

## Autism Spectrum Disorder and Transplantation of Intestinal Microbiota

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### Abstract

Autism Spectrum Disorder (ASD) is undoubtedly an extraordinarily frequent condition and generator of great anxiety in its environment. Lately, considerations have been made regarding the effect that Intestinal Microbiota Transplantation (IMT) can have on the modulation of neurological development. The close relationship between the intestinal microbiota (IM) and Autism Spectrum Disorder (ASD) has been proven, as well as the frequent occurrence of gastrointestinal symptoms in children with autism. For the previous reason, we have carried out a mini review where we observe how interesting the Fecal Microbiota Transplant (FMT) can be, accompanied by other procedures, in the search for the minimization of this great problem.

**Abbreviations:** ASD: Autism Spectrum Disorder; IMT: Intestinal Microbiota Transplantation; IM: Intestinal Microbiota; FMT: Fecal Microbiota Transplantation

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### Commentary

Autism is pathology, which affects from 0.1% to 1.8 of the world population. Numerous articles have sprung up in the world literature about the power of Intestinal Microbiota (IM) in Autism Spectrum Disorder (ASD). All of them deal with how (IM) acts by modulating neurological development [1-4]. Undoubtedly one of the best articles published is that of Kang Dae-Wook, where Thomas Borody and Alexander Khoruts appear, a group that has vast experience in performing Fecal Microbiota Transplants, including Autism Spectrum Disorder (ASD), mention that the relationship between this pathology and Intestinal Microbiota is close, and that autistic patients frequently suffer from gastrointestinal disorders, usually constipation, due to Irritable Bowel Syndrome (IBS), related to the severity of the process and associated with deterioration in language. To do this, they point out that the link between IM-ASD has been confirmed in mice and show 18 children with ASD treated with TMT and its encouraging results [5,6]. Some components such as peptides, immunoglobulin A and mucus cause stimulation or inhibition of bacterial development. Others such as antibiotics and diet disrupt the proper functioning of MI. For this, it is necessary to modulate this operation, with IMT, pro, pre or symbiotic, to avoid the appearance of pathologies [7]. The same previous conclusion was reached in the analysis of nine studies, including 254 patients with ASD, which suggests an association between ASD and the alteration of MI [8]. The same is explained, [9] adding that from the discovery of the Intestine-Microbiota-Brain Axis, the process begins to be understood. They also suggest the use of diets, pre-pro and symbiotics, as well as FMT, to improve patients with ASD [10-12]. Sharon G et al. [11] carry out Intestinal Microbiota transplantation in germ-free mice and induce autistic behaviors, which highlights the impact of the Intestinal Microbiota [13].

In order to have adequate technological tools, we can rely on these protocols to examine the intestinal microbiome through sequencing-based analysis [14-16]. Chaidez et al. [15], in a study of 960 children with: ASD, normal development or developmental delay detect, in addition to constipation, diarrhea, gas and abdominal pain. Observing that this symptomatology is of greater presence in young children [17]. The enormous time and expense that is required in the therapies provided to autistic children is known. Because of this, it is necessary to consider

that sensory modulation occurs, generally at an early age, for which the personnel dedicated to this type of support should consider the needs of young children [18].

IL-18 has been considered because it is high in the brain and low in serum, as a marker in ASD. What once determined, could be added to the brain-derived neurotrophic factor, within the diagnostic supports [19].

Facial clinical manifestations in the autistic help a lot to integrate the diagnosis. Of course, these findings should be complemented with other clinical data [20]. It has been observed in the ASD there is proliferation of the glia, due to the effect of propionic acid (product of the dysbiosis intestine), through PTEN / AKT, a natural inhibitor [21,22]. Regarding the viruses that inhabit the intestine, they have also been studied, by metagenomic sequencing, determining that they are usually unique, in each person [23]. The size of the microbiome is also modulated by viruses. Likewise, viruses influence their diversity, gene flow and metabolism. These conclusions are the product of oceanic research, in addition to detecting great diversity [24]. Although sequencing techniques have varied somewhat in their process, the results, although similar, are a bit finer. Deng et al. [23], detected non-redundant data from contigs. Obtaining 4659 non-redundant viral sequences, which can be used to optimize the results of the Viroma analysis [25].

In relation to management with prebiotics, probiotics or symbiotics, the results regarding their efficiency vary [26-28]. We consider the definition of probiotic transcendent: Substrate that the host microorganisms selectively use and confer health benefit [29]. Ng QX et al. [28] point out that probiotics do not positively affect depression, after having carried out meta-analysis [30,31]. We consider that probiotics, prebiotics or symbiotics do not act alone, but rather, personalized diet, stress management and microbiota should be added.

In children with ASD, intestinal bacteria are usually less diverse, although the diversity affected by Vancomycin is restored, these changes appear in the bacteria

## Conclusion

- A. The Intestinal Microbiota (IM) has power over the Autism Spectrum Disorder (ASD).
- B. Children with ASD usually have constipation.
- C. The use of special diet, probiotics and Intestinal Microbiota Transplantation (IMT) in unison often impacts and improves children with ASD

## Conflicts of interest

The authors declare that do NOT 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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