Supportive-Educative Nutrition Increases Family Support, Adequate Nutrition, and Decrease Diabetic Gastroparesis

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Abstract: Chronic complications are common in the gastrointestinal tract of diabetes mellitus patients called diabetic gastroparesis. Supportive-educative nutrition will help patients and families to achieve adaptive behavior and nutrition self-sufficiency. The purpose of this study was to analyze the influence of supportive-educative nutrition on family support, nutritional intake, and decreased gastroparesis of patients with diabetes mellitus. This study used quasi experimental, with pre-posttest design. The sample of 24 patients and the patient's family was taken by purposive sampling technique. Independent variable was supportive-educative nutrition and dependent variables were family support, nutritional intake, clinical sign of gastroparesis, and blood glucose levels. Family support data, nutritional intake, clinical sign of gastroparesis were measured by questionnaire and blood glucose levels by intake of venous blood samples. The inferential analysis used was Wilcoxon Signed Rank, Mann-Whitney U test, paired T-test, Independent T-test with significant level α=0.05. The result showed that there were significant differences in family support ($p = 0.005$), nutritional intake ($p = 0.015$), and clinical sign of gastroparesis ($p = 0.000$). There was no difference in post-prandial blood glucose levels ($p = 0.229$). Supportive-educative nutrition of diabetic gastroparesis can improve the knowledge and acceptance of patients and families about the patient's condition so that family support will increase and achieve adequate nutritional intake and decreased clinical sign of gastroparesis.

1 BACKGROUND

The number of Diabetes Mellitus sufferers worldwide and in Indonesia is increasing year by year, the incidence of complications of the disease also increases. Complications of DM disease of all organs of the body and cause various complaints (Ernawati, Suharto and Dewi, 2015). Diabetic patients have diabetic gastroparesis after > five years of onset and prevalence of diabetic gastroparesis or dyspepsia occurring around 33.7% in DM patients (Sfarti et al., 2010). Symptoms of diabetic gastroparesis include: full satiety, after eating full stomach, nausea, vomiting, abdominal pain and abdominal distension. Patients with diabetic gastroparesis experience symptoms as they eat, resulting in inadequate oral intake and patients experiencing calorie deficiency, some vitamins and minerals (Koch and Calles-Escandón, 2015).

Supportive-educative is a nursing assistance system that is given to patients with chronic diseases and families who need support and education in the hope that patients and families are able to do the treatment independently (Tomey and Alligood, 2014). Supportive-educative nutrition to patients and families becomes very important in the management of DM disease because it helps increase the participation of families in an effort to improve the management of DM disease. Management of diabetic gastroparesis patients with pharmacological therapy has not given optimal results. Supportive-educative nursing actions in diabetic gastroparesis patients and families on nutritional intake in diabetic gastroparesis patients will help patients and families achieve adaptive behavior and self-sufficiency in nutrition fulfillment. Recommended diet modification based on an understanding of the physiology of gastric emptying of food according to the physical state and nutritional classification.

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Research purposes was to analyzed the effects of supportive- educative nutritional support to family support, nutritional intake, decreased gastroparesis, and measure blood glucose level in patients with diabetes mellitus.

2 METHODS

2.1 Study Design

Type and design of this research using Quasi Experiment, with pre-posttest design. The study was conducted at the Hospital in Gresik on April, 11st to May, 30th 2014.

2.2 Study Population, Sampling, Variables

The affordable populations in this study were all patients with Type 1 and Type 2 DM who had dyspepsia and came to internal medicine. The sampling process using purposive sampling technique. Samples were taken based on the patient's inclusion criteria: age 30-60 years, DM 5 years or more, received the same hypoglycemic treatment: oral/ insulin/ combination or the same gastrointestinal medication. Family inclusion criteria: age 25-60 years old, living at home with patients and more intensively caring for patients, able to read and write. Sample size in each group was 12 patients and family.

Independent variable in this research was supportive-educative nutrition using booklet combination with guidance and teaching. Dependent variables include: family support, patient behavior in nutritional intake, clinical symptoms and blood glucose levels 2 hours pp series diabetic gastroparesis patients.

2.3 Measure

The instrument of data collection using observation sheet of Diabetes Social Support Questionnaire-Family, Block Food Frequency Questionnaire, Gastroparesis Cardinal Symptom Index, and examination of blood glucose level 2 hours pp in cooperation with the Laboratory Hospital in Gresik.

2.4 Intervention

The patient's initial procedure measured family support, last week's nutritional intake, clinical sign diabetic gastroparesis, and 1st blood glucose level. Then, the patient treatment group was given supportive-educative nutrition for 4 times (every meeting 30-60 minutes) in 4 weeks, before starting the patient's action checked blood glucose 2nd, 3rd, 4th. The control group performed conventional intervention in accordance with the Standard Operating Procedures (SPO) of the hospital. The final stage of patient and family is reassessed family support, last week's nutritional intake, clinical picture, and 5th blood glucose level.

2.5 Data Analysis

The collected data were analyzed descriptively and analytically by Wilcoxon Signed Rank Test, Mann-Whitney U test, Paired T-Test, Independent T-Test, ANOVA Same Subject and ANOVA Interaction 2 Factor with significance level α=0.05.

2.6 Ethical Clearance

Ethical permission was obtained from the Ethical approval No: 75-KEPK, April 7th 2014 from the Ethics Committee of the Faculty of Public Health Universitas Airlangga. At the beginning of this study, participants fulfilled informed consent and demographic data. The researchers keep secret data of each participants by using code.

3 RESULTS

Participants between treatment group and control group had a similar characteristic in gender, age, and length suffer of DM, which is most of the patients

Table 1: Characteristic of Patients Diabetic Gastroparesis

Variable	Treatment Group		Control Group	
	n	%	n	%
Gender				
Male	2	16.6	3	25
Female	10	83.4	9	75
Age (M ± SD)	51.58 ± 5.9		52.42 ± 3.6	
Education				
Elementary	3	25	-	-
Junior	3	25	1	8.3
Senior	3	25	11	91.7
Higher Ed.	3	25	-	-
Length of DM				
5-10 years	9	75	11	91.7
11-15 years	2	16.7	1	8.3
16-20 years	1	8.3	-	-

were female and length of DM 5-10 years. The average age treatment group was 51.58 years old, as much as 75% patients had a length of DM 5-10 years (Table 1). Characteristic of patients in control group shows that the average age was 52.42 years old, as much as 91.7% patients had a length of DM 5-10 years.

The results of data collection were obtained in the treatment group from the total of 12 participants before the supportive-educative action of low family support nutrition as much as 9 people (75%) and high family support of 3 people (25%). After high family support action as many as 10 people (83.33%) and low family support as much as 2 people (16.67%). In the control group of total participants 12 people before the action of low family support nutrition counseling as much as 9 people (75%) and high family support as much as 3 people (25%). After given supportive-educative nutrition, high family support as much as 8 people (66.67%) and low family support counted 4 person (33.33%).

Wilcoxon Test Signed Rank Test got p value = 0.005. The p <0.05 results mean that there is a supportive-educative effect of nutrition on family support in DM patients with gastroparesis. While Mann-Whitney test obtained p value = 0.106. The p> 0.05 results mean that there is no difference in family support between the treatment group and the control group.

Data of nutrient intake in treatment group from total of 12 participants before supportive-educative action of nutrition of nutritional intake of patient was nutritional deficiency as much as 5 people (41.67%), nutrition more than 3 people (25%) and nutrition fulfilled as many as 4 people (33.33%). After given supportive-educative, nutrition intake of patient is enough nutrition as many as 10 people (83.33%) and nutrition more as much as 2 person (16.67%). In the control group of total participants 12 people before nutritional counseling treatment of nutritional intake of patients was nutritional deficiency as much as 5 people (41.67%), more nutrition as many as 3 people (25%), nutrient fulfilled by 4 people (33.33%). After standard procedure from hospital, nutrition intake of patient is enough nutrition as many as 11 people (91.67%) and more nutrition as much as 1 person (8.33%).

Wilcoxon Test Signed Rank Test got p value = 0.015. Result p count <0.05 meaning that there is influence of supportive-educative nutrition to nutrition intake of DM patient with gastroparesis. While Mann-Whitney test obtained p value = 0.001 count. The p <0.05 results mean that there is a significant difference in the patient's nutritional intake between the treatment group and the control group.

Clinical overview data on treatment group of total participant 12 people before supportive-educative nutrition of participant experience clinical sign gastroparesis very severe as much as 1 person (8.33%), severe clinical sign of gastroparesis counted 4 person (33.33%), medium clinical sign as many as 3 people (25%), mild clinical sign as much as 1 person (8.33%), and very light clinical sign of 3 people (25%). After given supportive-educative nutrition, most of participant feel clinical sign gastroparesis very light as much as 7 people (58.3%). In the control group of total participants 12 persons before the participant's nutritional counseling experience clinical sign of gastroparesis very severe as much as 2 people (16.7%), severe clinical sign counted 6 people (50%), medium clinical sign as many as 3 people (25%), and very light clinical sign of 1 person (8.33%). After the action, most of the clinical experience gastroparesis very light as much as 7 people (58.3%).

Paired T-Test test obtained p value = 0,000. Results p <0.05 which means that there is influence support-educative nutrition to the clinical sign of DM patients with gastroparesis. While the independent test T-Test obtained p value = 0.994. The p> 0.05 results mean that there is no difference in the clinical sign of the patient between the treatment group and the control group. Most of the participants in the treatment group showed an abnormal 2 hour pp blood glucose test of 200 mg / dL can be seen picture below.

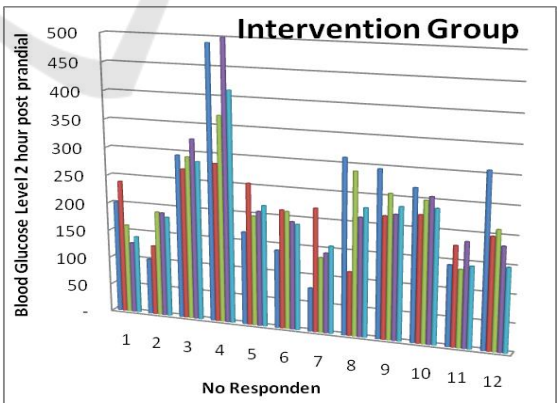

Figure 1: Blood Glucose Test 2 hour pp series(1-5) on intervention group.

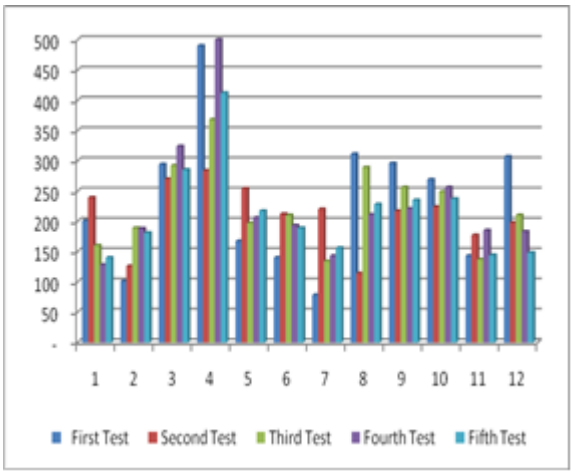

Figure 2: Blood Glucose Test 2 hour pp series on control group.

ANOVA Same Subject test obtained p value = 0.229. Results p> 0.05 which means that there is no influence supportive-educative nutrition to blood glucose patient examination DM with gastroparesis. While the test ANOVA Interaction Two Factors obtained p value = 0.772. Results p> 0.05 which means that there is no significant difference in blood glucose levels of DM patients with gastroparesis between the treatment group and the control group.

4 DISCUSSION

Family support is verbal information, real assistance or behavior provided by the family with the subject in his or her social environment or in the form of attendance and things that can provide an emotional advantage or influence on the behavior of the recipient. People who get emotional support feel relieved to be noticed, get advice or a pleasant impression on him (Almutairi, 2015). Most participants experienced increased family support from low support to high support. There were 2 participants of the treatment group families who did not experience a significant increase in family support after the supportive-educative nutritional action was performed because 2 intensive families treated the patients to work in the civil service, rarely at home and provide support and attention to DM patients with gastroparesis. Factors that affect family support one of them is intimacy. The more intimate a person then the support obtained will be greater. The family is the main group that has the greatest emotional bond and the closest to the sufferer, any grievances that are felt are usually expressed on family members. Besides, families relieve the burden of suffering during illness.

The results showed that most participants experienced calorie deficiency before giving supportive-educative nutrition. It says deficiency when <60% of nutrient intake is needed (Keld and Lal, 2014). The results of this study in line with research in America showed that many patients with DM gastroparesis deficiency energy, vitamins and minerals by 194 patients from 305 patients. Caloric deficiency of DM patients by <60% of estimated total calorie requirement and deficiency of vitamin C, D, E, K, folate, calcium, iron, magnesium and potassium (Parkman, 2015). However, the study participants showed no deficiency of certain vitamins and minerals because most participants received vitamin and mineral supplements to provide less intake.

The results also showed 2 treatment group participants with more nutritional intake. Patients with chronic disease are sometimes saturated and bored with existing dietary rules so that patients are not adherent in the management of DM disease. Giving supportive-educative nutrition in this study not only touches the physical aspect but also the psychological aspects so that patients are able to adapt and independently in meeting and controlling food intake.

DM patients with gastroparesis obtained data before the nutritional supportive-educative measures mostly had clinical sign of severe gastroparesis and after most of have clinical sign of gastroparesis were very light. Provision of nutritional supportive-educative approaches known as Guidance (Booklet) and Teaching by discussion method, where participants and families are given the freedom to express experience during illness, if any gaps are corrected and guided by researchers and discussions with patients and families to make decisions. This method provides an opportunity for patients and families to receive and respond to received guidance and instruction (Notoatmodjo, 2010). This method becomes very important because it emphasizes the involvement of patients and families directly and will more easily accept the various input given.

There were 1 treatment group participants who still experienced severe gastroparesis sign after providing supportive-educative nutrition. This is because the participant does not carry out any activity. This situation is in accordance with previous research which shows that patient perception can influence the success of action (Homko, Siraj and Parkman, 2016). Symptoms and signs of gastroparesis in DM patients due to slowing

of emptying of the stomach without any organic obstruction either in the stomach or small intestine proximal part (Camiller et al., 2013). Light activity such as walking casually half an hour after eating will help empty the food in the stomach because the food is quickly digested (Hasler, 2011).

Treatment group and control group participants used gastrointestinal drugs. Symptoms associated with gastroparesis in DM patients can be treated using prokinetic drugs such as: metoclopramide, cisapride and domperidone. These drugs can penetrate the blood brain barrier causing side effects drowsiness, anxiety, anxiety and fatigue. There is an effect of gastrointestinal drug use on the decrease in clinical sign of gastroparesis in DM patients. The use of prokinetic drugs is not recommended in the long term because it will lead to Parkinson's syndrome and can occur seizures (Camilleri, Bharucha and Farrugia, 2011). Between treatment and control group also used same medication for hipoglikemik and gastrointestinal drug, however intervention group have more decrease in clinical sign of gastroparesis than control group.

Most of the participants in the treatment group showed an abnormal 2 hour blood glucose level that is ≥200 mg/ dL. Adaptive behavior of individuals and families, can not change the condition of recombinant organ or cell DM patients that have been damaged. This is in accordance with previous research which states that the effects of gastroparesis can damage the absorption of drugs so that blood glucose levels become difficult to control (Oh and Pasricha, 2013).

This study used diabetic gastroparesis patients with the use of DM drugs and varying doses; oral, insulin or a combination of oral-insulin. Incoming foods will be absorbed in the small intestine that activates insulin and glucagon. Insulin will cause increased glycogenesis and inhibit glycogenolysis (Guyton and Hall, 2014). Glucagon increases glycogenesis by activating adenyl cyclase and increasing intracellular cyclic adenosine monophosphate (cAMP) in the liver. This will activate phosphorylase through protein kinase resulting in the breakdown of glycogen. With glucagon then gluconeogenesis will also increase so that the patient's blood glucose level is controlled (Guyton and Hall, 2014).

The study participants who showed normal blood glucose levels were some of the treatment group participants and the control group who used combination therapy of oral hypoglycemic drugs and insulin. But the control group, although most use oral hypoglycemic drugs can normalize blood glucose levels. This is because most of the control group participants with less duration of DM sickness than the treatment group. Long suffer of DM demonstrates the longer duration of DM disease that is felt, the patient will feel bored and bored to control the disease and obey the rules of the existing diet. In addition to long-term DM pain associated with damage to organs that produce insulin or cell receptors (Camiller et al., 2013).

5 CONCLUSIONS

Supportive-educative nutrition can improve understanding and acceptance of the family about the patient's condition, related to increase family support for the patient and changes in adaptive nutritional intake behavior and decreased clinical picture of gastroparesis. However, there was no effect of supportive-educative nutrition on blood glucose levels of 2 hp pp series of DM patients with gastroparesis. The patient's blood glucose levels still show abnormal blood glucose levels. Subsequent studies may use gastric or endoscopic scintigraphic diagnostic tests to confirm diabetic gastroparesis.

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