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Case Report

Nutritional Therapy in High Output Enterocutaneus Fistula with Ileum Adhesion Grade III-IV : A Case Report

Rima January [1], Agussalim Bukhari [2], Nurbaya Syam [2], Nurpudji A. Taslim[2], Suryani As'ad [2], Haerani Rasyid [2], Yasmin Syauki [2]

[1] *Nutritional Department, Medical Faculty of Universitas Muhammadiyah Makassar, Indonesia*
[2] *Nutritional Department, Medical Faculty of Hasanuddin University, Makassar, Indonesia*

Corresponding Author:
Name : Rima January
Email : rimajanuary5188@gmail.com

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ABSTRACT

Introduction and importance: *Enterocutaneus fistula (ECF) is an uncommon connection between the gastrointestinal tract and the skin. Loss of intestinal fluid in ECF patients results in an imbalance of electrolytes. The objectives of nutritional therapy were to fulfill nutrient needs, maintain fluid balance, & promote ECF closure.* ***Presentation of case:*** *A 22-year-old male, was diagnosed with post-adhesiolysis and end colostomy surgery. His oral intake was reduced for one month, and he experienced weight loss. We detected a loss of subcutaneous fat and fistula in the right abdomen region and wasted time on physical examination. Abnormal laboratory findings were leucocytosis, thrombocytosis, imbalance electrolyte, and hypoalbuminemia.* ***Discussion:*** *Nutritional assessment was based on mid-upper arm circumference. Nutritional treatment was provided with a calorie target of 2300 kcal and protein 2g/kg ideal body weight (IBW)/day. On the seventh day of treatment, the patient went through relaparotomy due to high output ECF (2000 ml/d) and ileum adhesion grade 3-4. Following surgery, the patient was on parenteral nutrition for eighteen days. Due to high ECF output, protein intake was increased by 2g/kg IBW/day, and fluid intake was adjusted based on fistula*

output. The patient received a combination of polymeric formula and whey protein by oral intake and micronutrient supplementation at twice the usual dosage. By the 27th day of treatment, ECF output had decreased to 0 ml/d, and laboratory results showed improvement. ***Conclusions:*** *Adequate nutrition, fluid, and electrolyte balance through optimal nutritional therapy can improve laboratory values and reduce ECF output in ECF patients.*

1. INTRODUCTION

Enterocutaneous fistula (ECF) refers to a condition where there is an abnormal connection between the intestinal lumen and the skin. About 30% of ECF appears spontaneously in malignancy, radiation, sepsis, or inflammatory bowel disease. However, more than 75% of ECF occurs due to postoperative complications such as enterotomy that cannot be cured or is caused by anastomosis [1]. It produces lots of fluids, electrolytes, minerals, and proteins that contribute to complications such as dehydration, electrolyte imbalance, and malnutrition [2, 3]. ECF classification based on output volume characteristics: Low output expected as <200cc / day, moderate output as 200-500cc / day, and high output as> 500cc / day. Optimal nutrition in ECF patients is one of the most essential things in their care. Fazio et al. showed mortality in ECF 0.5% of patients with serum albumin compilation> 3.5 mg / dL. The fistula closure rate is twice as fast in those who receive optimal nutrition as those who do not. Successful nutritional management on ECF aims to enhance weight and anabolic levels, increased albumin, and adequate micronutrient requirements for optimal recovery [4].

2. CASE PRESENTATION

A male, 22 years old, was consulted for nutrition management with a diagnosis of post-op day 7 exploration laparotomy adhesiolysis, and repair of the abdomen wall. Three years ago, the patient had a motorbike accident and was diagnosed with obstruction of Ileus due to blunt abdominal trauma; anastomotic resection surgery was performed in Palu Hospital; patients were treated for 3 months, then herbal treatment patients. Two weeks before being admitted to the hospital at this time, the patient was admitted to Pelamonia Hospital because he complained of an operation on the abdomen lump 3 years ago, a lump in the stomach the size of a quail egg, then broke out the contents of the food and blood. Then, laparotomy surgery was performed for the exploration of adhesiolysis and ileostomy. On August 4, 2018, the patient was referred to Wahidin Sudirohusodo Hospital for further treatment of open abdominal surgery.

At the time of consultation, the patient's intake had decreased for the past month, weighing the last four days because the appetite decreased due to postoperative suture pain. Nausea and vomiting did not exist. A history of vomiting lasted one month after an operation at Pelamonia Hospital. There is no fever and no history of fever. A weight loss history existed for the past month, but the magnitude is unknown.

Physical examination results showed conjunctival anemias, loss of subcutaneous fat was present, the abdomen was concave, and there was a stoma colostomy in the right abdomen, verband closed post-op injury. Wasting is found in superior and inferior extremities. Edema does not exist. Laboratory examination found anemia, leukocytosis, thrombocytosis, and hypoalbuminemia.

Nutritional management is carried out by providing 2300 kcal of energy, protein of 2 g / BW / day, carbohydrate 50% of total energy, and fat in the form of medium chain triglycerides (MCT) 11. To ensure adequate intake, nutrients are given in oral and parenteral forms. On the sixth day of treatment, the patient underwent enterocutaneous fistula repair and colostomy repair. Parenteral nutrition is given after surgery; oral nutrition begins on the fourth day post-op repair in the form of formula milk, then slowly increases its composition to the tolerance of the optimal digestive tract in the form of soft food, semi-elemental formula whey protein, egg white, and MCT. Micronutrient therapy was given 2x AKG, vitamin C 1000 mg / 24 hours, vitamin A 6,000 IU / 12 hours, vitamin B complex two tablets / 8 hours, Zinc 20 mg / 24 hours, Curcuma 400 mg / 8 hours and cork fish extract two capsules / 8 hours.

3. DISCUSSION

The energy requirements for these patients are based on the Harris-Benedict formula with 1,2 activity factors and 1,4 stress factors obtained with a total energy requirement of 2000 kcal, then raised to 2300 kcal. Patients with ECF will need 1 - 2.5 times basal energy from healthy adults. A historic publication in 1964 reported a significant difference in survival with the ECF in the setting of adequate nutritional support. Patients who consume at least 1,500 kcal / day have a mortality rate 3.6 times lower than those with a calorie intake of less than 1,500 kcal / day[5].

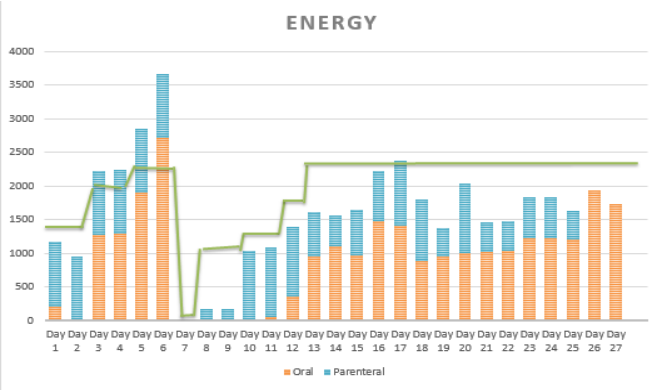

Fig. 1. The range of energy intake of ECF Patients during the treatment

The macronutrient composition given includes the amount of protein 1.5-2 gr / BW / day considering the existence of hypoalbuminemia, because 75 g of protein can be lost from enteric secretion every day[4]. Carbohydrates given are 287.5 grams (50%) and fat is around 76 grams (30%) of total energy requirements[9,10].

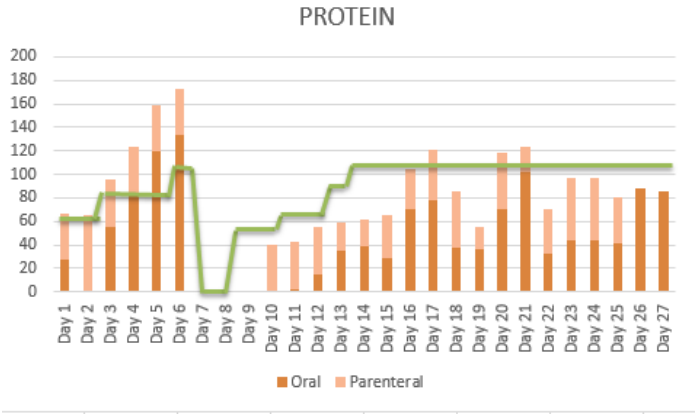

Fig. 2. The range of protein intake of ECF Patients during the treatment

The nutritional status of these patients was evaluated using anthropometric parameters of the mid-upper Arm Circumference (MUAC). The MUAC of these patients at the time of consultation was 16 cm, so based on the percentage of MUAC (MOH, 1994), patients were included in the category of malnutrition (54.6%). The patient's MUAC was 18 cm, then increased to 18.2 cm at the end of treatment on day 27.

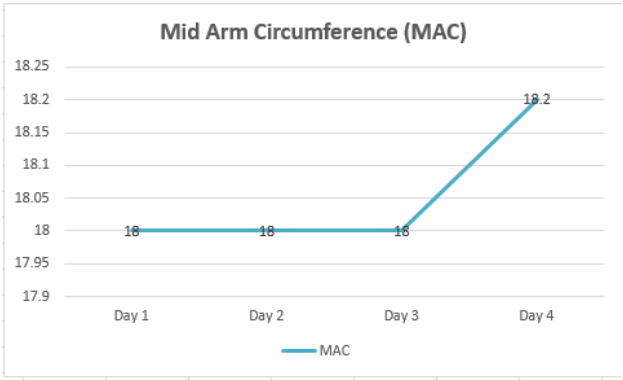

Fig. 3. Mid Upper Arm Circumference (MUAC) measurement results of ECF patient during the treatment

Hypoalbuminemia

Serum albumin levels are one of the determinants of successful wound healing. Albumin levels also determine the morbidity and mortality of ECF patients. When patients enter the hospital, albumin levels are 3.2 g / dl, then drop to 2.3 g / dl after surgery for relaparotomy. This occurs because the loss of albumin due to the rate of albumin synthesis and turnover increases due to the inflammatory process and the fluid that comes out of the enterocutaneous fistula. Albumin synthesis decreases by about 50% after 24-hour fasting, mainly due to reduced protein intake. Therefore, the body will use visceral proteins to meet energy needs, resulting in hypoalbuminemia. Based on the patient's albumin level, which is low (<3.5 mg / dL), the protein given is 2 gr / BW / day. This amount is fulfilled from oral and parenteral protein intake. Furthermore, additional supplements, namely cork fish extract capsules (Pujimin®), contain high-dose albumin so that the patient's albumin levels are seen to increase which tends to increase to 3.5 mg / dL at the end of treatment.

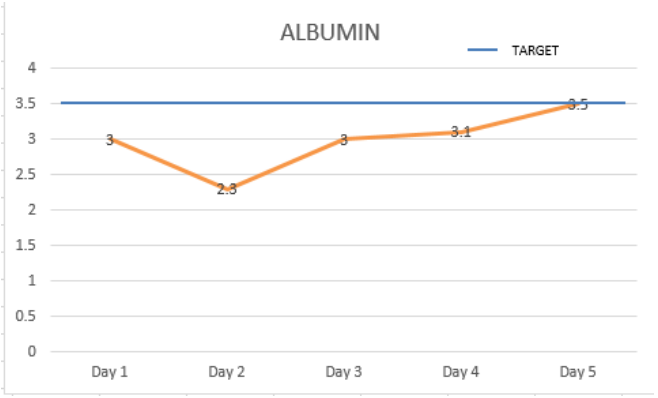

Fig. 4. Albumin level of ECF patients during the treatment

Fistula Output

At the time of conception, the production of the patient's enterocutaneous fistula volume ranges from 150cc / day; after relaparotomy surgery, fistula production gradually increases, then nutritional management is carried out by optimizing parenteral nutrition at first, then given polymeric formula, see its tolerance, see the tendency of output fistula still high, semi-elemental whey protein formula is given. If the fistula output increases significantly at the start of oral/enteral nutrition and leads to electrolyte disturbances, and if there are symptoms of intolerance if the output of the fistula is <1.5 L, it is recommended to try the Polymer Formula at first, and, if it is not tolerated or the fistula output increases significantly, semi-elemental formulas can be introduced. Semi-elemental nutrition has been shown to reduce the output volume of the fistula significantly, and whey protein contains all essential amino acids and is the highest quality protein among other proteins. Whey protein is also hydrolyzed more slowly in the intestine than other proteins.[5,7,8,12]

The mechanism action of a multifactorial semi-elemental diet. Reduction of digestive workload and absorption with semi-elemental formula diets and in peristalsis and digestive tract secretions play a role in reducing the amount of dirt residue, thereby reducing stoma output.[6,13,15]

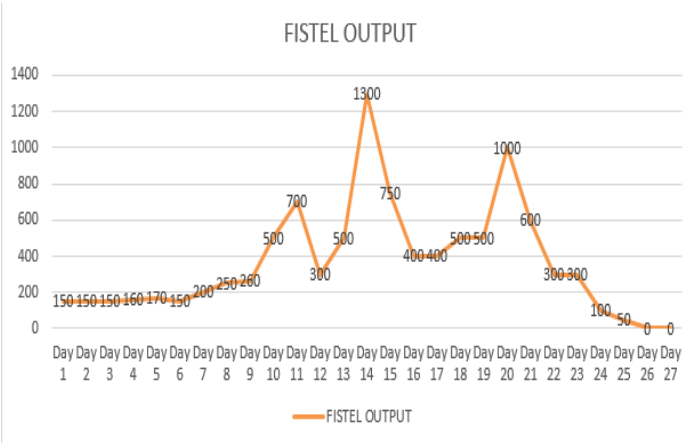

Fig. 5 Fistula output

Micronutrients

Optimal wound healing is highly dependent on adequate nutrition. Certain nutrient deficiencies can inhibit wound healing. Malnutrition is also associated with an increased incidence of infection and slowing wound healing. The adverse effects of nutrient

deficiency or malnutrition on wound healing occur because the inflammatory phase extends, decreases fibroblast proliferation, and inhibits collagen synthesis. In cases of high ECF output, more micronutrients are required, such as vitamin C with a usual 10x dosage and twice the normal dosage of vitamins and other elements. Micronutrient deficiencies in fistula enterocutaneous patients often occur due to increased needs and inadequate doses.

4. CONCLUSION

Patients with high-output enterocutaneous fistulas need special attention to optimal nutrition. Nutritional management of high-output ECF plays an important role in preventing patient morbidity and mortality. If nutritional requirements cannot be achieved orally or enterally or the output of the fistula is high, parenteral feeding should be used. Caloric needs are calculated based on Harris-Benedict, and nutritional status is calculated using MUAC, which is easy to do and inexpensive.

High protein is needed in patients with ECF to replace the amount of protein that comes out of the fistula. Selecting a type of semi-elemental formula whey protein can reduce fistula output because it is easily absorbed. Micronutrient nutrition therapy in high-output fistulas enterocutaneous requires a larger dose to accelerate the wound healing. The fistula closure rate is twice as fast as those who do not receive additional nutrients. The target of successful nutrition management is to achieve an anabolic state with weight gain, increased albumin, and successful management of the needs of micronutrients for optimal healing.

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Conflict of Interest Statement:

The author declares that the case report was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.