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Mini Review

Intestinal Microbiota Transplantation. New Technique

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Abstract

The authors present a new method for intestinal microbiota transplantation (IMT) which includes procedures to improve donors. This new technique may be of interest to the scientific and medical communities since it could decrease costs and help individuals that require an IMT.

Keywords: *Intestinal Microbiota; Microbiota Transplantation; Fecal Microbiota Transplantation*

New technique

After the selection of the donor, we informed them thoroughly about the technique, and if the participation in the study was granted, the donor provided us with the required amount of stools for the procedures. We explained to the candidate the purpose and method of the study and answered all pertinent questions. If the individual accepted to enroll, they signed the informed consent that proved her/his willingness to take part in the study. Subsequently, they received 2 to 4 mg of loperamide according to bowel movement frequency.

With this approach, we underline the importance of new techniques and procedures to improve the IMT.

Table 1 assessment of comorbidities that contraindicate the use of donors, as well as the different studies that may be required to make the donor valid for a successful IMT.

Process

After the preparation of the stools, the resulting microbiota is dissolved in water with two spoons of chocolate powder, sugar or a sweetener. In this form, the IMT is ready for administration.

The organization of the area for the administration of the IMT is designed to reduce stress for transplant recipients. The area is well illuminated and has soft ambient music that plays from a jukebox. Also, it contains a soda fountain and tables are colored. The IMT is offered in a one-liter shaker bottle.

Soft music (same as the ambient music) is provided to the patient using headphones. If the smell of the preparation is perceived as unpleasant by the transplant recipient, a plastic nose clip device can be used to close her/his nostrils.

If the recipient is a child, the child's parents are seated alongside the patient. The parents also drink a milkshake that has the same color, volume and general appearance of the IMT mixture.

The IMT preparation will be administered without the use of straws to avoid the contamination of the area. Soon after ingestion, a 2-mg loperamide tablet will be provided to the patient. At all times, medical personnel will be available, and if the patient reports gastrointestinal manifestations, the physician will assess the symptoms and reassure the patient if the event is considered transitory.

When the previous procedures are finished, the headphones and nasal clip are then removed. Music will be maintained for 20 to 30 minutes after all procedures are finished.

IMT may be a treatment alternative for patients with any of the following indications:

Food allergy, Nervous anorexia, Autism (isolated cases) [1], *C. difficile* diarrhea, Fulminating colitis, Type 1 diabetes mellitus, Severe diarrhea due to antibiotics, Severe, non-reversible diarrhea, Atopic diseases (asthma and eczema), Celiac disease, Inflammatory bowel disease (greater improvement in ulcerative colitis than in Crohn's disease), Parkinson's disease (isolated cases) [2], Pseudomembranous enterocolitis, Multiple sclerosis, Chronic constipation, Morbid obesity, Idiopathic thrombocytopenic purpura, Myoclonic dystonia, Syndrome and chronic diarrhea [3], Irritable bowel syndrome, Chronic fatigue syndrome, Metabolic syndrome, Bacterial overgrowth, Collagenous sprue, Tropical sprue, Eosinophilic disorders of the digestive system, Neurodegenerative disorders and neurodevelopmental disorders.

Comments

A long time ago, Ge Hong used to do a similar procedure of IMT. However, we expand the former experience by using a stress-free environment, soft music, and nasal occlusion to improve the IMT approach [4-6]. Our method avoids the risks of endoscopy and anesthesia [7-9]. These studies may be reserved for patients in whom the diagnosis has not been established [10-12], while, the new method may be carried it out in individuals in whom the diagnosis has been confirmed, and who do not require biopsies or any other diagnostic process [13-15].

With the present proposal, we hope to stimulate physicians to use this technique, which will undoubtedly bring benefits to patients with many diseases susceptible to be treated with IMT [16-19].

By comparing this new method with others, we find the following:

- **Use of a nasogastric tube:** Some complications of the feeding tubes are: obstruction of the probe, accidental migration of the probe (which may cause altered peristaltic activity), nasal erosions, necrosis and abscess of the nasal septum. Acute sinusitis, hoarseness, otitis, esophagitis, esophageal ulceration, esophageal stenosis, tracheoesophageal fistula and esophageal perforation. Pulmonary complications include pulmonary aspiration, hydrothorax, pneumothorax, pulmonary hemorrhage, empyema, bronchopleural fistula, pneumonia, and subcutaneous emphysema [20].
- **Direct intake of the microbiota:** The first obstacle to this approach is the unpleasant smell of the IMT preparation. With the use of this technique, we reduce such problem and enhance the preparation tolerance.
- **Microbiota containing capsules administration.** We supply 40 microbiota containing capsules to the patient which usually make this technique difficult and unreliable, since the patient develops nausea and vomiting early in the process [21].
- **Systematic use of endoscopy:** This procedure is expensive, cumbersome, and is not exempt from risks. During the endoscopy, some individuals experience shortness of breath after the introduction of the endoscope throughout the mouth. However, this improves with local anesthesia. If a patient develops dyspnea, it is important to let them know that there is enough space around the endoscope to allow normal breaths. Moreover, it is important to instruct them to keep calm and take deep breaths. Patients may notice discomfort such as nausea, abdominal cramping or bloating while the procedure is performed. If any of the preceding symptoms ensue, the patient may use a previously agreed signal to let the physician know about it [22]. As mentioned before, an endoscopy should not be used if the patient has already been diagnosed. Furthermore, these types of procedures must be done by an expert. All of the above are disadvantages for using endoscopy in IMT. In contrast, the proposed technique is easy to do, cheap, and avoids the need for endoscopic studies.

Conclusions

We are certain that the New Technique described for Microbiota Transplantation through the oral route is a new support in the medical therapeutic arsenal. Easy to handle, with economic, discrete impacts. With simple acceptance and favorable results.

We consider that it should be instrumented, for the benefit of children affected with various conditions, treatable with Microbiota.

Undoubtedly, when we treat an affected child, the clinical response is much better than when we handle an adult or an older person.

We hope that the current document will stimulate the Pediatricians to manage affected children with this new technique, in order to evaluate it and tend to correct in a more effective way, the different pathologies that are presented and that have been demonstrated can be improved with the Microbiota Transplant, as the inflammatory process by *Clostridium difficile*, Irritable Bowel Syndrome, dyspepsia, Inflammatory Bowel Disease and many psycho-neurological pathologies.

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