Relationship between Chronic Hepatitis B Virus and Pathogenicity of Celiac Disease in the Iraqi Patients

Shiamaa G. Abid¹, Rana S. Aboud¹*, Hula Y. Fadil¹, Anmar Saadi Aboud²

¹Biology department, College of Science, University of Baghdad. Baghdad-Al-Jadiria, Iraq
²Biology department, College of Science, University of Al-mustansaria, Baghdad, Iraq

*Corresponding Author: Rana S. Aboud, Biology department, College of Science, University of Baghdad. Baghdad-Al-Jadiria, Iraq

Received: 14 January 2016 Revised: 30 January 2016 Accepted: 02 February 2016

ABSTRACT

To determine the relationship between chronic hepatitis B virus and autoimmune celiac disease, seventy five patients with chronic hepatitis B virus of ages (8-70) years have been investigated and compared with 50 healthy individuals. All the studied groups were carried out to measure anti-Gliadin antibodies IgA and IgG by ELISA test and anti-reticulin antibodies IgA and IgG by IFAT. There were significant elevation (P<0.05) in the concentration of AGA IgA and IgG antibodies compared to control group. The prevalence of AGA antibodies IgA and IgG was 8% and 9.33% respectively. There were a highly significant differences (P<0.01) between studies groups. The prevalence of anti-reticulin antibodies ARA IgA and IgG was 6.67% and 4.0% respectively in sera of CHB patients, and there were a highly significant differences (P<0.01) between study groups. These results indicated that infection with chronic hepatitis B virus play an important role in pathogenesis of celiac disease.

Keyword: Hepatitis B virus; Celiac disease; Anti-gliadin; Anti-reticulin Antibodies

INTRODUCTION

Celiac disease is defined as a permanent intolerance to ingested gluten, the structural protein in wheat rye and barley [1]. Celiac disease is recognized as a chronic autoimmune disorder that occurs in genetically predisposed individuals, both children and adults and it affects approximately 1% of the world population [2]. Environmental, immunologic, and genetic factors are all important contributors to the pathogenesis of CD. Infectious agents have been implicated in the pathogenesis of CD via various pathogenic mechanisms, such as molecular mimicry, resulting in modulation of the host’s immune tolerance [3]. Transient infections or increased permeability of the mucosa may facilitate disease onset induced by the uptake of gluten peptides into a
micro environmental milieu in the small intestinal mucosa [4]. Some hepatotropic viruses (HBV and HCV) are capable of triggering autoimmune phenomena in the course of the disease [5]. The link between HBV infection and celiac disease seems to be controversial, relatively little data exist on the relationship between HBV and CD, although one third of the world’s population (around 2 billion people) have been infected with HBV, it has been reported that the response rate of HBV vaccination in CD-infected individuals is lower (30%-50%) than in the general population 4%-10% [6]. Recently, it has been hypothesized that non intestinal inflammatory diseases may trigger immunologic gluten intolerance in susceptible individuals, and HBV as far as hepatitis C virus (HCV) were thought to be suitable candidates and segregates a higher percentage of CD patients [7,8].

Hepatitis B virus infection leads to the activation of several immune system components that has been suggested to culminate in the production mild to moderate hyper transaminasemia (up to five times the upper and release of interferon and interleukins that disrupt the intestinal mucosal barrier, allowing the penetration of immunogenic peptides and activation of CD4+ T lymphocytes. There appears to be an increase in the production of HLA-DQ8, which links gluten peptide molecules and facilitates activation of other immune cells. It is suggested that HBV can trigger the path physiological processes that lead to mucosal inflammation induced by gluten [4]. However, concrete data regarding the association of celiac disease and HBV are not available, although two billion people in the world have been infected by this virus [9]. One study has established the prevalence of CD in patients with chronic HBV. It had been hypothesized that chronic HBV could trigger immunological gluten intolerance in susceptible individuals [7,9], however, has not yet been supported by sufficient scientific evidence and data. Because the relationship between HBV and celiac disease has yet to be established, this study aimed to estimate the seroprevalence of some auto antibodies of CD in patients with chronic hepatitis B virus.

MATERIALS AND METHODS
The study was carried out on seventy five patients infected with chronic hepatitis B virus who attended to hepatic and gastrointestinal tract hospital in capital of Baghdad during the Period from first of November 2013 until February 2014. The ages of the total patients were ranged from (8-70) years. Fifty samples of healthy individuals; 23 female and 27 male were studied as a control groups of same ages and sex. Consent of was obtained regarding the data collection & examination of blood samples from the patients. Blood samples (5 ml) were collected by disposable syringe into gel tubes and stand at room temperature until the coagulant was form. Then the samples are centrifuged at 3000 rpm for 5 minutes .Serum samples were dispended on a seven Ependroff tubes. All samples were marked by the name, day and numbering and stored at (-20˚C) until carried out to immunological examinations.

Immunological examination
All the studied groups were carried out to measure anti-gliadin antibodies IgA and IgG by ELISA test(Aeskulisa, Germany) and anti-reticulin antibodies IgA and IgG by IFAT test(Uroimmune, Germany) according to the leaflet of kit [10].

Statistical analysis
The statistical analysis system-SAS [11] was used to effect of different factors in study parameters. Chi-square test was used to significant comparison between percentage and least significant difference (LSD) test was used to significant compression between means in this study.
RESULTS AND DISCUSSION
The results of current study showed that there were significant elevation (P<0.05) in the concentration of AGA IgA antibody (6.83±0.28)U/ml compared to control group (3.03±0.16)U/ml, as well as the significant increase (P<0.05) in the concentration of AGA IgG antibody (6.53±0.33)U/ml compared to control group (2.04±0.18) U/ml as shown in fig. 1. Meanwhile, the prevalence of AGA antibodies IgA and IgG was (6/75) 8% and (7/75) 9.33%, respectively, hence, there were a highly significant differences (P<0.01) between studies groups as shown in fig. 2.

![Fig. 1: Mean level of AGA antibodies IgA and IgG (U/ml) among studied groups (CHB patients and control group).](image)

The prevalence of anti-reticulin antibodies (ARA) IgA and IgG was (6/75) 6.67% and (3/75) 4.0%, respectively in sera of CHB patients, and there were a highly significant differences (P<0.01) between study groups as illustrated in fig. 3. Furthermore, the Fig. 4 demonstrates the Positive ARA IgA and IgG antibodies by IIFT test on rat kidney tissue in the sera of CHB patients with a highly significant difference (P<0.01) to control group.

![Fig. 2: The distribution of positively cases with AGA antibodies IgA and IgG in sera of CHB patients](image)

The results of the current study was agreement with many comprehensive studies that identified the various percentages of AGA IgA antibody was 2-10% and AGA IgG antibody was 13.3-28% [8,12]. Antigliadin antibodies are directed to an environmental, dietetic factor-
gliadin, in contrast to all other CD markers, and could be therefore used as an early predictor of gluten ingestion [13]. Anti-gliadin antibodies are recommended as the cheaper strategy for higher risk population’s antibody was 13.3% [14].

Both IgA and IgG anti-gliadin antibodies (AGA) are detected in sera of patients with gluten sensitive enteropathy. IgG anti-gliadin antibodies are more sensitive but are less specific markers for the disease compared with IgA class antibodies. IgA anti-gliadin antibodies are less sensitive but are more specific. In clinical trials, the IgA antibodies have a specificity of 97% but the sensitivity is only 71% [15, 16].

Anti-reticulin antibody test is used for the identification of reticulin fiber in tissue sections, most commonly the liver, kidney and spleen. Anti-Reticulin Antibodies (ARA), IgA: Anti-ARA is not ordered as frequently because it is not as specific or sensitive as the other auto antibodies. It is found in about 60% of celiac disease patients and about 25% of patients with dermatitis herpetiformis. When used, ARA is ordered along with other celiac disease tests to help diagnose celiac disease [17, 18].

The prevalence of celiac auto antibodies in chronic hepatitis B patients was 9.1% in study was done by [19]. Several studies showed some interesting information about the high frequency of celiac disease auto antibodies in adults affected by CHB, one study indicates that...
at least celiac auto antibodies are much more frequent in patients with CHB comparison with the general population. Interestingly, some of the studies also showed that the frequency of celiac auto antibodies in CHB patients is much more than even autoimmune hepatitis (AIH) patients.

A variety possible mechanisms have been suggested the role of HBV infections in the development of autoimmune diseases. Molecular mimicry, based on amino acid similarities shared by viral and self-antigens, has long been proposed as a pathogenic mechanism. Iglesias et al.,[4] gave away that two patients who developed CD after resolution of an acute HBV infection. A diagnosis of CD was confirmed by positive serological tests and the presence of the typical histopathologic pattern. These authors suggested that the development of immune response for HBV clearance triggers the intestinal tissue damage observed in CD in genetically predisposed Individuals [4]. Similarly, hepatitis B and hepatitis C, which may have amino acid sequences homologous to the toxic epitopes in gliadin, could trigger immunological gluten intolerance in susceptible subject [20]. Hepatitis B virus was found to share amino acid sequences with different auto antigens. Tissue damage and the release of intracellular components is just another example of the autoantibody production caused by this virus [21].

CONCLUSION
Our conclusion indicated that infection with chronic hepatitis B virus play an important role in pathogenesis of celiac disease.

CONFLICT OF INTEREST STATEMENT
The authors declare that they have no competing interests.

REFERENCES


Cite this article as: