PREVALENCE OF COELIAC DISEASE IN INDIA:
A MINI REVIEW

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Abstract-Celiac disease (CD) is a syndrome which is distinguished by damage of the small intestinal mucosa caused by the gliadin fraction of wheat gluten and similar alcohol-soluble proteins (prolamines) of barley and rye in genetically susceptible subjects. In the current scenario, diagnosis of CD is exceedingly challenging and only treatment so far is lifelong gluten free diet. In the last decade, latest epidemiological studies have provided substantial evidence that the prevalence of coeliac disease is also common in many developing countries indicating that CD does indeed have a worldwide distribution. Thus considering these points, this review article aims to discuss current scenario of coeliac disease in India, its treatment and future outlook.

Keywords – Coeliac Disease, Gluten Free Product, India

I. INTRODUCTION

Celiac disease (CD) is an autoimmune disease that is characterized by an aberrant response to dietary gluten in genetically susceptible individuals that results in small intestinal injury and can be associated with diverse systemic consequences [1]. In the past decade, due to increasing number of Indian Paper in the area of coeliac disease, it can be inferred that there is a considerable interest in the epidemiology of CD in India [2-5]

Although awareness about coeliac disease in India is increasing, the prevalence of CD in the Indian subcontinent is still not clear but is likely to be progressively increasing. In one of the past study, the selective serological screening of 198 symptomatic schoolchildren out of 4347 subjects in Punjab, North India, yielded a CD prevalence of at least 1 in 310 in the overall sample [2]. In another such study, 169 first-degree relatives (66 parents, 71 siblings and 32 children) of 53 were screened by using anti tissue transglutaminase antibodies[6]. Duodenal biopsy was performed in all seropositive relatives and graded as per Marsh classification. The result indicated that the prevalence of celiac disease among first-degree relatives was 8.2% (14/169). The prevalence of celiac disease among siblings (15.6%) was much higher as compared to that in parents (3.5%) and offspring (3%). Thus on the basis of the study it was concluded that Familial prevalence of celiac disease in North India is similar to the data from the West. However unlike the situation in the West, the overwhelming majority of first-degree relatives in India are overtly symptomatic with majority having chronic diarrhoea. Thus in future, need for further studies is needed to determine the familial prevalence in India in view of genetically diverse population in this country. However considering many cases of CD remains undetected; it clearly indicates the number is still underestimated to some degree. India being highly populated country in the world with its enormous cultural diversities, the distribution of the genetic and environmental determinants of CD in India have shown a distinctive features in the last few years [6, 7].

During the recent years, it has been shown that, in wheat-consuming states such as Punjab, Haryana, Delhi, Rajasthan, Uttar Pradesh, Bihar and Madhya Pradesh , prevalence of CD in predominantly higher on an epidemiological basis [8].Studies on occurrence of coeliac disease in Uttar Pradesh as well as from delhi have indicated its similarity with the European susceptibility patterns [4, 9]. However, past studies indicate that there is difference of prevalence of coeliac disease in northern and southern part of India [10, 11]. Thus the regional difference of CD occurrence in India could be conceivably related to the genetic differences integrated with variation in staple diet pattern (wheat in north India and rice in south India). This finding in the recent work could possibly help to understand the reason behind the prevalence of CD mostly in Northern part of India. The situation might change in the coming time due to increasing shift in the diet pattern and inclination towards westernization. In the last decade, there is a steadily rise of per capita consumption wheat-based products coupled with rising income and urbanization. Thus considering there trend at present, an increasing incidence of CD in India can be expected in the near future.

Past Studies have indicated that Prevalence of Celiac disease in India occurs more often in children than in adults [12-16]. As compared to the last decade the awareness of CD in India has been improved considerably. For Example, reported cases in the year 1966–2000 were as compared to 517 in 2001–2005. One of the critical and prime reasons for increase in the awareness is due to the advancement in the approaches to Diagnosis and treatment of Celiac Disease. Even with the advancement of research in CD, diagnosis of CD is still extremely challenging and still needs additional research at the global frontier. In the last decade, serologic tests have been developed that has provided a non-invasive tool to screen both individuals at risk for the disease and the general
population [17]. However, the current gold standard for the diagnosis of CD remains histologic confirmation of the intestinal damage in serologically positive individuals. The key treatment of CD patients is a lifelong elimination diet in which food products containing gluten are avoided.

**Fig 1** The Ice Berg Model - Adapted from [17]

The epidemiological changes of CD are adeptly gestated by the iceberg model as shown in the Fig. 1. This idea was originally introduced by Richard Logan in 1991 [18]. A substantial number of cases of CD are timely diagnosed due to the suggestive complaints (e.g., chronic diarrhoea, unexplained iron deficiency) or other reasons (e.g., family history of CD). These cases make up the visible part of the celiac iceberg, in quantitative terms expressed by the incidence of the disease. However, it has been reported that for each diagnosed case of CD, an average of 5–10 cases remain undiagnosed screening studies in Western countries. The submerged portion of the iceberg typically forms the area where CD remains undiagnosed. Particularly, in India due to the lack of both laboratory equipment and personnel trained in CD diagnosis the frequency of CD is currently underestimated.

During the last 5 decade, the diagnosis of CD has evolved due to the better understanding of the clinical presentation of the disease and the advent of more sensitive and specific diagnostic tools and confirmative tests [17, 19]. The diagnosis of CD is based on 3 key parameters: (1) case identification, (2) screening tests, and (3) definitive tests.

CD meets the World Health Organization (WHO) criteria for diseases that warrant mass screening: early clinical detection is difficult; the condition is common; screening tests are highly sensitive and specific; effective treatment is available; and untreated disease can lead to complications. Currently due to the emergence of innovative serologic screening tests, a reliable screening test for diagnosis of CD has been established [20]. Serological evaluation is the initial step in diagnosing CD and may be helpful in monitoring adherence to a gluten-free diet [20, 21]. The antigliadin antibody (IgG, IgA) was the first serological test developed for the diagnosis of CD in the early 1980s. Antibody testing is the first step in diagnosing patients with CD. However due to the low positive predictive value both IgG and IgA antigliadin antibody testing are no longer recommended to diagnose CD. Currently, Deamidated gliadin peptide (DGP) antibody testing is recommended for use in IgA-deficient patients to diagnose CD and in the paediatric population. Serological markers for CD normalize after 6–12 months of adherence to a GFD, though this rate is variable. Histological changes that characterize CD can persist despite normalization of serological markers.

As far as treatment of coeliac disease is concerned, total lifelong abstaining of gluten ingestion remains the cornerstone treatment for the disease currently. **Fig 2** suggests the general guidelines for the CD diet. However, the gluten free diet requires incessant education of patients and their families by both doctors and dieticians so that individual can lead a healthy life style. Regional CD support groups are instrumental sources of information and support. However, there are controversies in context to the concentration of gluten allowed in the diet of CD patients. For example, the National Food Authority has recently redefined the term “gluten-free.” Previously, 0.02% gluten was considered gluten-free, but gluten-free now means no gluten, and 0.02% is currently labeled “low gluten.”

**Fig 2** General Guidelines for the CD diet

II. CONCLUSIONS

In conclusion it can be said that the delusion that CD is the disease of only European countries as well as other Western countries are not really accurate. In India at present there is a enormous need to spread awareness about the disease with focusing on recognition of all the subtypes of CD including typical, atypical and silent subjects, and all age groups including infants following supplementation with wheat-containing diet. The rate of prevalence rate of CD may be higher than in any Western country. However, additional research and clinical studies among different population could help to analyze other dimensions of the disease in India.
Early recognition of CD will definitely have a direct impact on the burden of childhood morbidity and mortality.

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REFERENCES