such as endomysial antibody (IgA) and tTG IgA.
- Lake of specialized personnel to perform endoscopic biopsy.

Author believe that celiac disease, must have been an important cause of secondary malnutrition. Note that among the reported previous Indian series on short stature, none had reported CD as a cause of short stature expect Bhadada S, Bhansali A et al, at PGI Chandigarh who reported Celiac disease as most common cause of short stature (15.3%) among 176 children with evaluated between 2005-06. [9] In another selected population of short children. Rosenbach Y et al, report celieac disease in 48% of those studied.[10] They recommend: "children with short strature of unknown cause and bone age retardation should be evaluated for the presence of celiac disease." Cacciari et al, reported another study of 88 children with short strature in 1985 would suggest a total of 16 of 88 short children with Probable celiac disease, they state.[11] "symptomless celiac disease is therefore a commoner cause of short strature than is hypopituitarism." Bhadada S, Bhansali A et al, studied 176 patients, half male and half female, who fit the criteria for short stature out total children studied celiac diseases was found in 27 (15.3%). of the patient, making it the single most common cause of short stature. In present studies it was noted that seropositive group compare seronegative groups signficatnt low height. So symptomless celiac disease is therefore a commoner cause of short stature. The Agency for Healthcare Research and Quality (AHRQ) report found a prevalence of CD in children by biopsy of 0.5% to 1.6% and by serology of 0.3% to 1.9%. Even though. The gold standard for the diagnosis of CD is duodenal biopsy, recent reports have shown that tTG alone is a sensitive market for CD, yet non-invasive. tTG is the market of choice for CD mass screening and helpful in identifying patients who can benefit from gluten free diet and follow up. The serology test results can be interpreted in different ways.

CONCLUSION

Celiac disease is not an uncommon disease in India, where wheat is a staple diet and it may represent 'the tip of iceberg. The common conception that celiac disease of west does not seem to stand true. Although gastrointestinal manifestation is important presentation of celiac disease, nevertheless short stature alone or in combination with other symptoms of celiac disease had been reported by many workers in recent years. The main observed in our study were seropositive group tends to have lower height, weight, than the seronoegative group, but the difference was only significant for height (P=<0.01). The growth parameters in the seropositive boys were generally lower than those in the seropositive girls.

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