

# The Effects of Synbiotic Supplementation on Constipation and Reducing Flatulence in Stroke Patients Admitted to the ICU

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## Abstract

**Background:** Stroke is the world's first cardiovascular disorders. The stroke patients are at risk of gastrointestinal problems such as constipation and flatulence that cause complications include increased intracranial pressure and reduce capacity respiratory in these patients. This study aimed to evaluate the effects of synbiotic supplementation on stroke patients admitted to ICU with constipation and flatulence.

**Methods:** This study is a randomized two groups clinical trial on 65 stroke patients admitted to the ICU Taleghani hospital in Mashhad for simple random sampling available was performed. Patients were randomly divided into two groups: intervention group (n=33) and control group (n=32) and the number of bowel movements and abdominal circumference were measured before the study. Patients in the intervention group, in addition to usual care, for one week; every 12 hours; received synbiotic supplement and the control group only received conventional treatment. In the end; the frequency of bowel movements and abdominal circumference of all the patients; were again check. Data by using; Poisson regression data correlated model and analysis of covariance, using SAS version 9.1 and SPSS version 11.5; at 95% confidence level; was analyzed. Results were compared between the two groups.

**Results:** In the Intervention group the average number of bowel movements 1.22 and in the control group was 0.62 ( $p<0.0001$ ). Also measured waist size in both intervention and control groups showed that abdominal circumference on average in the intervention group than the control group decreased by 1.6 cm and this change was significant ( $p=0.028$ ).

**Conclusion:** This study showed that synbiotic supplementation consumption increased bowel movements and reduce abdominal circumference in patients with stroke. Therefore, probiotics can be used as a non-drug treatment in patients with constipation and abdominal bloating.

**Keywords:** Probiotics; Constipation; Flatulence; Stroke; ICU

## Introduction

Stroke is a syndrome with acute onset of neurologic deficit lasting more than 24 hours, determined and resulting from the injury central nervous system as a result of impaired in cerebral blood flow [1]. The annual incidence of stroke for the first time in Iran, 139 people per hundred thousand, that these statistics are significantly higher than most western countries. Stroke patients are at risk of several side effects, that one of them is constipation [2]. This illness is formatting problems gastrointestinal after the stroke, that it's prevalence in these patients is 30% to 60% [3]. Constipation can cause increased intracranial pressure and impaired rehabilitation treatment due to difficulties in controlling bowel movements [4-6]. Increased intracranial pressure can cause brain herniation, hydrocephalus, vasospasm or cerebral edema [4]. Other problems in patients with stroke admitted to ICU and receive nutrition through a nasal tube is abdominal bloating, so that in patients admitted to intensive care units, what fed in this way, despite its many benefit, has side effects such as diarrhea, vomiting, distension, dumping syndrome, constipation and also the aspiration [7,8]. Gas accumulation due to flatulence causes dilation and strain abdominal, so that the diaphragm is pressed upward and the expansion of the lungs reduces and thus the person suffers from shortness of breath [9]. However, in these patients to improve blood supply to brain tissue, respiratory status of the patient should be carefully monitored, because decrease of oxygen in areas of the brain that ability of out regulation is impaired, increases the risk of stroke and the enough blood and oxygen supply to the brain, brain hypoxia to minimum [10]. During constipation and bloating the balance of microflora in the bowel change [11,12]. Intestinal helpful bacteria such as probiotics through the growth and its activity inhibit

the growth and proliferation of the Harmful bacteria and in addition to the synthesis of essential substances such as vitamins and amino acids play an important role in maintaining health. The use of probiotics has beneficial effects on digestive health patients. Probiotics can increase bowel movements or decrease bowel transit time of food, through the digestive tract to help treat constipation [13,14]. In a study on patients suffering from constipation, it was observed that adults consume *Bifidobacterium lactis*, *Lactobacillus Casei* and *Escherichia coli* have a favorable effect on the frequency of defecation and the stool consistency [13]. Probiotics also reduce bloating, abdominal swelling and gas due to inhibitory effects on the disinfectant intestinal bacteria [15]. Several probiotics have long and short-term effects in reducing flatulence. So that probiotics containing *Lactobacillus* and *Bifidobacterium* species was effective to reduce flatulence in 50% of patients within four weeks compared with placebo [16]. Given the high prevalence of digestive problems such as constipation among patients with stroke and its complications also the lack of such research in the study population and lack of side effects during treatment with probiotics, this study

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aimed to investigate the effects of a synbiotic supplementation on stroke patients with constipation and bloating to possibly achieve a positive result probiotics can be used as a non-drug uncomplicated treatment in the treatment of constipation and flatulence in patients with stroke admitted to ICU.

## Materials and Methods

Study was a randomized clinical trial and was approved by the ethics committee of Sabzevar University of Medical Sciences. The study population were stroke patients admitted to the ICU Taleghani Hospital Mashhad in 1393. Sample size at 95% confidence level and 80% power and by taking measure twice, 50 people were determined by calculating the percentage for loss patients, increased to 70 patients. Finally five peoples refusing to continue treatment with synbiotic supplementation and medical diagnostics to change the type and dose of laxative intake were excluded and 65 patients completed the study. Who entered the study which had no excretion three consecutive days and their GCS was 5 to 15. The patients without comorbidities have been caused by constipation and the constipation-inducing drugs were not used and their nutrition was through a nasogastric tube. As well as the amount of gavage type and dose of laxative intake activities and hydration status were in the same conditions with other patients, who did not tolerate gavage and had systolic blood pressure less than 100 mm Hg were excluded from the study. At first the purpose and method of the study was explained to the man consent of written of the patients or their parents were received. At baseline, frequency of bowel movements and abdominal circumference of all patients company eligible in this study were measured and recorded. Then patients based on simple random allocation method divided into two intervention and control groups. The intervention group in addition to the equal treatment prescribed (MOM=15 cc). Daily, two numbers symbiotic supplement Zist Takhmir company contains seven strains of bacteria (*lactobacilli*, *bifido bacteria*, and *Streptococcus thermophilus*) and Fructo seoligo saccharide probiotic severy 12 hours, after the meal received and the control group only continued their usual treatment (MOM=15 cc). After the start of the study defecation in both groups for a week and abdominal circumference patients at the end of a week of study were measured again. During the intervention, the patients for one week in terms of side effects were observed. Analysis of the data was performed using SPSS version 11.5 and SAS version 9.1. Initially, descriptive indicators and then using the data correlated Poisson regression model and analysis of covariance, response to treatment was compared at a significance level 0.05.

## Results

Research was done on 33 men and 32 women, with an average age of  $60.52 \pm 13.127$  in the intervention group and the  $62.41 \pm 14.659$  in control group. Statistical analysis of patients in the two groups for age, sex and other demographic variables such as occupation, education and place of residence showed that patients in these variables between the two groups were uniformly distributed ( $p > 0.05$ ). Comparing the number of daily bowel movement between the two groups showed that the average number of daily bowel movements in the intervention group (1.22) and in the control group (0.62) was obtained (Table 1). The difference observed between the two groups is significant at 95% confidence level ( $P < 0.0001$ ).

Also comparison of abdominal circumference between the two groups showed that synbiotic supplementation could have a significant reduce abdominal circumference on average more than 1.6 cm compared to the control group (Table 2). No side effects were reported in patient that treatment with synbiotic.

Parameter	Estimated	Standard Erro	Confidence interval	Z	P
Constant factor	0.8805	0.3941	0.1081 1.6529	2.23	0.0255
Factor Group	-0.815	0.0858	-0.8498 -0.5133	-7.94	<0.0001

Table 1: Estimated coefficients poisson regression data correlated model with GEE method.

Predictor variables	Factor	standard error	p-value
Measurement abdominal circumference before intervention	0.996	0.23	0.0001
group	1.609	0.702	0.028

Table 2: Estimated regression coefficients in the model analysis of covariance.

## Discussion and Conclusion

Constipation known as a serious problem in clinical practice and 60% of patients in the rehabilitation of stroke affect [5]. Constipation after stroke is due to inactivity, inadequate intake of water or food, depression, lack of appropriate activities, cognitive impairment, loss of consciousness and drugs consumables [17]. Also the stroke patients admitted to intensive care units and under nasal gastric tube feed has digestive problems such as delayed emptying of the stomach, distension, flatulence and constipation that with adverse outcomes such as reduced respiratory capacity and hypoxic brain in these patients is associated. Other causes of abdominal bloating include: eating large, quick meals and pain medication that reduce speed and pass gas and retention [18]. Despite the reports on the impact of probiotics on constipation and bloating and the adverse effects of chemical drugs and the lack of a comprehensive agreement on the treatment of flatulence so far. Clinical study on the effect of probiotics on constipation and bloating stroke patients and treated through the nasogastric tube not been done. Therefore, in this study was tried to determine the effect of symbiotic supplement on constipation and bloating stroke patients admitted to ICU. In this study, consumption of synbiotic supplementation increased the frequency of bowel movements in the intervention group compared to the control group. So that the average number of bowel movements in the intervention group more than once a day respectively (1.22) compared with the control group this amount was on average every two days (0.62). Also in this study consumption of probiotic supplementation in the intervention group decreased an average of 1.6 cm abdominal circumference than the control group that's mean the intervention has been effective in this study. In a study of Drama et al. with title "bacterial cell combined effect in improving chronic constipation" did, it was found that consumption composition of the microbial cell containing fructose oligosaccharide, *Bifidobacterium* and *Lactobacillus* in 7 days is effective in improving the frequency of stools and symptoms of chronic constipation ( $p = 0.001$ ) [19]. Also another research by Young Yuksyn et al. with title "effect of the use of fermented milk containing *Bifidobacterium lactis* on constipation in women" was done. In this study it was found that the use of fermented milk containing the bacterium lactis and yogurt stiff increase significantly the number of bowel movements after one week ( $3.5 \pm 1.5$  vs  $2.4 \pm 6.0$ ,  $P < 0.01$ ) and at the end of two weeks ( $4.1 \pm 1.7$  vs  $2.4 \pm 0.6$ ,  $P < 0.01$ ). These effects are regarding to increased bowel movements or decreased bowel transit time of food through the digestive tract. These results of this study showed that probiotic supplementation in stroke patients admitted to the ICU increased frequency of bowel movements and constipation, and could possibly improve complications of constipation in these patients [20]. In research by Kalman et al. with title "assessment effect

of *Bacillus Coagulate* on functional intestinal gas symptoms” carried out it was found that consumption of products containing *Bacillus Coagulan* reduce gastrointestinal symptoms associated gases of meals, especially abdominal pain and distention after a meal linked ( $p=0.046$ ) [21]. Overall the results of this study showed that consumption of symbiotic supplement in stroke patients admitted to the ICU increased frequency of bowel movements and constipation and could possibly improve discomfort caused by abdominal bloating in these patients. Due to the positive effect of probiotics in the treatment of digestive problems such as constipation and bloating in patients with stroke can be evaluate the effect of probiotics in the treatment of other gastrointestinal problems such as diarrhea in stroke patients or in other patients with similar conditions note.

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