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Early Celiac Disease in a Soldier Presenting With Marked Weight Loss

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Abstract:
Introduction*: Celiac disease is an immune mediated enteropathy of small intestine triggered by gluten containing diet in genetically susceptible individuals. Early diagnosis in strongly suspected patients presenting with gastrointestinal symptoms, weight loss and malabsorption can be done with the help of serological tests followed by duodenal biopsy from the lower duodenum as gold standard for the definitive diagnosis. Gluten free diet will lead to rapid improvement in clinical symptoms and in nutritional and hematological parameters. These subjects need prolonged follow up to assess adherence to gluten free diet and assess long term consequences of celiac disease.*
Case Report: *47 years old soldier presented with marked weight loss with chronic diarrhea and malabsorption.Serological tests for celiac disease based on strong clinical suspicion was carried out and immunoglobin A for endomysial antibody was found positive in low titres.On histopathological examination of duodenal biopsy specimens features of early celiac disease was found. Hematological investigations revealed pancytopenia.With gluten free diet individual improved symptomatically in three months with weight gain and normal bowel movement along with improvement in the hematological parameters.*
Conclusion*: Celiac disease need to be kept in differential diagnosis of patients presenting with weight loss,chronic diarrhea and malabsorption.Early diagnosis of celiac disease with serology and duodenal biopsy histopathological examination will benefit the patient by recommending gluten free diet to improve the quality of life and prevent long term consequences of the disease.*
Keywords *- Celiac disease, duodenal biopsy, gluten diet, weight loss*

I. Introduction

Celiac disease is an immune mediated enteropathy triggered by dietary gluten in genetically susceptible persons. In this gastrointestinal disorder inflammation leading to injury of the mucosal lining of the small intestine occurs due to gliadin,a protein found in the gluten containing foods like wheat, rye and barley.[1]

Celiac disease affects 0.6% to 1.0% of the population worldwide[2,3] and in India it is observed mainly in the northwestern parts of country where wheat is the staple food.[4] The prevalence of celiac disease is higher in women than men and also is increased in persons with first degree affected relative,type1 diabetes mellitus,Hashimoto thyroiditis or other autoimmune diseases(including IgA nephropathy,Sjogrens disease and autoimmune liver diseases),Down syndrome,Turner syndrome and IgA deficiency.[5-10]

Antigen presenting cells with expression of DR2 and DQ8 halo types triggers abnormal immune response on binding with activated (deaminated) gluten peptides and thus these two halo types are necessary but not sufficient for development of celiac disease.[11]

Patients mostly present with gastrointestinal symptoms including abdominal distension, chronic diarrhea,anorexia,steatorrhea and weight loss.[12] The disease can also present with extra intestinal manifestations like osteoporosis[13],cutaneous manifestation most commonly with dermatitis herpetiformis[12] and associated increased risk of esophageal cancer,melanoma,non-Hodgkin lymphoma and small intestine adenocarcinoma.[14]

The best approach to diagnose celiac disease is to have a systematic process of case identification of patients with signs, symptoms or associated co morbidities with celiac disease[1] and thereafter test serologically in a multistep cost effective manner. At first step immunoglobin A tissue transglutaminase(IgA-tTG) and total serum IgA need to be measured as celiac disease also has high prevelance of IgA deficiency.[15]Celiac disease is unlikely if these two tests are negative but if clinical suspicion is high we can measure IgA endomysial antibody(IgA-EMA) in next step. If IgA-Ttg or IgA-EMA is positive definitive diagnosis with duodenal biopsy is planned. If IgA-tTG test is negative but total serum IgA level is low immunoglobin G(IgG) is measured which if negative infers that celiac disease is unlikely.Positive IgG levels will lead to plan duodenal biopsy for definite diagnosis.IgA Anti Gliadin antibodies(IgA-AGA) are added to diagnostic protocol for children under 2 years of age.[16] All these serological tests need to be done before eliminating gluten from the diet and if gluten free diet(GFD) is started serological testing is used to monitor adherence and response to diet.[16]Testing for genetic markers HLA DQ2 and HLADQ8 helps in identifying individual at risk of developing celiac disease.[17]

Tissue biopsy is the gold standard for the diagnosis of celiac disease which is obtained from second and third part of the duodenum [16] and is based on the integrated assessment of elementary lesions like increased intraepithelial T lymphocytes, crypt hyperplasia, villous atrophy and decreased enterocyte height.[18]

Treatment of celiac disease involves complete gluten free diet(i.e. a diet with no wheat, rye or barley protein) but a minimal degree of gluten contamination is difficult to avoid.10-50 mg per day is the lowest amount of daily gluten that can damage celiac intestinal mucosa.[3,19] With 6 to 24 months of start of gluten free diet clinical, serological and histological remission occurs in the celiac disease but patients need to be followed up for life to review adherence to diet and monitoring of associated conditions.(eg.osteoporosis and autoimmune diseases).

II. Case Report

47 years old Indian soldier resident of Rajasthan and deployed at northeastern India presented to our hospital with marked unintentional weight loss of 20 kg in six months duration associated with increased bowel movement of same duration. He also complained of peri-umbilical colicky pain associated with passage of four to five times large volume stool per day. His appetite was normal despite weight loss and there were no constitutional symptoms or fever and chronic cough. There were no history suggestive of hyperthyroid disorder or any other systemic illness related to his presenting complaints. He did not have any addictions or high risk sexual behavior.

On examination he was cachectic and emaciated with body-weight of 45 kg(height 171 cm).There were bilateral temporal and intercostals spaces hollowing with angular cheilitis present.His vitals parameters were within normal limits and other examination(general+ systemic) were unremarkable.

Investigations were carried out to ascertain the cause of gastrointestinal symptoms with weight loss and malabsorption.Electrolytes(Na/K/Ca) were normal. Stool routine examination did not reveal any ova, cyst or parasites.HBsAg,Anti HCV Antibody,HIV1 &2 Antibody were negative.USG(abdomen),CXR(PA),CECT(thorax) were normal.Colonoscopy(till terminal ileum) were unremarkable.UGIE revealed normal stomach and duodenum with biopsy taken fromD3 segment.Thyroid profileand lipid profile were normal.Vit B12 levels were normal.His blood sugars both fasting and post prandial were within normal limits.IgA Tissue transglutaminase(IgA-Ttg) levels were negative.Total serum IgA levels were normal and IgA endomysial antibody(IgA-EMA) was positive in low titres(1:40).D3(Biopsy) HPE showed a few foci displaying blunting of villi.Lamina propria showed mild to moderate lymphoplasmacytic cell infiltration and mild intraepithelial lymphocytic infiltration.Overall features were suggestive of Celiac disease. His hematological parameters showed pancytopenia as shown in Table.1 with other biochemical investigations(including RFT and LFT) were essentially normal.

The individual was started on gluten free diet along with Vitamin B complex,folic acid and mineral supplementation.After three months follow up he gained 15 kg weight with symptomatic improvement in bowel movement and normalization of the hematological parameters.(Table.1).Repeat D3 Biopsy revealed remission of foci of villous atrophy but presence of mild to moderate lymphocytoplasmic cells in lamina propria.

Presently he is being followed up for adherence to gluten free diet and assess any long term consequences of the disease.

Table.1: Results Of Labaratory Tests

VARIABLE	NORMAL VALUE	FIRST ADMISSION	THREE MONTHS FOLLOWUP
Hemoglobin(g/dl)	13.5-17.5	10.8	12.8
White cell count(permm3)	4500-11000	2200	7600
Platelet count(/mm3)	150000-450000	38000	237000
MCV(fl)	77-97	105.7	81.3
MCH(pg/dl)	26-32	26	25
Serum albumin	3.5-5.5	3.1	3.2
PTT(seconds)	11-13	13	12
PT(seconds)	26-38	30	32
AST(U/L)	5-40	32	30
ALT(U/L)	5-40	40	32
ALP(U/L)	64-306	203	200

III. Discussion

Celiac disease is a systemic immune mediated disorder of small intestine in genetically susceptible individual. The frequency of celiac disease is increasing in developing countries due to adoption of western food habits, changes in wheat production and preparation, increased awareness of the disease or combination of these factors. In India celiac disease mainly observed in the northwestern part of the country due to wheat being the

staple food.[4] Celiac disease is strongly suspected when individual has malabsorption syndrome with repeated diarrhea like bowel movements, abdominal pain and marked weight loss.

In our case also individual is a 47 years old Indian soldier of Rajasthan who presented with marked unintentional weight loss of 20 kg in six months along with chronic diarrhea and clinical features of malabsorption.

Celiac disease is associated with diseases like type1 diabetes mellitus,Hashimoto thyroiditis,autoimmune liver diseases,Sjogren disease,IgA nephropathy,Down syndrome,Turner syndrome and IgA deficiency.[5-10]

These associated disease condition was ruled out in our case through clinical and laboratory assessment.

After clinical suspicion and pre test probability of celiac disease,serological tests are recommended.IgA –tTG test have the sensitivity of 98% and specificity of 90% for celiac disease(s2).IgA-EMA has sensitivity of 90% and low titre positivity(1:5) are often present in the infiltrative lesion of intestinal mucosa(type 1) according to Marsh classification[18] suggestive of celiac disease.It is performed if IgA-Ttg and total serum levels of IgA are not suggestive of celiac disease. Definitive diagnosis of celiac disease is made by duodenal biopsy and histopathological picture.

In our case also since celiac disease was strongly suspected based on the presenting symptoms and signs,serology screening was carried out with initial IgA-tTG being negative and no deficiency of IgA in serum found.Thereafter IgA-EMA was found to be positive in low titre and for definitive diagnosis biopsy was taken from second and third part of duodenum.Histopathological examination of biopsy specimen found that there were few foci displaying blunting of villi.Lamina propria showed mild to moderate lymphoplasmocytic cell infiltration and mild intra epithelial lymphocytic infiltration. Overall the features were suggestive of celiac disease.

Since we had foci of blunting of villi celiac disease was considered because normal villi with pathologic increase in intraepithelial T lymphocytes are found also commonly in gluten sensitivity,infections(viral enteritis,Giardiasis,Cryptosporidiasis,Helicobacter pylori),drugs(NSAIDs) and immune dysregulation.[18]

In celiac disease there can be iron,folic acid and/or vit B12 deficiencies which can result in anemia,decrease in both leucocytes and platelet count and even manifest as severe pancytopenia.[20] With supplementation of iron,folic acid and vitB12 these hematological manifestation respond along with gluten free diet.[21] In our case also the individual had pancytopenia which responded to supplementation of iron,folate and vitB12 along with gluten free diet.

Gluten free diet is the only treatment for patient with celiac disease and wheat,rye,barley are to be avoided in the diet.In our case gluten free diet was advised and at three months follow up the patient had gained 15 kg of weight with his hemoglobin,plateletcount and white blood cell count increased (Table.1).Repeat duodenal biopsy had shown well maintained villous structure(compared to earlier biopsy HPE showing foci of villous blunting) with mild to moderate lymphocytoplasmic cells in the lamina propria.

IV. Conclusion

Celiac disease need to be kept in differential diagnosis of patients presenting with weight loss,chronic diarrhea and malabsorption.Early celiac disease diagnosis with serology and duodenal biopsy histopathological examination will benefit the patient by recommending gluten free diet to improve the quality of life and prevent long term consequences of the disease.

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