

Celiac Disease, Diabetes & Crohn Disease: An Autoimmune Implosion?

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Abstract The autoimmune-related basis in the pathogenesis of celiac disease is merely supported by the increased frequency of association with other autoimmune disorders. We present a peculiar case report associating three different autoimmune disorders in a teenage boy: Celiac Disease, Type1 Diabetes and Crohn Disease.

Keywords: *celiac disease, diabetes mellitus type 1, Crohn disease, autoimmunity*

Cite This Article: Hakim Rahmoune, Nada Boutrid, Mounira Amrane, Ahmed Aziz Bousfiha, and Belkacem Bioud, "Celiac Disease, Diabetes & Crohn Disease: An Autoimmune Implosion?" *International Journal of Celiac Disease*, vol. 6, no. 2 (2018): 62-63. doi: 10.12691/ijcd-6-2-3.

1. Introduction

Celiac Disease (CD) is an autoimmune disorder triggered by gluten consumption in genetically susceptible individuals and characterized by the presence of a specific enteropathy [1].

It exhibits an indreasing worldwide prevalence, specially in North African Maghreb countries [2,3], and is frequently reported to be associated with other autoimmune conditions [4].

Here is summarized a rare association combining CD, Type1 Diabetes (T1D) and Crohn Disease (CrD).

2. Case Presentation

We report the case of a young male teenager aged thirteen and suffering from type 1 diabetes from several years and difficultly managed for his chronic, complicated dysglycemia..

He was diagnosed with T1D at age of 6, but could not achieve a balanced glycemia despite tight follow up and increasing insulin doses.

He suffers from refractory, watery, painful diarrhea since a couple of months is revealing a Celiac disease, confirmed by both serology and histology.

However, a gluten free diet could not reequilibrate his bowel and, specially, a capricious melena was noted; as well as persistant dyspepsia.

In fine, the boy was diagnosed (on endoscopy and histology) with a Crohn disease ... another autoimmune, chronic and hard-to-manage, condition.

Human leukocyte antigen (HLA) typing was ordered and confirmed the presence of both HLA DQ2 (leading to CD and T1D susceptibility) and HLA DR4 (well recognized as a severity biomarker in CrD)

3. Discussion

Autoimmune diseases associated to CD are widely and increasingly reported [4,5].

However, the peculiar association of these three conditions (e.g CD, T1D and Crohn Disease) is very uncommon: we performed a Medline search through Pubmed® using the Medical Subheading (Mesh) terms: "Diabetes Mellitus, Type 1", "Celiac Disease" and "Crohn Disease" with a final search request:

"Diabetes Mellitus, Type 1"[Mesh] AND "Celiac Disease"[Mesh] AND "Crohn Disease"[Mesh] "

Surprisingly, we retrieved only thirteen articles, and no similar case report using the Pubmed® Search Filter: "Case Report". [6]

Several pathophysiological similarities may explain this particular association:

-Immunity, at first: the autoimmune-related background of CD is confirmed by the frequent associations between different autoimmune disorders and CD. The association of CD and autoimmune disorders can be explained by the frequent finding of organ-specific autoantibodies, similar lymphocyte and mononuclear cell infiltrations at target organ level, and common HLA phenotypes [7].

- Genetics: mainly through the above mentioned HLA. Associations between HLA antigens and autoimmune diseases were reported since the 1970s. After the development of wide-screen genotyping and finemapping, HLA was increminated in major autoimmune diseases like CD, Rheumatoid Arthritis, psoriasis, ankylosing spondylitis, systemic lupus erythematosus, Type 1 Diabetes, multiple sclerosis, Graves disease, and dermatomyositis [1,8]

CD is strongly associated with the HLA: more than 95% of patients with CD share the HLA-DQ2 heterodimer,

and the remainder present the HLA-DQ8 heterodimer, both located on chromosome 6 [9].

In a modern context of increased prevalence of CD as well as other autoimmune diseases, HLA typing emerges as an important tool to discriminate individuals genetically susceptible to develop CD or T1D in at-risk groups such as those with autoimmune conditions [10].

- Finally, the involvement of intestinal hyperpermeability in the common genesis of these three conditions [11,12,13], as well as the expanding role of the gastrointestinal microbiota [14,15,16], complete the puzzle of such an "autoimmune implosion".

4. Conclusion

Several autoimmune disorders may share, at least partially, the same immunogenetic core (i.e. HLA) that could be analysed in the early management of targeted autoimmune conditions in order to guide future treatment.

Keep in mind that an autoimmune dysregulation may predispose to other ones with a potential deep impact on clinical management.

Acknowledgements

The authors would thank the biochemistry laboratory at University Hospital of Setif for kind collaboration.

References

- [1] Rahmoune H, Boutrid N, Bioud B. HLA & Celiac Disease. Moroccan Health Journal, 2017; 18: 14-15.
- [2] Catassi C, Ratsch IM, Gandolfi L, Pratesi R, Fabiani E, El Asmar R, Frijia M, Bearzi I, Vizzoni L. Why is coeliac disease endemic in the people of the Sahara?. The Lancet. 1999 Aug 21; 354(9179): 647-8.
- [3] Barada K, Bitar A, Mokadem MA, Hashish JG, Green P. Celiac disease in Middle Eastern and North African countries: a new burden? World J Gastroenterol 2010; 16: 1449-1457.
- [4] Fasano A. Systemic autoimmune disorders in celiac disease. Current opinion in gastroenterology. 2006 Nov 1; 22(6): 674-9. 7.
- [5] Kang JY, Kang AH, Green A, Gwee KA, Ho KY. Systematic review: worldwide variation in the frequency of coeliac disease and changes over time. Alimentary pharmacology & therapeutics. 2013 Aug 1; 38(3):226-45.
- [6] <https://www.ncbi.nlm.nih.gov/pubmed> .accessed on april 20th, 2018.
- [7] Volta U, De LF, Molinaro N, Tetta C, Bianchi FB. Organ-specific autoantibodies in coeliac disease: do they represent an epiphenomenon or the expression of associated autoimmune disorders?. Italian journal of gastroenterology and hepatology. 1997 Feb; 29(1):18-21.
- [8] Pallav K, Kabbani T, Tariq S, Vanga R, Kelly CP, Leffler DA. Clinical utility of celiac disease-associated HLA testing. Dig Dis Sci 2014; 59: 2199-206.
- [9] <https://emedicine.medscape.com/article/1790189>. accessed on april 20th, 2018.
- [10] Rahmoune H, Boutrid N, Amrane M, Bioud B. HLA genes as a predictive screening tool for celiac disease. Turk Pediatri Ars 2017; 52: 182-4.
- [11] Fasano A. Leaky gut and autoimmune diseases. Clinical reviews in allergy & immunology. 2012 Feb 1; 42(1): 71-8.
- [12] Krug SM, Schulzke JD, Fromm M. Tight junction, selective permeability, and related diseases. In Seminars in cell & developmental biology 2014 Dec 1 (Vol. 36, pp. 166-176). Academic Press.
- [13] Teshima CW, Dieleman LA, Meddings JB. Abnormal intestinal permeability in Crohn's disease pathogenesis. Annals of the New York Academy of Sciences. 2012 Jul 1; 1258(1): 159-65.
- [14] Cenit MC, Codoñer-Franch P, Sanz Y. Gut microbiota and risk of developing celiac disease. Journal of clinical gastroenterology. 2016 Nov 1; 50: S148-52.
- [15] Chan D, Kumar D, Mendall M. What is known about the mechanisms of dietary influences in Crohn's disease?. Nutrition. 2015 Oct 1; 31(10): 1195-203.
- [16] Needell JC, Zipris D. The role of the intestinal microbiome in type 1 diabetes pathogenesis. Current diabetes reports. 2016 Oct 1; 16(10): 89.