

*Case Report***Acute Myeloid Leukemia****Noyonika Banerjee¹***Santokba Durlabhji Memorial Hospital, Jaipur***Abstract**

Cancer is one of the major causes for mortality all over the world. Besides this, treatment modalities provided for cancer including chemotherapy or radiation therapy or hematopoietic cell transplant also lead to burden of malnutrition by imposing many nutrition related problems like loss of appetite, xerosis, mucositis, etc. that is precipitated in malnutrition. Different types of blood cancer are seen in the pediatric population also. Present case report was planned out to study various aspects of a patient suffering from acute myeloid leukemia (AML). Patient came in with complaints of fever and fatigue and was diagnosed with AML after review and investigations. Her nutritional care process including - nutritional assessment, intervention and monitoring has been shown in the present report according to which, it was evident that the patient recovered well with good nutrition compliance.

Keywords

Leukemia, blood cancer, nutritional concerns, nutritional status, food intake, healthy diet

Introduction

Optimum health is of prime importance. Although a lot of medical and technological advancement has been achieved in prevention and treatment of diseases, still cancer is one of the leading causes of mortality globally. Acute myeloid leukemia (AML) is a type of cancer of the myeloid line of blood cells that is characterized by the rapid growth of abnormal cells in the bone marrow and blood and interferes with normal blood cell production. As there is a decrease in the counts of white blood cells, therefore patients are more susceptible to infections. Some common features of AML are fatigue,

shortness of breath, easy bruising and bleeding, decreased immunity followed by increased risk of infections.

Common treatment modality for AML is primarily chemotherapy with or without radiation therapy, or a bone marrow transplant. Positive effect of good nutrition has been documented in other studies as well¹.

Case description

Patient Profile: A 25 year old Hindu female was admitted to the hospital with the complaints of fatigue, weakness, giddiness and recurrent fever with a rash on the lower limbs. She was engaged in a private job belonging to a higher income group having no. of family members a 4 including 2 adults and 2 children.

Examination

Anthropometric measurements	
Weight	60kg
Height	165m
BMI	22.05 kg/m ²
BMR/REE	1311 kcal
Physical activity	Sedentary (1.40)

Review: The patient had no previous history of any known disease or surgery except two lower segment c- sections.

Negative history was noted for diabetes, hypertension, TB and asthma. With this there was no significant family history except one first cousin having leukemia.

At the time of admission, her vitals were as below -

Blood pressure 137/76, Pulse 90/min, SpO₂ 97% and temperature 102 °F

Investigations: The patient underwent many investigations in order to rule out final medical diagnosis. Investigations have been shown below

Parameter	Result values	Reference ranges
WBC	20.93	4.00 – 10.00 $10^3/\mu\text{L}$
RBC	3.23	3.8 – 4.8 $10^6/\mu\text{L}$
Haemoglobin (Hb)	9.5	12.0 – 15.0 g/dL
Platelets count	38	150 – 410 $10^3/\mu\text{L}$
Serum Sodium	135.0	137 – 145 mmol/L
Serum Potassium	4.0	3.5 – 5.1 mmol/L

In view of family history, bone marrow aspiration and biopsy was performed in which 58.6% blasts were seen with single auer rods hyperplasia with shift to left. Dyplastic neutrophils were present. Therefore final medical diagnosis was found as **Acute myeloid leukemia**.

Medication/ treatment:

Name	Dose	Mode of Action
Tab. Ceftum	500mg	Antibacterial
Tab. PCM	650 mg	Analgesic
Inj. Amikacin	750 mg	Antibacterial

Inj. Teicoplanin	400 mg	Antibiotic - Prophylaxis and treatment of serious infections caused by gram positive bacteria like S. Aureus.
Inj. Meropenam	1 gm	Antibiotic
Inj. Pantop	40 mg	Antacid

Dietary history: Patient's 24 hour home diet recall for 3 consecutive days was noted and then it was converted to find out nutrient intake in comparison to the requirements². Nutritional intake on the basis of average intake of 24 hours home diet recall was observed as following

Energy: 1153 Kcal
Proteins: 48 gms
Carbohydrates: 172 gms
Fats: 25 gms
Empty calories: 40 Kcal/day
Fluid intake: 1800 ml

Nutritional Diagnosis (MNT): Healthy (SGA rating- A)

Patient was found nutritionally healthy as it was an acute infection, not a chronic condition at the time of diagnosis and at that time patients diet intake was adequate & physical activity was also normal.

Nutritional Intervention

Medical nutrition therapy (MNT) - High Protein Normal Diet

Short Term Goals

- To maintain lean body mass
- To improve overall nutritional status
- To prevent catabolism and protein breakdown.

Long term Goals

- To provide adequate nutrition in order to avoid macro and micronutrient deficiency
- To impart nutrition education related to healthy eating patterns
- To improve overall quality of life

Nutritional Requirements as per the standard guidelines were as below³

Energy: 1800 Kcal (30 kcal/ Kg IBW)

Protein: 72 g (1.2 g / Kg IBW)

Carbohydrate: 270 g (60% of energy needs)

Fat: 40 g (20 % of energy needs)

Fluid requirements: 2100 ml

NNC: 1512 kcal

Cal: N₂ ratio: 1800:11

Antioxidants/ immune-nutrients: Vitamin C (ascorbic acid) 20 mg / 1000 kcal for better iron absorption. Sips of ginger ale as it contains antioxidant properties and also helps in preventing dehydration eases symptoms like nausea.

Consistency and frequency of meals: High protein normal diet with 6-7 meals /day

Supplement: Kabipro protein powder 4 scoops / day

Prescribed hospital menu:

Food group	Exchanges	Energy (Kcal)	Proteins (g)	Carbohydrates (g)	Fats (g)
Milk	3	276	19.2	22.5	6.75
Cereals	8	800	28.8	168	4
Pulses	2	172	12	15	0.6

Vegetables	4	204	8	40	0.4
Sugar	5	100	0	25	0
Oil	4	180	0	0	20
Kabipro	4	172	20	19.6	1.6
Salt	5 g	0	0	0	0
Total		1904	88	290.1	33.35

Distribution of exchanges in a 24 hours sample menu

Timings	Meal	Menu	Household Measures
7 am	Early morning	Tea	1 cup
		Biscuits	2 nos.
8 am	Breakfast	Milk + kabipro	1 glass + 1 scoop
		Breakfast	1 katori
11 am	Mid- morning	Milk + kabipro	1 cup+ 2 scoop
1 pm	Lunch	Seasonal veg.	1 katori
		Dal	1 katori
		Chapati	3

		Pulav	1 katori
4 pm	Evening tea	Snack	1 katori
8 pm	Dinner	Seasonal veg.	1 katori
		Dal	1 katori
		Chapati	3
		Pulav	1 katori
9 pm	Bed time	Milk + Kabipro	1 glass+ 1 scoop

Monitoring and reassessment during hospitalization at the time of discharge

1. Anthropometry: No further changes observed
2. Biochemical parameters: Changes observed were as below -

Parameters	Day 1	Day 5	Day 8	Day 10	Day 12	Day 14	Day 18	Day 20	Day 22	Day 24
WBC	20.93	10.69	0.59	0.62	0.92	0.89	0.73	0.88	1.0	1.68
RBC	2.23	3.17	3.01	3.11	3.25	2.88	3.01	2.95	2.77	3.15
Haemoglobin	9.5	9.1	8.6	8.7	9.2	8.1	8.6	8.4	8.0	9.1

Platelet count	18	30	57	23	42	18	55	71	136	236
Sodium	130	134.5	134.3	132.5	137.1	-	-	-	-	135
Potassium	4.0	3.19	3.96	4.21	4.08	-	-	-	-	4.0

Clinical Signs and symptoms: Patient was afebrile and stable at the time of discharge with no signs of SOB.

Diet compliance: Patient's diet intake was noted as per prescribed diet.

Recall of the prescribed MNT

	Energy (kcal)	Protein (gm)	CHO (gm)	Fat (gm)
Day 1	1904	88	290.1	33.35
Day 2	1904	88	290.1	33.35
Day3	1904	88	290.1	33.35
Total	5712	264	870.3	100.05
Average	1904	88	290.1	33.35
% requirements	+5.77	+22.2	+7.4	-16.6

Diet prescribed at the time of discharge - High protein normal diet

Energy: 1800 Kcal (30 kcal/ Kg IBW)

Protein: 72g (1.2g/ Kg IBW)

Carbohydrate: 270 g (60% of energy)

Fat: 40 g (20% of energy)

Recommendations - Patient was counseled to incorporate food items containing protein of high biological value such as milk, paneer, fish, eggs, chicken after proper cooking and hygienic precautions were recommended as the patient was non vegetarian.

Fluid req: 2100ml

Discharge Diet -

Time	Meal	Menu	Quantity
7:30 AM	Early morning	Tea	1 cup /100ml
8:30-9:30 AM	Breakfast	Milk + kabipro	1 glass+2 scoop
		Daliya/ rabdi/ Poha/ oats / beetroot paratha	1 bowl/100g
11:00 AM	Mid morning	Milk + kabipro	1 glass+2 scoop
1:00-2:00 PM	Lunch	Chapati	3 - 30g each
		Dal	25g raw / 100 g cooked
		Vegetable	1 K 100g
5:00 PM	Eve Tea	Snack	1 katori

8:00-9:00 PM	Dinner	Salad	100 g
		Chapati	2- 30g each
		Dal	25g raw/ 100 g cooked
		Vegetable	1K 100g
9:30 PM	Bed time	Milk/Tea	100ml
		Dates/munakka -boiled in milk	4-5 pc

Follow up

Follow up will be done after 1 month and the patient will be evaluated on the basis of anthropometric measurements, biochemical investigations, clinical signs and diet compliance.

Discussion

Many studies have demonstrated that nutritional related problems are a major risk factor for patients in causing malnutrition, morbidity and mortality. There are many barriers to non adherence to nutritional guidelines including lack of knowledge, awareness, attitude, scanty evidence and lack of collaboration ⁴. Therefore nutritional assessment of patients is of utmost importance.

Tan et al. (2013) found AML patients towards an overweight side in comparison to the control group although statistically not significant. In the same study, nutrient intake of

these patients was found towards a significantly lower side than the control group. It was attributed to less physical activity or side effects of drugs ⁵.

Medical nutrition therapy has been considered as an inevitable tool for prevention and treatment of malnutrition in cancer patients.

Nutrition education and spreading awareness about nutritional guidelines, team work including patient inputs and feedback while planning nutrition intervention may prove a very effective tool in maintaining nutritional status of a cancer patient ⁶. Malnutrition is an adverse prognostic factor in leukemia⁷ but it can be prevented if appropriate nutritional assessment is done by a registered dietitian and proper nutrition care process is followed carefully under supervision of a multidisciplinary team as was evident from the present case report.

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