

Cd Coexist With Autoimmune Thyroid Diseases

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Abstract: (CD) is a chronic inflammatory disorder of the upper small intestine caused by an inflammatory T-cell response to the ingestion or storage proteins in wheat (gliadin), rye (secalin), and barley (hordein), which are collectively called “gluten”, and possibly oat products. (ATD) is the most common autoimmune condition, an acting approximately 2% of the female population and 0.2% of the male population. Thyroiditis has been repeatedly associated with celiac disease. (TTG-A) has proved to be a very specific indicator to identify patients with CD. (anti-TPO), (anti-TG) and (anti-TSHR) is a main feature of autoimmune thyroid disease.

Methods; One hundred and sixteen submitted in this study 86 patient for CD and 30 control (healthy), tested for (TTG-IgG, TTG-IgA, Anti-TSH Anti-TPO and Anti-TG) by use ELISA method.

Results; (TTG-IgG) with (TTG-IgA, Anti-TSH) show statistical significant, (TTG-IgG) with (Anti-TPO, Anti-TG) show statistical non-significant. (TTG-IgA) with (TTG-IgG, Anti-TSH) show statistical significant. (TTG-IgA) with (Anti-TPO, Anti-TG) show statistical non-significant.

Conclusion; There are a strong association between CD and autoimmune thyroid disorders

Key words: Thyroid disorder (CD), (TTG-A) Anti-TSH, Autoimmune thyroid disease (ATD), Anti-TPO, Anti-TG.

INTRODUCTION

Celiac disease (CD) is an chronic inflammatory disorder of the upper small intestine caused by an inflammatory T-cell response to the ingestion or storage proteins in wheat (gliadin), rye (secalin), and barley (hordein), which are collectively called “gluten”, and possibly oat products. (Wieser, *et al.* 2008) (Mearin, *et al.* 2007). Celiac disease affects approximately 1% of the population. (Dhalwani, *et al.* 2014) CD has been found at an increased rate in patients with autoimmune thyroid disease. (Lauret, *et al.* 2013). Prevalence of CD was noted to be 2% to 5% in autoimmune thyroid disorders (AITD). (Ch'ng, *et al.* 2007).

Autoimmune thyroid disease (ATD) is the most common autoimmune condition, acting approximately 2% of the female population and 0.2% of the male population (Cappa, *et al.* 2013). AITD is subdivided into two main groups, Graves' disease (GD) and Hashimoto's thyroiditis (HT). have a significantly increased risk of developing other autoimmune diseases. (Glick, *et al.* 2013). Thyroiditis has been repeatedly associated with celiac disease (Fasano, Alessio. 2006).

The etiology of celiac disease is not clearly known. Many factors, such as environmental, genetic, and immunologic factors, are involved in the pathology of celiac disease. (Krupa-Kozak, Urszula. 2014)

The etiology of the AITD is still unknown, but a genetic effect is likely. The infection hypothesis is based on the theory of molecular mimicry. (Dittmar, *et al.* 2011).

There is a strong association between some diseases and HLA (human leukocyte antigen) HLA typing is becoming a tool to screen susceptibility to certain autoimmune diseases, as a AITD, and celiac disease. (Mahdi. 2013). In CD and AITD both HLA DQ2 and DQ8 and the gene coding for cytotoxic T-lymphocyte-associated antigen-4 (CTLA-4) are over-expressed. (Stazi, *et al.* 2010).

The coexistence of CD and autoimmune thyroid disease has been explained by several mechanisms such as common genetic predisposition and the association of both diseases with the gene encoding cytotoxic T-lymphocyte-associated antigen-4, a gene conferring susceptibility to thyroid autoimmunity.(Lauret, *et al* 2013).

Among different serological tests for screening of CD, such as anti-gliadin antibodies (AGA) and endomysial IgA antibody (EMA), tissue transglutaminase antibodies (TTG-IgA, IgG) , The tissue transglutaminase antibodies (TTG-A) has proved to be a very specific indicator to identify patients with CD . (Medhat, *et al.* 2011). TTG antibody assay is actually identified as the best test to screen patients with suspected CD.. (Alessio, *et al* 2012).

The development of anti-thyroid peroxidase (anti-TPO) antibodies, anti-thyroglobulin (anti-TG) antibodies, and anti-TSH antibodies is a main feature of autoimmune thyroid disease . (Wan, *et al.* 2013).

METHODS

This study was carried out from 2018 until 2020. The total number was 116 subjects (48 men and 68 women). Patients group were 86 subjects and 30-control group.

Eighty six patient (86) (36 men and 50 women) pre-diagnosed with celiac disease aged between (2 -49) years .Thirty one apparently healthy subjects (12 men and 18 women) as control group aged between (3-51).

All subject enrolled in this study were tested for (TTG - IgA, TTG - IgG) and for thyroid marker (anti TPO, anti TG and anti TSHR antibodies) teste by ELISA

3 ml of blood was collected in gel tube (containing clot activator gel),then let to stand for 10 minutes to clot formation and centrifuged at 3500 rpm for 5 minutes , then fresh non hemolysis serum collected and kept in deep freeze (- 20 C°).

Statistical analysis

Collected data were fed into SPSS spreadsheet version 20. They were tabulated and examined for outliers and tested for normality. The latter approach was to enable selecting suitable parametric versus nonparametric statistical tests using Kolmogorov and Shapiro tests. Categorical variables were studied using chi squared tests and its subtypes while continuous variables used comparative t-tests and its subtypes. The level of significance was set to be 0.05.

RESULTS

In this study, 86 were diagnosed as patient with Celiac disease (CD), correlation of (TTG-IgG) with (TTG-IgA, Anti-TSH) show statistical significant. *P*. value > 0.05, (TTG-IgG) with (Anti-TPO, Anti-TG) show statistical non-significant. *P*. value < 0.05.

Correlation of (TTG-IgA) with (TTG-IgG, Anti-TSH) show statistical significant. *P*. value > 0.05, (TTG-IgA) with (Anti-TPO, Anti-TG) show statistical non-significant. *P*. value < 0.05. In addition, 30 were control, correlation of (TTG-IgG) with (TTG-IgA, Anti-TSH) show statistical non-significant. *P*. value < 0.05, (TTG-IgG) with (Anti-TPO, Anti-TG) show statistical non-significant. *P*. value < 0.05.

Correlation of (TTG-IgA) with (TTG-IgG, Anti-TSH) show statistical no-significant. *P*. value < 0.05, (TTG-IgA) with (Anti-TPO, Anti-TG) show statistical non-significant. *P*. value < 0.05.

Table 1: Correlation (r) of the CD markers with the AITD biomarkers

Group	Biomarkers	TTG-IgG	TTG-IgA	p-value	
		r	r	TTG-IgG	TTG-IgA
Control	TTG-IgG	/	-0.148	/	0.435
	TTG-IgA	-0.148	/	0.435	/
	Anti-TPO	-0.162	-0.122	0.393	0.522
	Anti-TSH	-0.068	-0.211	0.720	0.263
	Anti-TG	0.063	0.190	0.740	0.315

DISCUSSION

Several reports suggest a significant association between celiac disease and autoimmune diseases (Valentino *et al.*2002). (Lauret, *et al.*2013) resulted that this association is still unclear, as well as the association with other autoimmune diseases. The causes for the onset and manifestation of associated diseases are diverse; some share a similar genetic base, like autoimmune thyroid disease (Grave’s disease and Hashimoto’s thyroiditis); others share pathogenic mechanisms, and yet, others are of unknown nature. General practitioners and other specialists must remember that CD may debut with extra intestinal manifestations, and associated illnesses may appear both at the time of diagnosis and throughout the evolution of the disease.

(Ch’ng, *et al.* 2007) resulted that there is strong association between CD and several immune mediated diseases, including autoimmune thyroid disorders, type 1diabetes mellitus, primary biliary cirrhosis, inflammatory bowel diseases and autoimmune adrenal failure. Some of these conditions share HLA haplotypes and non-HLA alleles. Our research showed agreement with the studies of (Ch’ng, *et al.* 2007) which showed that the thyroid disorders should be assessed in all CD patients at diagnosis and follow-up if clinically indicated. Our results are in agreement with it .

The present study results come in agreement with the studies of (Orgiazzi, Jacques. 2000) which showed that the autoimmune thyroid diseases share common immunologic markers mononuclear cell infiltration of the thyroid and circulating antithyroid antibodies, the specificities of which might, in Part, account for the diversity of these diseases. Autoantibodies against the thyroid-stimulating hormone receptor (anti TSH receptor antibodies, [TSHR-Ab]). Others include anti thyroperoxidase (TPO-Ab)

Our research showed agreement with the studies of (González, Concepción, et al. 2005) which showed that the tests most commonly employed for the diagnosis of AITD are measurements of anti-TPO and anti-Tg antibody serum levels.

CONCLUSION

There are a strong association between CD and autoimmune thyroid disorder

FUNDING

Nil.

CONFLICT OF INTERESTS

There are no conflicts of interest.

AUTHORS CONTRIBUTIONS

Mahdi M. Thuwaini (single author) drafted and approved the manuscript.

REFERENCES

- [1] Wieser, Herbert, and Peter Koehler. "The biochemical basis of celiac disease." *Cereal Chemistry* 85.1 (2008): 1-13.
- [2] Mearin, M. Luisa. "Celiac disease among children and adolescents." *Current problems in pediatric and adolescent health care* 37.3 (2007): 86-105.
- [3] Dhalwani, Nafeesa N., et al. "Women with celiac disease present with fertility problems no more often than women in the general population." *Gastroenterology* 147.6 (2014): 1267-1274.
- [4] Lauret, Eugenia, and Luis Rodrigo. "Celiac disease and autoimmune-associated conditions." *BioMed research international* 2013 (2013).
- [5] Ch'ng, Chin Lye, M. Keston Jones, and Jeremy GC Kingham. "Celiac disease and autoimmune thyroid disease." *Clinical medicine & research* 5.3 (2007): 184-192.
- [6] Cappa, Marco, Carla Bizzarri, and Francesca Crea. "Autoimmune thyroid diseases in children." *Journal of thyroid research* 2011 (2011).
- [7] Glick, Abigail B., et al. "Impairment of regulatory T-cell function in autoimmune thyroid disease." *Thyroid* 23.7 (2013): 871-878.
- [8] Fasano, Alessio. "Systemic autoimmune disorders in celiac disease." *Current opinion in gastroenterology* 22.6 (2006): 674-679.
- [9] Krupa-Kozak, Urszula. "Pathologic bone alterations in celiac disease: etiology, epidemiology, and treatment." *Nutrition* 30.1 (2014): 16-24.
- [10] Dittmar, M., et al. "Increased familial clustering of autoimmune thyroid diseases." *Hormone and Metabolic Research* 43.03 (2011): 200-204.
- [11] Mahdi, B. "Relationship between HLA typing and different diseases in IRAQ." *Cloning Transgenes* 2.2 (2013): 1000108.

- [12] Stazi, Anna Velia, and Biagino Trinti. "Selenium status and over-expression of interleukin-15 in celiac disease and autoimmune thyroid diseases." *Annali dell'Istituto superiore di sanita* 46 (2010): 389-399.
- [13] Lauret, Eugenia, and Luis Rodrigo. "Celiac disease and autoimmune-associated conditions." *BioMed research international* 2013 (2013).
- [14] Alessio, Maria G., et al. "Correlation between IgA tissue transglutaminase antibody ratio and histological finding in celiac disease." *Journal of pediatric gastroenterology and nutrition* 55.1 (2012): 44-49.
- [15] Wan, Kong-Sang, and Chyi-Sen Wu. "The essential role of anti-thyroid antibodies in chronic idiopathic urticaria." *Endocrine research* 38.2 (2013): 85-88.
- [16] Valentino, Rossella, et al. "Markers of potential coeliac disease in patients with Hashimoto's thyroiditis." *European journal of endocrinology* 146.4 (2002): 479-483.
- [17] Lauret, Eugenia, and Luis Rodrigo. "Celiac disease and autoimmune-associated conditions." *BioMed research international* 2013 (2013).
- [18] Orgiazzi, Jacques. "Anti-Tsh Receptor Antibodies in Clinical Practice." *Endocrinology and Metabolism Clinics of North America* 29.2 (2000): 339- 355.
- [19] González, Concepción, et al. "Clinical evaluation of a microsphere bead-based flow cytometry assay for the simultaneous 5 determination of anti-thyroid peroxidase and anti-thyroglobulin antibodies." *Clinical biochemistry* 38.11 (2005): 966-972.