Journal of Local Therapy
Vol. 04, No. 02, 2025
p-ISSN: 2809-3240; e-ISSN: 2810-0875
pp: 51-60

A Case Study of Nutritional Care Process in Postoperative Uterine Myoma Patients with Anemia and Type 2 Diabetes Mellitus

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Abstract: *Uterine myoma is one of the benign tumors that is often found in reproductive-age women and often requires surgical intervention. Postoperative conditions become more complex when accompanied by comorbidities, iron deficiency anemia and type 2 diabetes mellitus (T2DM) which can slow recovery progression. The aim of this study is to describe the nutritional care process of patients after uterine myoma surgery with anemia and T2DM, including assessment, diagnosis, intervention, as well as monitoring and evaluation. The study design used an instrumental single-case study on a 43-year-old female patient who was hospitalized in the operating room for 4 days. Data were collected through anthropometric measurements (Mid Upper Arm Circumference/ MUAC and ulna length), biochemical analysis of medical records, daily 24-hour recall, Semi Quantitative Food Frequency Questionnaire (SQ-FFQ), and pre/post test. The results showed that patients experienced malnutrition based on MUAC (18.3 cm), severe anemia (Hb 7.9 g/dL), and hyperglycemia (blood glucose 284 mg/dL). Intake of energy, protein, fat, carbohydrates, fiber, and iron was classified as a severe deficit before the intervention. After feeding a high-protein DM diet with small and frequent portions, the average intake increased to 79.9% energy and 108.5% protein from the daily requirement. Nutrition education improves patient knowledge scores even though the changes are not significant. In conclusion, structured nutritional interventions are able to improve the nutritional adequacy of patients even though the improvement in nutritional status has not been significant in a short time.*

Keywords: uterine myoma, anemia, type 2 diabetes mellitus, nutritional care, case study

INTRODUCTION

Uterine myoma is one of the most common types of benign tumors found in reproductive-age women, with a prevalence ranging from 20–40% in women over 35 years of age (Hanriko et al., 2024). Myomas growth from the smooth muscle tissue of the uterine's wall and induce variety of symptoms, such as asymptomatic to pelvic pain, abnormal bleeding, infertility, or urinary disorders. In the most cases, uterine myoma requires medical intervention or surgery, especially when the tumor grows larger, causes heavy bleeding, or interferes with the function of surrounding organs. A surgical procedure that is often performed is myomectomy, or hysterectomy, which aims to remove myoma tissue to improve the patient's quality of life (Shiota et al., 2012).

Postoperative patients of uterine myoma face quite complex recovery challenges. The healing process is influenced by various factors, including nutritional status, the presence of comorbidities, and adherence to postoperative diet. Nutritional factors play a crucial role because the body needs macronutrients and micronutrients to accelerate wound healing, improve the immune system, and prevent the complications. General principles of the postoperative diet include feeding high protein to support tissue regeneration, sufficient fluids to prevent dehydration and constipation, and control of fat and sugar intake according to the patient's clinical conditions (Dashti & Mogensen, 2017). Thus, nutritional interventions must consider the specific needs of the patient so that the recovery process runs optimally.

The problem will be more complex when postoperative uterine myoma patients have comorbidities, such as type 2 diabetes mellitus (DM) and iron deficiency anemia. Diabetes mellitus, which is characterized by chronic hyperglycemia, can interfere the wound healing process through the decreased leukocyte function, impaired blood flow, and high oxidative stress (Brownlee, 2018). Meanwhile, iron deficiency anemia reduces the oxygenation capacity of tissues thereby slowing down cell regeneration and aggravating fatigue conditions in patients. The combination of these two conditions in postoperative patients increases the risk of complications, slows recovery, and decreases the patient's quality of life (Camaschella, 2019).

Based on laboratory data, patients with postoperative uterine myoma accompanied by anemia and T2DM often show the lowering hemoglobin level, decreased hematocrit, and high blood glucose levels. This condition indicates a nutritional and metabolic imbalance that requires special treatment. Inadequate oral intake due to pain, nausea, or decreased appetite further worsens the nutritional status of patients. Previous research has shown that patients with energy intake <80% of daily needs have a high risk of failing to achieve optimal recovery (Putera, 2019). Therefore, proper dietary strategies, including small frequent meals and soft textures, can help increase nutrient intake and prevent nutritional deficits (Leidy et al., 2009; Mutia & Rachmawati, 2020).

The study about nutritional care process in patients with this multi-comorbid condition is still relatively limited in Indonesia. The most previous studies have focused on just one condition, for example nutritional interventions in diabetic patients (Chew et al., 2021) or in patiens with anemia (WHO, 2020). However, the integration of nutritional management in postoperative myoma patients with multiple comorbidities is still rarely explored. In fact, this case is important to study because it illustrates the real challenges in the daily practice of clinical nutrition. Case studies can provide an in-depth representation of how nutritional interventions are adapted to the patient's condition, so that the results can be a reference for nutritionists in hospitals.

This research is important for several reasons. First, the prevalence of uterine myoma is quite high and often induces some clinical problems that require surgery. Second, diabetes mellitus and anemia are two comorbidities that are also high in Indonesia, so the combination of the those condition is not uncommon in health facilities. Third, the success of nutrition interventions in these complex cases can make an important contribution to the development of evidence-based practice in clinical nutrition care. In addition, this study also serves as a means of education for patients and families about the importance of postoperative dietary arrangements, as well as strengthening the role of nutritionists in the hospital's multidisciplinary team.

In terms of literature, this study is closely related to the findings of Dashti & Mogensen (2017) which emphasizes the importance of small but frequent servings to increase patient intake, Leidy et al.'s (2009) study on the effect of portion size on appetite hormone regulation, and the study of Chew et al. (2021) which shows the impact of nutritional supplementation on the clinical outcomes of patients at risk of malnutrition. The results of Brown's (2022) research also confirm that changes in eating behavior are not only determined by knowledge, but also influenced by psychological and social factors, so nutrition interventions must consider educational and counseling aspects. Thus, this study fills the literature gap by presenting empirical data on nutritional care of patients after uterine myoma surgery with multiple comorbidities, which has not been widely reported so far.

The purpose of this study is to describe nutritional care in postoperative uterine myoma patients with comorbid anemia and diabetes mellitus, including assessment, diagnosis, intervention, as well as monitoring and evaluation. In addition, this study was conduct to evaluate the impact of nutritional interventions on dietary intake, nutritional status, and patient knowledge about proper diet. The results of the study are expected to contribute to the development of more comprehensive clinical nutrition care practices, especially in patients with complex conditions.

Thus, this research has scientific and practical relevance, as it is able to bridge the gap

between clinical nutrition theory and real practice in the field. The case study approach used is expected to provide a contextual picture that is useful for other health workers, especially nutritionists, in developing more personalized, effective, and sustainable interventions

METHODS

This study is an instrumental single-case study with a quantitative-qualitative descriptive approach to document the clinical nutritional care process in a postoperative uterine myoma patient with comorbid iron deficiency anemia and type 2 diabetes mellitus (T2DM). The research was carried out in the surgical inpatient room of the hospital for 4 days (18–21 February 2025). The measurement was conducted by an operator who had been trained.

Case Presentation

The patient is a 43-year-old woman with a diagnosis of anemia + uterine myoma + type 2 diabetes mellitus. The patient has a history of previous illnesses in the form of: Caesarean section (2012), diagnosed with Systemic Lupus Erythematosus (SLE) (2010), and mild stroke (2017). It was recorded that the patient entered the hospital on February 18, 2025 to perform uterine myoma removal surgery on February 19, 2025 so that the patient was fasted from morning to afternoon on that date.

Assessment

Anthropometric data was obtained in the form of 18.3 cm MUAC and 25.2 cm Ulna, which is more likely to be done because the patient is in bed-rest conditions. MUAC measurement is used to determine the nutritional status of the patient while the Ulna measurement is used to calculate the estimated height and the estimated ideal weight of the patient. The Length of Ulna was used to predicted the body height, and MUAC was used to calculate the nutritional status.

Nutritional Diagnosis

Nutritional diagnosis is guided by the International Dietetics & Nutrition Terminology (IDNT) Reference Manual 4th edition.

Intervention

Interventions are provided based on etiology in nutritional diagnosis that is enforced by referring to the International Dietetics & Nutrition Terminology (IDNT) Reference Manual 4th edition and adjusting the policies that have been implemented by the hospital.

Monitoring and evaluation

Monitoring and evaluation are carried out on the parameters that appear in the signs and symptoms of nutritional diagnosis and refer to the International Dietetics & Nutrition Terminology (IDNT) Reference Manual 4th edition.

RESULTS AND DISCUSSION

Anthropometry

Estimated Body Height (BH) with ulna:

97,252 + (2,645 x Ulna) = 97,252 + (2,645 x 25)

= 163 cm

Estimated Ideal Body Weight:

$(BH)^2$ x 22,5 = $1,63^2$ x 22,5 = 59,7 kg

Nutritional status based on MUAC percentile:

MUAC/(MUAC standard) x 100% = 29/32.2 x 100% = 90% (Normal)

Biochemistry and clinical physicality

The results of laboratory examinations showed at **Table 1**. Patients complained of abdominal pain, weakness, and nausea which caused the patient to experience a decrease in appetite and blood pressure of 130/80 mmHg. Other clinical physical data are shown in the **Table 2**.

Dietary

Based on the estimated calculation of anthropometric data, the results of the calculation of daily needs are obtained as follows:

Calorie requirement =

BBI x 25 = 59,7 x 25 = 1.492,5 kcal

Age adjustment correction 5% = 74,62 kcal

Correction of physical activity adjustment 10% = 149,25 kcal

Adjustment correction of stress factor 20% = 298,5 kcal

Table 1. Results of biochemistry laboratory data measurement

Yes	Parameters	Examination Results	Normal Values	Unit	Information
1	Hemoglobin	7,9	11-15	gr/dl	↓
2	Erythrocyte	4,39	4,1 – 5,5	Million	N
3	HCT	27,7	34 – 45	%	↓
4	MCV	18	72 – 92	Fl	↓
5	MCH	20,3	23 – 31	Pg	↓
6	MCHC	28,5	31 – 35	g/dL	↓
7	Leukocyte	8,55	4,8 – 11	µL	N
8	GDS	284	<200	mg/dL	↑

Table 2. Results of clinical physical examination

CLINICAL EXAMINATION	RESULT	NORMAL VALUES	UNIT	KET
Pulse	92	60-100	per minute	N
SPO2	98	95 – 100%	%	N
RR	20	28	per minute	↓
Temperature	36,2	35,8 – 36,9	Oc	N

Table 3. Results of the calculation of the patient's food intake used the 24h recall method

	Result	Necessity	Percentage (%)	Category
Energy (kcal)	501,1	1.535	32	Severe deficit
Protein (gr)	23,1	76,75	30	Severe deficit
Fat (gr)	18,5	42,6	43	Severe deficit
Carbohydrates (gr)	58,8	211,06	27	Severe deficit
Fiber (gr)	2,9	30	0,09	Severe deficit
Iron (gr)	2,6	18	14	Severe deficit

Total calories in a day =

1.492,5 – 74,62 +122.8 + 298,5 = 1.839,18 kcal

Based on the calculation of daily calories, the macronutrient needs are as follows: protein 367,18 kcal (91,95 gr), fat 367,18 kcal (40,8 gr), and carbohydrate 1103,508 kcal (275,88 gr). The patient's fiber needs are 30 grams/day and iron 18 grams/day. During in the hospital, the patient's diet follows the schedule given by the hospital, which is three main meals with three interludes. Patients get a soft Diabetic food die. The calculation of the patient's food intake during in the hospital was obtained using the 24-hour recall method during the patient was in the hospital with the average intake during the hospital as showed in the **Table 3**.

It is known that the patient does not have a history of drugs and foods allergies. The previous diet history was obtained by the SQ-FFQ method and the following results were obtained: patient diet 1-2x/day. The main source of carbohydrates is rice as a staple food, corn and bread 2x a week, steamed potatoes and sweet potatoes 1-2x /week. Animal-based-protein sources that is often consumed was chicken and eggs once every 1-2 days, fish 2x a week (cob, catfish, and eels), the plant-based-protein that is often consumed is tempeh 2-3x / day. The types of vegetables that are often consumed are walnuts and long beans 2x/day, while fruits that are often consumed are grapes 1-2x/week, bananas, apples and papaya 3x/week. It is known that patients have a habit of consuming herbal medicines 2-3x / day with the following composition: turmeric, suruh, mint leaves, and boiled butterfly pea flowers. Patients also have a habit of consuming sweet cakes and fried foods 3-4 times a week as a snack and a habit of using MSG in processing food as much as 1/2 tsp per cooking.

The types of drug therapy that taken by patients over the past 3 months were: Dexketoprofen 3x1, tranexamic acid 500 mg 3x1, bledstop 2x1, inbion 1x1, Dulcolax supp 1x1, metformin XR 500 mg, and 0-0-14 IU.

Nutritional Diagnosis

Based on these cases, there are three nutritional diagnoses that appear as follows:

1. (NI-2.1) Inadequate oral intake related to nausea and abdominal pain as evidenced by less intake (based on recall results) than should be required (energy 32%, protein 30%, fat 43%, and carbohydrates 27%.
2. (NI-5.1) Increased levels of certain nutrients (iron and protein) related to postoperative recovery and anemia status in patients as evidenced by lower levels of Hb, MCV, MCH, MCHC, and HCT
3. (NB-1.5) Disordered eating pattern related to SLE condition as evidenced by the frequency and amount of low food intake, poor nutritional status, and weakness. To gauge the patient's level of knowledge, pre-test and post-test are used.

Intervention

Nutritional interventions provided include:

1. (ND-1) Giving the main meal gradually (small but frequent portions) with the purpose that the patient does not have difficulty in consuming food to meet daily needs. The diet given is a DM diet, high in protein to help control blood sugar and improve anemia conditions in the form of soft foods to make them easier to consume. The feeding of the diet in three days showed in **Table 4**.
2. (C-1) Provide nutrition education to increase knowledge for improving diet when patients Discharged from the hospital. The nutrition education approach is carried out to patients and her family who help to provide food at home.
3. (RC-1) Collaborate with doctors and nurses regarding the administration of drug to enhance the recovery and the success of the nutrition intervention.

Monitoring & Evaluation

Monitoring process is carried out based on the parameters contained in the signs and symptoms of the diagnosis. These parameters include daily peroral intake taken by the 24h-recall method as well as anemia indicators in biochemical data (Hb, MCV, MCH, MCHC, and

HCT), BB estimation based on MUAC calculations, and changes in the patient's diet after discharge from the hospital have not been able to be carried out in the observation of this case study

Table 4. Patient Meal Menu

Day	Menu					
	Morning	Morning Distraction	Noon	Afternoon Snack	afternoon	Afternoon interlude
1	fast	-*SKI Mutiara* -cut fruits (melons and apples)	- *Bubur sumsum* - Juruh gula Tropican - Egg Curry - Tempeh *sayur asam* (chickpeas and chayote)	- cut fruit (watermelon and dragon fruit)	-*Nasi tim* -Fried chicken with honey -Tempeh with sesame sauce -Soup (macaroni and chickpeas)	*Tropicana* cookies
2	- Nasi tim - shredded chicken - Sayur asem (chayote, toge, long beans)	Diabetasol milk	- Nasi tim - Fuyunghay - tofu balls - soup (mushrooms, broccoli, corn)	Cut Fruit (Papaya, Dragon Fruit)	- Bubur nasi - Yakitori Chicken - tahu tim - soups (sausages, tomatoes, broccoli)	*Tripocanian* cookies
3	- Nasi Tim - Egg Sauce - *Sayur bening* (carrots, prawns, tomatoes)	- *SKI Mutiara* - cut fruit (watermelon, dragon fruit)	- *Nasi tim* - *Ayam rempah* - Tempeh Satay - *Bobor bayam* (spinach, corn, chayote)	cut fruit (watermelon and dragon fruit)	*Nasi tim* Bakmoy (chicken and tempeh) *Tumis wortel toge*	Tropicana cookies

Table 5. Patient's daily dietary intake

Nutrient	Necessity	Day 1	Day 2	Day 3	Average
Energy (kcal)	1.839,18	1.218,5 (66,25%)	1.158,2 (62,97 %)	1.302,1 (70,79%)	1226,3 (66,67%)
Protein (gr)	91,95	75,5 (82,12%)	63,2 (68,73%)	69,1 (75,15%)	69,3 (75,36%)
Fat (gr)	40,8	49,5 (121,32%)	43,1 (105,64%)	37,4 (91,67%)	43,3 (106,13%)
Carbohydrates (gr)	275,88	118,4 (43,05%)	148,8 (53,94%)	170,7 (61,87%)	146 (52,92%)
Fiber (gr)	30	9,7 (32,3%)	9,7 (32,3%)	7,6 (25,3%)	9 (30%)
Iron (gr)	18	9,2 (51,1%)	7,5 (41,7%)	7,6 (42,2%)	8,1 (45%)

because it requires recommendations from doctors and related nutritionists.

1) Dietary

The patient's food intake data for 3 days was monitored using the 24h recall method and the following data in **Table 5**.

2) Anthropometry

The anthropometry result is showed in **Table 6**.

3) Biochemistry

Biochemical data is obtained from the observation of data contained in the patient's medical record so that biochemical data is only obtained when the patient is admitted to the hospital.

4) Nutrition counseling

Nutrition counseling explained the general picture of the disease and dietary recommendations given with pre- and post-tests carried out to see the extent of exposure to the information that the patient has obtained. The pre- and post-test results are shown in **Table 7**.

Based on the results of the assessment, there are three main nutritional problems used in the implementation of the diagnosis, namely: lack of oral intake, increased protein and iron needs, and a history of imbalance in the patient's daily diet.

At the first diagnosis, the lack of oral intake can be caused by nausea and pain in the abdominal area that causes the patient to experience a decrease in appetite. To overcome this, the adjustment of the portion and form of food given must be adjusted. Small and frequent meals are the division of daily meals into small portions with more frequent than usual (6-10 meals per day) with a total intake according to daily needs. This is so that the amount of food provided can approach or reach the desired daily needs. In Table 5, it can be seen during the observation carried out for three days that the average patient intake is 1226.3 (79.9%) of the total daily requirement. This shows that the provision of intake is still unsuccessful (<80% of daily needs). The low intake of the patient during the intervention can be caused by the clinical condition such as vomit and felt hurt in abdominal area. The intake of fiber and iron was reported low. these conditions caused by some factors such as: low food intake and the amount of fiber and Iron from the total meal is not achieve the recommended daily intake. Thus, these conditions need the recommendation to add some supplement of Iron and increase fiber intake trough fruits as a snack. However, when compared to the pre-intervention intake data in **Table 3**, there was a significant increase in intake.

Table 6. MUAC measurement results

	Day 1	Day 2	Day 3
MUAC (cm)	18,3	-	18,3
Nutritional Status	Normal	Normal	Normal

This can be caused by feeding in small but frequent portions divided into 3 main meals and 2 interludes. Previous research has shown that feeding in small but frequent portions can affect the regulation of two hormones that affect appetite (insulin and ghrelin). In addition, the provision of soft food is also one of the factors that can affect the increase in the patient's food intake. The texture of soft food makes it easy for patients to chew, swallow, and digest food. In cases, the patient experiences pain in the abdomen, so feeding in soft form does not aggravate the pain. (Dashti & Mogensen, 2017) (Prince, 2019) (Leidy et al., 2009) (Mutia & Rachmawati , 2020)

Monitoring and evaluation of the patient's nutritional status through estimated weight calculation from MUAC. Based on Table 6, the results of MUAC did not show any changes in nutritional status. This is due to the intake that has not reached >80% and looking for the time needed to change the MUAC value. In addition, with good intake, LILA improvement takes 3 – 6 months for a person with poor nutritional status (Chew et al., 2021)

Monitoring and evaluation of biochemical data cannot be done because the examination of laboratory data on patients is only carried out at the beginning (when the patient is admitted to the hospital). The frequency of measuring laboratory data depends on several things including: the patient's clinical condition, the patient's individual needs, and the specific needs of the doctor's recommendation. In addition, monitoring and evaluation related to laboratory data cannot be carried out because the patient's hospitalization period is only 3 days and laboratory data is not checked before the patient is discharged from the hospital. (Yalçındağ et al., 2024)

Table 7. Patient's Pre- and Post-test results

Yes	Question	Pre-test	Post-test
1	What happens if the body can't use insulin properly?	√	√
2	What happens to people with systemic Lupus Erythematosus (SLE)	x	√
3	What are the common symptoms experienced by people with uterine myoma	√	√
4	What types of animal side dishes are perils avoided/prohibited for people with diabetes mellitus accompanied by hypertension?	√	√
5	Why is blood sugar control important in people with diabetes mellitus?	√	√

Based on the results of nutrition education, there were no significant changes to the pre- and post-test results. This is likely because the patient has received previous education which is corroborated from the length of time the patient has been diagnosed with the disease. It can be concluded that the diet problem is not caused by lack of knowledge, but because the patient cannot change the wrong eating habits. There are several factors that can cause a person's failure to change habits, such as psychological factors, social factors, and environmental factors. (Brown, 2022)

CONCLUSIONS

Overall, this case study shows that structured nutritional interventions can improve the nutritional adequacy of postoperative uterine myoma patients with comorbid anemia and type 2 diabetes mellitus. However, improving nutritional status and clinical conditions takes longer and continuous support from multidisciplinary health teams.

CONFLICT OF INTEREST STATEMENT

The authors declare that this study was conducted independently and no conflict of interest exists, either financial or non-financial, that could influence the research outcomes or the publication of this article.

ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude to the hospital where this study was conducted, as well as to all medical staff who provided support and assistance during data collection. Special thanks are also extended to the patient and her family for their willingness to participate in this study. The authors gratefully acknowledge the valuable guidance, support, and input from colleagues and academic supervisors at the Nutrition Department, Poltekkes Malang, throughout the research process and manuscript preparation.

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