



THE ASSOCIATION OF VITAMIN D DEFICIENCY AND ANEMIA WITH CELIAC DISEASE IN A YOUNG CHILD: A CASE STUDY

Ahmed I. Insaf¹ and Ali S. Dawood*²

¹Department of Pediatrics, College of Medicine, Wasit University, Wasit, Iraq.

²Department of Pathology and Forensic Medicine, College of Medicine, Wasit University, Wasit, Iraq.

***Corresponding Author: Ali S. Dawood**

Department of Pathology and Forensic Medicine, College of Medicine, Wasit University, Wasit, Iraq.

Article Received on 12/02/2017

Article Revised on 05/03/2017

Article Accepted on 26/03/2017

ABSTRACT

Celiac disease (CD) is an autoimmune disease triggered by the ingestion of foods containing gluten (gliadin), which is associated with vitamin D deficiency and with a number of hematological disorders. Individuals can present with vitamin D deficiency and hematological abnormalities even prior to the diagnosis of celiac disease. We report a typical case of a 13 years old male presented with recurrent attacks of diarrhea, constipation since the age of two years, loss of appetite, fatigue, loss of interest, history of two fracture in the last two years from simple trauma, the patient not responding to the treatment, Further laboratory tests were performed, the complete blood picture showed that the patient suffering from hypochromic microcytic anemia, Hb 8 g/dL, vitamin D3 level was 3.5 ng/ml, anti gliadin IgA test was negative, anti gliadin IgG test was positive (1.9), anti tissue transglutaminase IgA was positive (6.6) and anti tissue transglutaminase IgG was positive (8.1). Our conclusion suggested that, the vitamin D deficiency and anemia in CD are common during the childhood, therefore the screening of further laboratory investigations are needed.

KEYWORDS: Celiac disease, Vitamin D deficiency, Anemia.

INTRODUCTION

Celiac disease is an autoimmune disease characterized by intolerance to gluten, a protein found in wheat, rye and barley, in genetically susceptible individuals. Subsequent immune-mediated enterocyte destruction with atrophic intestinal epithelium results in a decreased surface area for absorption. Celiac disease is usually diagnosed in childhood. The prevalence of celiac disease, both symptomatic and subclinical, is higher than previously thought, and the importance of this diagnosis is becoming increasingly appreciated. It is estimated that 5% of North Americans and western Europeans suffer from celiac disease^[1, 2]. The osteoporosis common bone disease generally, although some studies a proved evidence for osteomalacia on bone biopsies in a small percentage of patients. The low 25(OH)D, elevated parathyroid hormones, and normal to increased 1,25(OH)2D3 are generally found in untreated patients as would be expected with malabsorption of calcium and vitamin D from the atrophic small intestinal epithelium^[3]. Otherwise, one of the most frequent finding in patients with CD is anemia^[4, 5]. Anemia was particularly common in patients with untreated CD in the past but is still frequently encountered in undiagnosed adults^[6, 7]. The anemia is mostly hypoproliferative, refer to disability in absorption of essential nutrients like iron

and various vitamins. The prevalence of anemia varies greatly according to different reports and has been found in 12% to 69% of newly diagnosed patients with CD^[5-9].

CASE REPORT

13 years old male, seen in the pediatric clinic, presented with recurrent attacks of diarrhea, constipation since the age of two years, loss of appetite, fatigue, loss of interest, history of two fracture in the last two years from simple trauma, and don't responding to the treatment for long time. On examination he was ill looking, pale, the weight is below the third centile for his age, the height is on the 25 centile for his age. Further laboratory tests were performed, the complete blood picture showed that the patient suffering from hypochromic microcytic anemia, Hb 8 g/dL, white blood cells was normal and platelets counts was normal, vitamin D3 level was 3.5 ng/ml, anti gliadin IgA test was negative, anti gliadin IgG test was positive (1.9), anti tissue transglutaminase IgA was positive (6.6) and anti tissue transglutaminase IgG was positive (8.1). Regarding to the treatment was gluten free diet, folic acid 2.5 mg\ day for 1 month, vitamin D 3000 IU oral dose was taken at his visit to the clinic and iron supplement 4 mg \ kg for three months. After 1 month the patient is reevaluated with very good response to

treatment with no bone pain improved appetite and activity with normal hemoglobin.

DISCUSSION

Celiac disease (CD), also known as gluten-sensitive enteropathy, is a systemic disorder with protean manifestations. Genetically predisposed individuals who carry the HLA-DQ2 or DQ-8 alleles^[10]. It is a common disease, previously well-known occur in mainly in children but is now increasingly being diagnosed in all ages^[11]. Various gastrointestinal diseases lead to bone loss by one or more of the following processes: malabsorption of vitamin D and minerals (calcium and phosphate in particular), production of inflammatory cytokines, and the use of drugs such as glucocorticoids to treat the inflammatory process. Although maintenance of adequate vitamin D and calcium nutrition is important for all diseases involving the gastrointestinal system^[3]. In a recent study of 89 premenopausal women being evaluated for osteoporosis, 19% were positive for IgA antibodies to gliadin, and one half of these were also positive for IgA endomysial antibodies^[12]. Mustafa ÜNÜBOL *et al*, 2012 found the strong association between vitamin D deficiency and CD through a case report, A 26-year-old female admitted with the complaints of cramps in her hands and feet, and weight loss in the puerperium. Vitamin D deficiency was found with concomitant hypocalcemia and low bone mineral density. The patient was diagnosed with CD in the puerperium by means of biopsy and antibody testing^[13]. Recent study by Anna Tavakkoli *et al*, 2013, found that, no association between vitamin D levels and autoimmune disorders in patients with CD^[14]. On the other hand, CD is a common cause of various hematologic disorders, the most common of which is anemia. The anemia of CD is usually due to malabsorption of micronutrients such as iron, folic acid, and vitamin B12. CD is also frequently implicated in the etiology of other blood-count abnormalities, splenic hypofunction, and intestinal lymphomas^[15]. The prevalence of anemia varies greatly according to different reports in newly diagnosed patients with CD^[5-9]. The pathophysiology of anemia is likely multifactorial, one widely accepted mechanism is that iron is absorbed by the proximal duodenum, a region of primary involvement in CD and site of fat soluble vitamin absorption^[16]. Jason W. Harper *et al*, 2007, noticed that although anemia is still a common presentation of celiac disease, nutritional deficiencies alone do not explain this phenomenon in all cases; inflammation appears to contribute as evidenced by the presence of anemia of chronic disease in some individuals^[17]. Other studies estimated the incidence of vitamin B12 deficiency at the time of diagnosis of celiac disease and showed the rate between 8 and 41%^[18, 19]. In conclusion, through study our case we conclude that the vitamin D deficiency association with celiac disease, also through our finding we and other researches, we expect that the anemia most frequent finding in patients with CD.

CONFLICT OF INTEREST

- 1- Both authors have declared no conflict of interest.
- 2- Patient's family consent form has been procured prior to the case report study.

REFERENCES

1. Koning F. Celiac disease: caught between a rock and a hard place. *Gastroenterology*, 2005; 129(4): 1294-1301.
2. Fasano A, Berti I, Gerarduzzi T, Not T, Colletti RB, Drago S, Elitsur Y, Green PH, Guandalini S, Hill ID *et al*. Prevalence of celiac disease in at-risk and not-at-risk groups in the United States: a large multicenter study. *Arch Intern Med*, 2003; 163(3): 286-292.
3. Bikle DD: Vitamin D insufficiency/deficiency in gastrointestinal disorders. *J Bone Miner Res* 2007, 22 Suppl 2: V50-54.
4. Hoffbrand AV. Anaemia in adult coeliac disease. *Clin Gastroenterol*, 1974; 3(1): 71-89.
5. Unsworth DJ, Lock FJ, Harvey RF. Iron-deficiency anaemia in premenopausal women. *Lancet*, 1999; 353(9158): 1100.
6. Bottaro G, Cataldo F, Rotolo N, Spina M, Corazza GR. The clinical pattern of subclinical/silent celiac disease: an analysis on 1026 consecutive cases. *Am J Gastroenterol*, 1999; 94(3): 691-696.
7. Kolho KL, Farkkila MA, Savilahti E. Undiagnosed coeliac disease is common in Finnish adults. *Scand J Gastroenterol*, 1998; 33(12): 1280-1283.
8. Hin H, Bird G, Fisher P, Mahy N, Jewell D. Coeliac disease in primary care: case finding study. *BMJ*, 1999; 318(7177): 164-167.
9. Lo W, Sano K, Lebwohl B, Diamond B, Green PH. Changing presentation of adult celiac disease. *Dig Dis Sci*, 2003; 48(2): 395-398.
10. Green PH, Cellier C. Celiac disease. *N Engl J Med*, 2007; 357(17): 1731-1743.
11. Green PH, Jabri B. Coeliac disease. *Lancet*, 2003; 362(9381):383-391.
12. Armagan O, Uz T, Tascioglu F, Colak O, Oner C, Akgun Y. Serological screening for celiac disease in premenopausal women with idiopathic osteoporosis. *Clin Rheumatol*, 2005; 24(3): 239-243.
13. Mustafa ÜNÜBOL, Engin GÜNEY, Volkan YAZAK, Umut ÇAKIROĞLU, Adil COŞKUN, İbrahim METEOĞLU. Celiac Disease Presenting with Vitamin D Deficiency and Low Bone Mineral Density in the Puerperium. *Turk J Rheumatol*, 2012; 27(2): 136-139.
14. Tavakkoli A, DiGiacomo D, Green PH, Lebwohl B. Vitamin D status and concomitant autoimmunity in celiac disease. *J Clin Gastroenterol*, 2013; 47(6): 515-519.
15. Brousse N, Meijer JW. Malignant complications of coeliac disease. *Best Pract Res Clin Gastroenterol*, 2005; 19(3): 401-412.
16. Hernandez L, Green PH. Extraintestinal manifestations of celiac disease. *Curr Gastroenterol Rep*, 2006; 8(5): 383-389.

17. Harper JW, Holleran SF, Ramakrishnan R, Bhagat G, Green PH. Anemia in celiac disease is multifactorial in etiology. *Am J Hematol*, 2007; 82(11): 996-1000.
18. Dahele A, Ghosh S. Vitamin B12 deficiency in untreated celiac disease. *Am J Gastroenterol*, 2001; 96(3):745-750.
19. Dickey W. Low serum vitamin B12 is common in coeliac disease and is not due to autoimmune gastritis. *Eur J Gastroenterol Hepatol*, 2002; 14(4): 425-427.