

## Celiac Disease and Anemia

SANTOSH KUMAR MITTAL<sup>1</sup> AND MALOBIKA BHATTACHARYA<sup>2</sup>

From the Departments of Pediatrics, <sup>1</sup>Chacha Nehru Bal Chikitsalya, Delhi;

and <sup>2</sup>Government Institute of Medical Sciences, Greater Noida, UP; India.

<sup>1</sup>skmittal44@yahoo.com

Celiac Disease is an autoimmune enteropathy caused by exposure to dietary gluten in genetically predisposed individuals. It has a prevalence of 0.8-1.0% [1-3] and is a classical iceberg disease where in clinically diagnosed cases represent only 10-12% of the total number of cases in the community [4,5].

Celiac disease classically presents early between 6 months to 3 years of age with diarrhea, abdominal distension and failure to thrive. However, a significant proportion of cases do not have classical manifestations but may present with a myriad of clinical manifestations such as anemia, short stature, recurrent abdominal pain (RAP) and delayed puberty. With increasing awareness and availability of serological tests, more and more cases of atypical rather than typical or classical celiac disease are now being diagnosed clinically.

Among the atypical manifestations, anemia, especially iron deficiency anemia, is a particularly common manifestation in children as well as in adults. Kochhar, *et al.* [6] reported that out of 434 children diagnosed with celiac disease at a gastroenterology clinic, 84% had anemia at presentation and 39% had anemia as a presenting feature. Similarly a study by Carroccio, *et al.* [7] reported that out of 130 Italian children diagnosed with celiac disease, 70% had iron deficiency anemia. More importantly, 1.5% of these children had anemia as the sole presenting symptom. Similar findings were quoted by a Turkish study where Kuloglu, *et al.* [8] reported that 81.6% of children with celiac disease ( $n=109$ ) had iron deficiency anemia at presentation and 14.6% had repeated iron deficiency.

Iron deficiency is a significant public health problem in India and is a widespread micronutrient deficiency among Indian children. Data from the third National Family Health Survey (NFHS-3) of India [9] showed alarmingly high prevalence of anemia – 60% and 70% among preschool children and adolescents, respectively. Poor iron reserves at birth, inadequate dietary iron intake, inappropriate timing

and type of complimentary feeds in infants, frequent infections and defective iron absorption from a diseased gut are some of the causes of iron deficiency anemia in India. Celiac disease is an important cause of poor iron absorption because of associated villous atrophy. Wide prevalence of iron deficiency anemia and increasing prevalence of celiac disease in our country raises a pertinent question: could some of these cases of iron deficiency in the community be due to undiagnosed celiac disease representing the silent iceberg of celiac disease?

Several studies have looked into prevalence of celiac disease in iron deficiency anemia. In a Turkish study on 135 children with anemia and 223 healthy children, the authors reported that 4.4% of anemic children had celiac disease [10]. Abd El Dayem, *et al.* [11] studied 25 children with refractory iron deficiency anemia of which 44% had celiac disease. Bansal, *et al.* [12] reported 83 Indian children with difficult to treat anemia from a hematology clinic who were subsequently found to have celiac disease. However, most of these studies have been carried out in a specialized hematology clinic focusing on difficult to treat or refractory anemia. Only one of the above studies had a control arm. Some of these studies, especially those from Turkey and Egypt, do not address the issue of geographical and ethnic variation, and may not be applicable to countries with high prevalence of celiac disease such as India.

The study by Narang, *et al.* [13] in this issue has addressed some of these issues while trying to answer the question regarding the prevalence of celiac disease among children with iron deficiency anemia. They found that 3.9% children with moderate-to-severe anemia had biopsy proven celiac disease compared to none among equal numbers of controls. It would be interesting to know whether these anemic children (who were found to be having celiac disease) were also having any other features (like short stature, RAP, constipation, diarrhea etc.) suggestive of celiac disease, as in our experience [14], children having two or more of these clinical features had much higher chances of celiac disease; 8.4% with two

features and 24.2% with  $\geq 3$  clinical features compared to 0% with only one feature. Nevertheless, if this finding of even 3.9% prevalence of celiac disease among moderate-to-severe iron deficiency anemic individuals can be confirmed by larger community-based multicentric studies, it will go a long way in at least partially addressing the large public health problem of iron deficiency anemia in India.

*Funding:* None; *Competing interests:* None stated.

#### REFERENCES

1. Bingley PJ, Williams AJ, Norcross AJ, Unsworth DJ, Lock RJ, Ness AR, *et al.* Avon Longitudinal Study of Parents and Children Study Team. Undiagnosed celiac disease at age seven: population based prospective birth cohort study. *BMJ*. 2004;328:322-3.
2. Catassi C, Rätsch IM, Fabiani E, Ricci S, Bordicchia F, Pierdomenico R, *et al.* High prevalence of undiagnosed celiac disease in 5280 Italian students screened by antigliadin antibodies. *Acta Paediatr*. 1995;84:672-6.
3. Maki M, Mustalahti K, Kokkonen J, Kulmala P, Haapalahti M, Karttunen T, *et al.* Prevalence of celiac disease among children in Finland. *N Engl J Med*. 2003;348:2517-24.
4. Ravikumara M, Nootigattu VK, Sandhu BK. Ninety percent of celiac disease is being missed. *J Pediatr Gastroenterol Nutr*. 2007;45:497-9.
5. Whyte LA, Jenkins HR. The epidemiology of coeliac disease in South Wales: A 28-year perspective. *Arch Dis Child*. 2013;98:405-7.
6. Kochhar R, Jain K, Thapa BR, Rawal P, Khaliq A, Kochhar R, *et al.* Clinical presentation of celiac disease among pediatric compared to adolescent and adult patients. *Indian J Gastroenterol*. 2012;31:116-20.
7. Carroccio A, Iannitto E, Cavataio F, Montalto G, Tumminello M, Campagna P, *et al.* Sideropenic anemia and celiac disease: one study, two points of view. *Dig Dis Sci*. 1998;43:673-8.
8. Kuloğlu Z, Kirsacıoğlu CT, Kansu A, Ensari A, Girgin N. Celiac disease: presentation of 109 children. *Yonsei Med J*. 2009;50:617-23.
9. National Family Health Survey-4, 2015-16: India Fact Sheet. Ministry of Health and Family Welfare. Available from: <http://rchiips.org/NFHS/pdf/NFHS4/India.pdf>. Accessed December 5, 2017.
10. Kalayci AG, Kanber Y, Birinci A, Yildiz L, Albayrak D. The prevalence of celiac disease as detected by screening children with iron deficiency anaemia. *Acta Paediatr*. 2005;94:678-81.
11. Abd El Dayem SM, Ahmed Aly A, Abd El Gafar E, Kamel H. Screening for celiac disease among Egyptian children. *Arch Med Sci*. 2010;6:226-35.
12. Bansal D, Trehan A, Gupta MK, Varma N, Marwaha RK. Serodiagnosis of celiac disease in children referred for evaluation of anemia: A pediatric hematology unit's experience. *Indian J Pathol Microbiol*. 2011;54:756-60.
13. Narang M, Natarajan R, Shah D, Puri AS, Manchanda V, Kotru M. Celiac disease in children with moderate-to-severe iron-deficiency anemia. *Indian Pediatr*. 2018; 55:31-4.
14. Singh A. Screening for Celiac Disease with Clinical Risk Factors. Thesis submitted for DNB Pediatrics to the National Board of Examination, 2017.