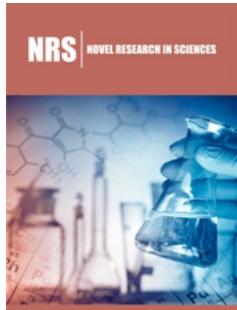


Celiac Disease and Intestinal Microbiota Transplantation

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Summary

Celiac disease (CD), an autoimmune disease that affects genetically prone people, with an immune response to gluten, occurs very frequently. The importance of the Microbiome and particularly the Intestinal Microbiota has been demonstrated. The transplant may be helpful, taking into account all the precautionary measures issued by the FDA. Don't forget the use of probiotics, diet and minimization in the use of antibiotics.

Keywords: Microbioma; Microbiota

Abbreviations: CD: Celiac Disease; IM: Intestinal Microbiota; IMT: Intestinal Microbiota Transplantation

Introduction

Celiac Disease (CD), an autoimmune disease of the gut, which affects genetically prone people, with an immune response to gluten [1]; Very common disease, secondary to environmental (gluten) and genetic processes (human leukocyte antigen and genes not human leukocyte antigen) [2]. Autoimmune disorder, with innate and adaptive immune response, which occurs in genetically prone people, exposed to gluten and other factors environmental [3]. Any of these definitions orients towards the autoimmune process, not localized to the digestive tract, since it has extraintestinal manifestations [4]. This translates a number of signs and symptoms, among which are: Digestive disorders, characterized from diarrhea, vomiting, bloating, and pain; constipation, pale, oily, and foul-smelling stools; skin rash, anemia, fatigue, weight loss, and painful joints, as well as short stature, elevated liver enzymes, neurological problems, and impaired bone metabolism. The data being similar in children and adults [5,6]. The diagnosis is confirmed with: Tissue anti-transglutaminase; IgA (Included in all guides) [7]. Endomysial antibodies; IgA (They have adequate sensitivity and specificity; they are usually used in disease activity or when there is dermatitis herpetiformis) [8]. Anti-gliadin antibodies; IgA (May be positive; Depends on antibody isotype and age at diagnosis of CD [9]. HLA-DQ2 or HLA-DQ8 heterodimer. CD is associated with HLA-DQ2 heterodimer and, to a lesser extent with HLA-DQ8 with the presence of the HLA DQ2 and DQ8 alleles [10].

The Video endoscopic capsule (contraindicated in some conditions: stenosis, previous radiation or surgical resection of the small intestine, clinical data of obstruction or pregnancy). In other cases, it can be used, including patients who want to avoid duodenal biopsy [11]. Finally, endoscopy with duodenal biopsy (considered the "gold standard", although there are discussions about the precise location of the capture. (Villus atrophy guides the diagnosis) [12]. Once the diagnosis has been made, oats, rye and barley must be excluded [13].

Comments

Microbiome and celiac disease: If there are bacterial changes in the composition of the microbiome, the risk of autoimmunity increases. And with-it Celiac Disease. The previous

phenomenon known as dysbiosis is involved in the condition [14]. It has been discovered that not only the non-HLA (Human Leukocyte Antigen) genome affects CD, there are also others, and these are related to the Intestinal Microbiota [15]. On the other hand, it has been pointed out that both gluten and microbiota are genesis of CD, but not sufficient [16]. It has to do in this context with the aspects that involve gluten intake, the quantity, the quality, the age at which it appears in the diet, as well as the type of intake [17]. The most important part of the Microbiome in relation to CD is the Gut Microbiota.

Gut microbiota and celiac disease: The most important thing to avoid the development of CD is to maintain a healthy Microbiota [18]. If it becomes ill, it can lead to activating an inflammatory process, since the intestinal mucosa is mediated by innate immunity, through the same receptors [19]. Compared with healthy subjects, people with the Disease have a reduced number of beneficial microorganisms, with an increase in potential pathogens [20]. Abnormal immune processes produce inflammation and influence the balance of the Intestinal Microbiota [21]. Likewise, the excess of antibiotics, the elimination of some parasites (nematodes) and diet changes generate a Gut Microbiota that has no resistance [22-24]. Intestinal Microbiota (IM) exercises health defense and is immersed in nutritional and metabolic processes, playing an important role in the pathophysiology of numerous diseases [25]. The IM in the celiac patient is different from the normal ones and it is usually found in children, a lower quantity of Bifidobacteria and Lactobacilli [26]. At this age and in adults there are more harmful bacteria, represented by Proteobacteria and Bacteroides [27]. Likewise, more strains of *E. coli*, more virulent, have been detected in children [28]. Finally, celiac sufferers tend to have a higher percentage of pathogens or proinflammatories than those who don't have problems [29].

Dysbiosis and celiac disease: Although it can be defined as inflammation, we can determine it as disturbances of the Gut Microbiota, which usually produces some disease. And it occurs through the mismatch between pathogens and diners [30]. It has been shown in children and adults, and the factors that produce it are being elucidated. Genetics have been considered within them, as well as the products of interaction between the microbiome and the diet [31]. It is striking that in Celiac Disease, once the gluten-free diet is established, dysbiosis can remain, which would speak of environmental factors linked to the problema [32]. Among these factors, diet is included as a determining process of dysbiosis [33]. On the other hand, it has been determined that antibiotics cause inflammatory processes of the Intestinal Microbiota, which complements the knowledge about the multimentioned dysbiosis [34].

Intestinal microbiota transplantation and celiac disease: In case you decide that you have to carry out Intestinal Microbiota Transplantation in EC, you must take into account the latest opinions that the FDA makes in this regard. Among them are the potential risk of transmission of pathogenic bacteria, such as enteropathogenic *Escherichia coli* and *E. coli* producing Shigatoxin

[35]. The FDA warned that SARS-CoV-2, which causes COVID-19, can be transmitted by faecal samples, so we must be very careful of the above, to avoid it [36]. Used product prepared before November 1, 2019, and a PCR test for the detection of COVID-9, to the donor sample, prior to transplantation, as well as a search for enteropathogenic *E. coli* and *E. coli* producer of Shigatoxin. Indirectly, both the symptoms of Celiac Disease and the size of the duodenal villi have been improved, by performing TMF, to treat *C. difficile* (CD) infection, which is highly interesting [37]. Likewise, they have been improved in patients with various diseases, including CD [38]. There is evidence that transplanted IM improves autoimmune disorders, although it is still being studied, since some authors demand large, double-blind and randomized cohort studies; therefore, they determine that there is still time to make the IMF a complete reality [39,40]. In Europe, 28 experts from 10 countries determined that management with Gut Microbiota is adequate and suggest that more specialized centers be developed for their study, in order to determine regulations and technical documents, both administrative and laboratory, for *C. difficile* infection and other conditions [41]. Lastly, in World Centers, the inappropriateness of using antibiotics in the IMF for *C. difficile* is determined, which includes CD and other conditions [42].

Probiotics and celiac disease: A question that is beginning to have answers is: Do probiotics improve Celiac Disease? In other words, the ingestion of beneficial bacteria could help restore the harmony of IM. Some studies say yes, for example the use of *Bifidobacterium longum* CECT 7347 in children with Celiac Disease [43]. Or, the effect of *Bifidobacterium NLS*, by improving gastrointestinal symptoms [44]. Although most of the experiments have been carried out in animals, there are studies in humans, which translate into a positive effect. The need for more studies to treat CD with probiotics is reiterated.

Conclusion

- I. CD, a very frequent autoimmune disease, is diagnosed with relative ease and should be treated, starting with a gluten-free diet.
- II. Not only the Human Leukocyte Antigen has to do with genesis, but also the Intestinal Microbiota.
- III. Maintaining a healthy Intestinal Microbiota is relevant in Celiac Disease.
- IV. Diet changes, the elimination of nematodes and excess antibiotics produce a Microbiota without resistance and, consequently, increase the risk of Celiac Disease.
- V. Despite maintaining the Gluten-Free Diet, intestinal dysbiosis may persist. IMF, without forgetting the recommendations of the FDA and probiotics, favor Celiac Disease, although more studies are required.

Conflicts of Interest

The authors declare don't have affiliation or participation in organizations with financial interests.

Ethical Approval

This report does not contain any study with human or animal subjects carried out by the authors.

Informed Consent

The authors obtained informed written consent from the patients, in order to develop this article.

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