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Brief Report

BRIEF REPORT

The surprising 'Coeliac Chinese box' from Italy

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Background

Coeliac disease (CD)—an autoimmune systemic disorder elicited by gluten in genetically predisposed individuals—can be considered a major public-health issue. Its prevalence is increasing in areas such as Asian countries. The global seroprevalence of CD is 1.4%, the highest being in Europe and Oceania, and very low in Southern America; however, few data are available for Asian countries, especially for China [1]. Historically, CD has been considered uncommon in the Asian continent but, through diagnostic advances and the rising interest in and awareness of the disorder in this area, it is becoming clear that Asia is a major reservoir for undiagnosed CD. In this paper, we would like to focus the attention on the possibility of CD in children of Chinese descent living in Italy by discussing two cases of Chinese girls, both born in Italy, who have come to our attention via two different diagnostic strategies: case-finding and mass screening.

The first child is a 6-year-old girl, born in Italy from an Italian mother and a Chinese father, from Liaoning, a north-eastern Chinese province (Figure 1). She presented with abdominal pain, constipation, and migraine. She had multiple positive screenings for CD [anti-tissue-transglutaminase antibodies (Ab-tTG) IgA-positive, anti-endomysial autoantibody-positive], genetic predisposition (DQA1*05–DQB1*02) and histological damage, limited to the bulb (Marsh-Oberhuber 3b–3c). Following her CD diagnosis, her parents also performed human leukocyte antigen (HLA) typing which showed that her mother did not carry any of the alleles predisposing for CD, whereas the father was HLA-DQ2-positive, which was quite unexpected, knowing the low reported prevalence of predisposing genetics and disease in China compared to those in Italy.

The second is the case of a Chinese girl diagnosed during primary-school mass screening in Rome, Italy. As part of an Italian multicentre diagnostic screening project, 1,141 children attending primary schools in Rome were recruited. Children enrolled were typified for HLA DQ2/DQ8; those with at-risk genetics underwent further screening for auto-antibodies (Ab-tTG IgA). The prevalence of Chinese ethnicity was 0.70% (8/1,141); only four out of eight families consented for HLA typing. At-risk genetics was identified in two children (one male). Among these children, one 10-year old girl (DQA1*05–DQB1*02) had positive screening (Ab-tTG IgA and EMA IgA) and mucosal damage (Marsh-Oberhuber 3b–3c), with histological lesions observed only in the bulb. She showed no symptoms and her growth was regular. Her mother has the same genetic pattern and is affected by autoimmune thyroiditis. Both her parents are originally from Zhejiang, a coastal region in eastern China (Figure 1).

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Figure 1. Map showing the regions of origin of the two families described in the article. The regions in red and in green are Liaoning Province and Zhejiang Province, respectively, in China. The course of the Yangtze River is shown in blue.

Thus, the diagnosis of these two girls could be confirmed and they both started rigorous adherence to a gluten-free diet.

Discussion

First description of CD in children of Asian descent immigrating to Western countries such as England [2, 3] was later described in an Italian multicentre study as well [4]. Considering how these children share the same environment and dietary habits as Italian children, it could be appropriate to wonder about the role of gluten in the development of CD in Western countries. On the other hand, several recent studies [5–7] show that the prevalence of CD in China could be more common than previously estimated and continuously on the rise. It seems to display a definite regional distribution, with northern regions showing a prevalence $\leq$12 times higher than that in southern areas [6, 7]. A 'Yangtze belt' mimicking the so-called 'coeliac belt' described in India can be imagined. In fact, these findings can be explained by the co-localization of gluten consumption and predisposing HLA at the population level: the Yangtze River has been identified as a sort of demarcation line between North and South, and the HLA-DQ2 antigen and the DQB1*02 allele have both been shown to have a higher frequency in the area north of the river, possibly due to a higher flow of Caucasian genes to northwest China [7]. The consumption of gluten-containing foods also shows a parallel pattern, with the north relying more on wheat (dumpling and noodles) than the southern area, where rice is the dietary staple. A rapid and gradual Westernization of the diet is also reported in Far East countries, with an ever-increasing consumption of gluten-rich foods [8]. This allows a progressive increase in the incidence of CD in China to be expected in the coming years, which must be faced with proper increases in awareness and diagnostic modalities. Moreover, both girls described in this paper had family native to the eastern area of the country, outside the previously mentioned 'Yangtze belt' (Figure 1). This could indicate a changing distribution in the aforementioned co-localization of genetics and gluten consumption as families, and therefore lifestyles and genetic pools, move throughout the country, thus leading to a further future shift in the epidemiology of this disorder.

Finally, though we acknowledge the possible difficulties in performing a mass screening, we would like to highlight its importance in identifying cases that would never come to light with the more accepted diagnostic strategy of case-finding. In fact, the regular growth (90th percentile for both height and weight), the absence of symptomatology, and the Chinese descent of the second girl would probably never have prompted a CD screening, while we easily identified her via mass screening.

Conclusion

After considering the newly emerging data concerning CD prevalence in China and its expected increase in the coming years, the multiple reports on offspring of Chinese parents raised in Western countries and the experience of a diagnostic screening, during which one out of four screened children of Chinese descent was identified as a non-diagnosed CD patient, we would like to emphasize the need to investigate CD in Chinese children, as many have already done. Our data also show that the CD-predisposing genes are represented even in areas of China that were previously thought to be low-risk.

We also advocate the importance of mass screening in the diagnosis of CD, as it could allow the early identification of affected individuals even when case-finding would not have allowed a timely suspect and diagnosis, such as the asymptomatic or the low-risk categories.

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Conflicts of interest

None declared.

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