CellMed
Orthocellular Medicine and Pharmaceutical Association

Case Report

세포교정영양요법(OCNT)을 이용한 소장 세균 과증식 (SIBO) 개선 사례

조종빈 약사
전라남도 화순군 화순읍 자치샘로 42-2 셀메드화순종로약국

A Case Study on Improving Small Intestinal Bacterial Overgrowth (SIBO) Using Ortho-Cellular Nutrition Therapy (OCNT)

Pharmacist, Jong-Bin Jo
Cellmed Hwasun Jongro Pharmacy, 42-2, Jachisam-ro, Hwasun-eup, Hwasun-gun, Jeonllanam-do, Republic of Korea

ABSTRACT
Objective: Report of a case study on the improvement of Small Intestinal Bacterial Overgrowth (SIBO) using Ortho-Cellular Nutrition Therapy (OCNT).
Methods: OCNT was administered to a Korean male patient in his 80s suffering from frequent diarrhea, rapid weight loss, and difficulty eating.
Results: After administering OCNT, the patient's physical condition improved, allowing him to eat and regain strength, with some restoration of walking ability.
Conclusion: The application of OCNT can help alleviate symptoms in patients suffering from diarrhea and nutrient malabsorption due to SIBO.

Keywords: Ortho-Cellular Nutrition Therapy (OCNT), Small Intestinal Bacterial Overgrowth (SIBO), gut bacteria

Introduction

Small Intestinal Bacterial Overgrowth (SIBO) is a gastrointestinal disorder characterized by an excessive growth of bacteria and other microbes in the small intestine above normal levels. While it is normal for some bacteria to be present as the small intestine nears the colon, their numbers are significantly lower compared to those in the colon.[1] However, when these microbes proliferate excessively, they produce various toxins which are not properly expelled, leading to diarrhea and nutrient deficiencies (malabsorption) among other symptoms.

The small intestine breaks down a variety of foods including carbohydrates, proteins, and dietary fibers, and absorbs nutrients. It also has an immune function that prevents the infiltration of microbes into the gastrointestinal tract.[2] However, patients with SIBO have damaged intestinal cells and mucosa due to accumulated toxins, leading to decreased intestinal function. Additionally, the movement of intestinal contents is restricted, and certain gut bacteria overgrow, excessively using nutrients that should be absorbed.[3] As a result, chronic diarrhea and nutrient absorption disorders can occur, and some patients may experience gastrointestinal symptoms such as unintended weight loss, abdominal pain, vomiting, and bloating.

Previously, SIBO was thought to be limited to patients with anatomical abnormalities in the upper gastrointestinal tract or issues with intestinal motility. Modern diagnostic methods such as microbial analysis of aspirated intestinal fluid and breath tests have been developed. Decreased secretion of digestive enzymes (stomach acid, bile, pancreatic juice), lack of peristalsis in the small intestine, excessive intake of refined sugars, ileocecal valve dysfunction, impaired immune function, food allergies, stress, and decreased levels of secretory IgA are reported as complex causes. However, these diagnostic methods are subject to controversy regarding their sensitivity and specificity.[4]

The optimal test for diagnosing SIBO does not yet exist, making the treatment approach complex and dependent on the patient's condition. The most crucial treatment method is addressing the underlying condition, and surgery is most effective for structural or internal medical issues. Additionally, it is essential to resolve deficiencies in nutrients for patients experiencing weight loss or deficiencies in vitamins and minerals. Finally, antibiotic treatment is used to eliminate the bacteria causing the condition.[5] However, due to the diversity of gut microbiota, the approach of which antibiotics to administer and how much is not highly effective in actual clinical settings. Therefore, it is considered most efficient to conduct treatment based on the analysis of aspirated small intestinal fluid.[6]

The patient in this case was diagnosed with gastrointestinal dysfunction before the implementation of Ortho-Cellular Nutrition Therapy (OCNT) and had severe symptoms, including

*Correspondence: Jong-Bin Jo
E-mail: jongro3720178@hanmail.net
Received Seo 30, 2024; **Accepted** Sep 30, 2024; **Published** Sep 30, 2024
doi: http://dx.doi.org/10.5667/CellMed.spc.099

† This report has been translated and edited by the CellMed editor-in-chief, Prof. Beom-Jin Lee.

frequent diarrhea that made regular eating difficult. This led to rapid weight loss and difficulty moving. Thus, OCNT was administered to improve the patient's symptoms.

Case Study

1. Subject

A case of a patient with SIBO was studied.

1) Name: Jeong OO (80/M)
2) Diagnosis: Nutrient malabsorption due to Small Intestinal Bacterial Overgrowth (SIBO)
3) Date of Onset: Early 2019
4) Treatment Duration: August 2019 to February 2020
5) Primary Symptoms: Frequent diarrhea, weight loss, vertigo (dizziness), and decreased physical strength
6) Medical History: Heart failure, type 2 diabetes, undergoing nephrology monitoring due to ankle edema and pain
7) Social history: None
8) Family History: None
9) Medications and Treatments Applied: Heart failure, hypertension, gastrointestinal medications, and painkillers. Diabetes medication was also prescribed but discontinued due to low body weight.

2. Methods

The OCNT prescribed to the patient is displayed in Table 1.

Results

The patient in this case is an elderly male in his 80s with various underlying conditions such as heart failure, diabetes, and edema, and has been on long-term medication related to these conditions. This led to gastrointestinal dysfunction, excessive diarrhea, and difficulties with eating. Despite undergoing tests for the bile ducts and pancreas at a major hospital and being told there were no significant abnormalities, no further treatment was provided Over time, his daily food intake drastically reduced to just a few spoonfuls, his symptoms significantly worsened, and he lost over 20 kg in weight.

The primary focus was on helping the patient recover his nutritional status and strength. Despite having various underlying diseases like heart failure and diabetes, he had stopped taking his medications due to weight loss. Thus, improving the patient's health to aid in regular medication treatment was crucial. OCNT was implemented to provide a rich supply of nutrients, improve the intestinal environment, and support a healthy gut microbiome.

About 20 days after applying OCNT, the patient's physical condition improved sufficiently to enable normal eating and nutrient intake. Two months later, he improved to the point where he could walk with the aid of a cane. At the end of the OCNT treatment, he was able to regain overall health and discontinue all medications except for the minimal necessary prescriptions. He could soon return to normal daily activities. The severity of symptoms experienced by the patient during OCNT is shown in Table 2.

Discussion

The patient in this case suffered from nutrient absorption disorders due to Small Intestinal Bacterial Overgrowth (SIBO) and was in very poor health due to frequent diarrhea and weight loss. He had underlying conditions of heart failure and diabetes, which could be significantly linked to long-term medication use affecting gastrointestinal motility.

Table 1. OCNT Prescription Details for the Patient.

Prescription \ Month	1	2	3	4	5	6	7 ~
Cyaplex A granules	111	111	111	111	111	111	101
Eufaplex Alpha stick	-	101	101	101	101	101	-
Tmplex F Granules	010	010	010	010	010	010	-
Nutaplex	101	101	101	101	101	101	-
Enzaplex F	111	111	111	111	101	101	-
Bioplex F	111	111	111	111	101	101	-
Calmaplex Granules	101	101	101	101	101	101	-

* 111: Take three times a day, one sachet each in the morning, lunch, and evening. 101: Take twice a day, one sachet each in the morning and evening. 010: Take once a day, one sachet at lunch.

Table 2. Discomfort Levels Experienced by the Patient During OCNT. The degree of discomfort increases from 0 to 5.

Symptoms \ Month	1	2	3	4	5	6
Diarrhea	5	2	1	1	0	0
Eating Status	5	3	1	1	0	0
Weight Loss	5*	4	2	2	1	1
Vertigo (Dizziness)	5	4	3	2	1	1
Physical Strength Decline	5	3	2	1	1	0
Ankle Edema	5	4	3	2	1	1

* The patient was in a situation where he had lost more than 20kg.
** 0: No symptoms, no impact on daily life. 1: Mild symptoms, almost no impact on daily life. 2: Moderate symptoms, slight adaptation needed for daily activities. 3: Significant symptoms, some difficulty in performing activities. 4: Severe difficulty in performing daily activities. 5: Daily life significantly impacted, causing severe stress.

SIBO can be caused by a reduction in normal intestinal motility, decreased secretion of digestive fluids, and diminished immune function, which can lead to bacterial overgrowth in the intestines. Both heart failure and diabetes, the patient's underlying diseases, can inhibit normal gastrointestinal motility; diabetes, in particular, is known to damage the intestinal nervous system, reducing peristaltic motion. Research indicates that about 43% of diabetic patients with chronic diarrhea also have SIBO.[7]

Among the medications the patient was taking, diuretics promote fluid excretion but can cause electrolyte imbalances, affecting gastrointestinal function and potentially causing diarrhea. Furthermore, medications like beta-blockers can affect intestinal smooth muscle, reducing intestinal motility. This can cause food to stay longer in the small intestine, promoting excessive bacterial growth and contributing to SIBO.

The OCNT prescribed to the patient is intended to improve the intestinal environment and ensure sufficient nutrient supply. The components of OCNT can contribute to alleviating symptoms associated with SIBO through various functions. For example, anthocyanins can aid in increasing *Bacteroidetes*, reducing *Firmicutes* and intestinal permeability, and improving the gut environment,[8] Hibiscus extract can exert a bactericidal effect against *Staphylococcus* and *Listeria monocytogenes* and enhance the expression of proteins that maintain the mucosal barrier, thereby strengthening intestinal health.[9,10]

Omega-3 fatty acids can increase beneficial bacteria such as *Prevotella* and *Parabacteroides*, while decreasing *Firmicutes* including *Lactobacillus*, *Clostridium cluster XIVa*, *Lachnospiraceae*, and *Streptococcus*, thus aiding in the composition of the gut microbiota.[11] They are also known to strengthen the small intestine mucosa and reduce intestinal inflammatory responses.[12]

Furthermore, trace nutrients like zinc can enhance immune function by increasing the expression of secretory IgA (sIgA) and are reported to alleviate symptoms such as diarrhea in children.[13,14] Chlorella contains most essential amino acids and various bioactive compounds necessary for humans and animals, and animal studies have shown that intake of chlorella leads to the development of intestinal mucosa and an increase in beneficial bacteria.[15] Additionally, the consumption of chlorella has been reported to reduce plasma toxin levels.[16]

Dextrin has been found to induce the growth of beneficial bacteria that produce butyric and acetic acid, and it reduces the secretion of inflammatory cytokines in a colitis mouse model.[17] Fructooligosaccharides, a prebiotic like dextrin, increase beneficial bacteria such as *Bifidobacterium*.[18] Vitamin D plays a crucial role in maintaining intestinal health by upregulating the expression of occludin and regulating immune functions.[19]

The supply of these nutrients is vital in improving the patient's gut microbiome, promoting the proliferation of beneficial bacteria, and protecting the intestine from harmful bacteria and bacterial toxins. Gut beneficial bacteria perform essential functions in maintaining intestinal health by aiding nutrient absorption, strengthening the intestinal barrier, and regulating inflammation. An increase in beneficial bacteria can suppress the proliferation of harmful bacteria and stabilize the intestinal environment.

This study is based on a single case, which presents limitations in generalizing the results. However, the patient experienced significant improvements in physical condition about 20 days after administering OCNT, enabling normal eating, and subsequent weight loss reduction. Two months later, the patient regained enough strength to walk with a cane, suggesting that OCNT may help restore daily life functions. This report is made with the patient's consent, highlighting the potential benefits of OCNT in enhancing quality of life.

References

1. Drasar B, Shiner M, McLeod G. Studies on the intestinal flora: I. The bacterial flora of the gastrointestinal tract in healthy and achlorhydric persons. *Gastroenterology.* 1969;56(1):71-79.
2. Collins JT, Nguyen A, Badireddy M. Anatomy, Abdomen and Pelvis, Small Intestine. In: *StatPearls.* Treasure Island (FL): StatPearls PublishingCopyright © 2024, StatPearls Publishing LLC.; 2024.
3. Fan X SJ. Review article: Small intestinal bacterial overgrowth, bile acid malabsorption and gluten intolerance as possible causes of chronic watery diarrhoea. . *Aliment Pharmacol Ther.* 2009 May 15;29(10):1069-1077.
4. Dukowicz AC LB, Levine GM. Small intestinal bacterial overgrowth: a comprehensive review. *Gastroenterol Hepatol.* 2007 Feb;3(2):112-122.
5. Haboubi NY LG, Montgomery RD. Duodenal mucosal morphometry of elderly patients with small intestinal bacterial overgrowth: response to antibiotic treatment. . *Age Ageing.* 1991 Jan;20(1):29-32.
6. Bouhnik Y AS, Attar A, Flourié B, Raskine L, Sanson-Le Pors MJ, Rambaud JC. . Bacterial populations contaminating the upper gut in patients with small intestinal bacterial overgrowth syndrome. . *Am J Gastroenterol.* 1999 May;94(5):1327-1331.
7. Virally-Monod M TD, Kevorkian JP, Bouhnik Y, Flourie B, Porokhov B, Ajzenberg C, Warnet A, Guillausseau PJ. . Chronic diarrhoea and diabetes mellitus: prevalence of small intestinal bacterial overgrowth. . *Diabetes Metab* 1998 Dec;24(6):530-536.
8. Verediano TA SDMH, Dias Paes MC, Tako E. . Effects of Anthocyanin on Intestinal Health: A Systematic Review. *Nutrients.* 2021 Apr 17;13(4):1331.
9. Majdoub YOE GG, Mandalari G, Dugo P, Mondello L, Cacciola F. The Digestibility of Hibiscus sabdariffa L. Polyphenols Using an In Vitro Human Digestion Model and Evaluation of Their Antimicrobial Activity. *Nutrients.* 2021 Jul 10;13(7):2360.
10. Diez-Echave P VT, Rodríguez-Nogales A, Ruiz-Malagón AJ, Hidalgo-García L, Garrido-Mesa J, Molina-Tijeras JA, Romero M, Robles-Vera I, Pimentel-Moral S, Borras-Linares I, Arráez-Román D, Segura-Carretero A, Micol V, García F, Duarte J, Rodríguez-Cabezas ME, Gálvez J. The prebiotic

properties of Hibiscus sabdariffa extract contribute to the beneficial effects in diet-induced obesity in mice. *Food Res Int.* 2020 Jan;127:108722.

11. Todorov H KB, Bayer F, Brandão I, Mann A, Mohr J, Pontarollo G, Formes H, Stauber R, Kittner JM, Endres K, Watzer B, Nockher WA, Sommer F, Gerber S, Reinhardt C. . α-Linolenic Acid-Rich Diet Influences Microbiota Composition and Villus Morphology of the Mouse Small Intestine. *Nutrients.* 2020 Mar 11;12(3):732.

12. Gao X CS, Liu S, Peng L, Xie J, Dong W, Tian Y, Sheng J. Correlations between α-Linolenic Acid-Improved Multitissue Homeostasis and Gut Microbiota in Mice Fed a High-Fat Diet. *mSystems.* 2020 Nov 3;5(6):e00391-00320.

13. Jarosz L MA, Gradzki Z, Kwiecien M, Zylinska B, Kaczmarek B. Effect of feed supplementation with zinc glycine chelate and zinc sulfate on cytokine and immunoglobulin gene expression profiles in chicken intestinal tissue. . *Poult Sci.* 2017 Dec 1;96(12):4224-4235.

14. Lamberti LM WC, Chan KY, Jian WY, Black RE. Oral zinc supplementation for the treatment of acute diarrhea in children: a systematic review and meta-analysis. *Nutrients.* 2013 Nov 21;5(11):4715-4740.

15. Martins CF TP, Coelho DF, Correa F, Ribeiro DM, Alfaia CM, Pinho M, Pestana JM, Mourato MP, Almeida AM, Fontes CMGA, Freire JPB, Prates JAM. Influence of Chlorella vulgaris on growth, digestibility and gut morphology and microbiota of weaned piglet. *Sci Rep.* 2022 Apr 9;12(1):6012.

16. Bedirli A KM, Ofluoglu E, Salman B, Katircioglu H, Bedirli N, Yilmazer D, Alper M, Pasaoglu H. Administration of Chlorella sp. microalgae reduces endotoxemia, intestinal oxidative stress and bacterial translocation in experimental biliary obstruction. *Clin Nutr.* 2009 Dec;28(6):674-678.

17. Valcheva R HN, Gillevet P, Sikaroodi M, Thiessen A, Madsen KL. . Soluble Dextrin Fibers Alter the Intestinal Microbiota and Reduce Proinflammatory Cytokine Secretion in Male IL-10-Deficient Mice. . *J Nutr.* 2015 Sep;145(9):2060-2066.

18. Dou Y YX, Luo Y, Chen B, Ma D, Zhu J. Effect of Fructooligosaccharides Supplementation on the Gut Microbiota in Human: A Systematic Review and Meta-Analysis. *Nutrients.* 2022 Aug 12;14(16):3298.

19. Lee PC HY, Huo TI, Yang UC, Lin CH, Li CP, Huang YH, Hou MC, Lin HC, Lee KC. . Active Vitamin D3 Treatment Attenuated Bacterial Translocation via Improving Intestinal Barriers in Cirrhotic Rats. *Mol Nutr Food Res.* 2021 Feb;65(3):e2000937.