

Original Research Article

Nutritional management of anaemia in a heart failure patient

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Abstract

Anaemia is very common in hospitalized patients. It leads to poor outcome due to weakness, fatigues, irritability, anorexia, increased risk of infections and reduced functional capacity. Therefore present case study was selected to study nutritional management of anemia in a heart failure patient. On the basis of subjective global assessment (SGA), patient was found at risk of malnutrition. He was severely anemic with poor food intake due to hematemesis and blood in stools as evidenced by low haemoglobin levels and generalized weakness. After assessment and diagnosis, the patient was given high protein, iron and vitamin c rich low fluid, low salt diet. At the time of discharge, a good improvement was found at the time of discharge as his haemoglobin levels, functional capacity and diet intake were improved. Patient was found more active at the time of discharge. Thus dedicated multidisciplinary health care team including a dietician plays a very important role in better outcome of patient.

Keywords: Anaemia, Heart failure, Nutritional management, Nutritional status

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Introduction

Anemia is a prevalent condition among hospitalized patients, especially those with chronic illnesses and nutritional deficiencies. It has been reported that anemia affects nearly one-third of the world's population, and its prevalence is particularly high among patients who are admitted to healthcare facilities due to acute or chronic health conditions [1]. Hospitalized patients are often at an increased risk of anemia because of factors such as poor nutritional intake, inflammation, underlying disease, and frequent blood sampling [2]. Addressing anemia in hospitalized patients is essential, as untreated anemia can lead to increased morbidity, extended hospital stays, and greater healthcare costs [3].

Nutritional interventions play a crucial role in the management of anemia, particularly in cases where anemia is driven by deficiencies in essential nutrients, such as iron, vitamin B12, and folic acid. Studies have shown that iron-deficiency anemia (IDA) is the most common nutritional anemia globally, accounting for approximately 50% of all anemia cases [4, 5]. In hospitalized patients, inadequate dietary intake, mal-absorption, and the inflammatory response are key contributors to nutritional anemia [6]. Ensuring adequate intake of iron, vitamin B12, and folic acid through tailored nutritional interventions has been demonstrated to improve hemoglobin levels and overall health outcomes in affected patients [7]. Timely diagnosis and treatment is of utmost importance in order to save life or quality of life.

Patient profile

A 65 years old Hindu male was admitted to Mahatma Gandhi Medical College & Hospital with the complaints of pain in abdomen, chest pain, ghabrahat, loss of appetite, generalised weakness, 1 episode of hemetemeses, blood in stool since 2 days ago and shortness of breath. He was a factory worker and belonged to middle income group. Number of family members were five including two adults and three children.

Past Medical history

Blood Transfusion in 2010

Final Medical diagnosis

As per clinicians, final medical diagnosis was: Severe Anaemia, Heart Failure with EF- 30 to 35%, Moderate to Severe MR, SOB, Duodenal Ulcer.

Medications/ treatment

Medicines	Dose	Mechanism of action
INJ. PANTOP	40 mg	Antacid
INJ. EMESET	54 mg	Antiemetic
INJ. OPTINEURON	1amp +100 ml NS	Multivitamin
SYP. SUCRALFATE	2 tsp	To treat and prevent duodenal ulcers
INJ. PIPTAZ	2.5 mg	Antibiotic
INJ. LIVOFLOX	500 mg	Antibiotic

Nutrition Care Process

Nutritional assessment: Patient's nutritional status was analyzed on the basis of anthropometry, biochemical profile, clinical signs and symptoms and diet intake as shown below:

1. Anthropometric measurements

Weight (kg)	60
Height (cm)	160
BMI (kg/m ²)	23.4
Target/Adjustable body weight	60 kg
Triceps Skin fold thickness	25 mm
Waist circumference	55 cm
Hip circumference	65 cm

W/H ratio	0.8
BMR/REE	1219 kcal
Physical activity (calculate as per NIN charts)	1.8

2. Biochemical profile

Blood Investigations - CBC, Electrolytes, RFT and LFT

Investigation	At the time of Admission	At the time of Discharge	References Range
CBC			
WBC	6.2 10^3 /ul	7.3 10^3 /ul	4.0-10.00 10^3 /ul
RBC	1.4 10^6 /ul	3.4 10^6 /ul	Adult: 3.8 - 4.8 10^6 /ul
Platelets	239 10^3 /ul	197 10^3 /ul	150-410 10^3 /ul
Haemoglobin	V.L 3.5	L 6.7	12.0-15.0 g/dl
Electrolytes			
Sodium	134.1	135	137.0-145.0 mmol/L
Potassium	4.6	4.0	3.5-5.1 mmol/L
Chloride	105.6	100.8	98.0-107.0 mmol/L
RFT			
Blood Urea	102.3	23.7	15.0-45.0 mg/dl
Creatinine	1.8	0.6	0.52 -1.25 mg/dl
Uric Acid	H 12.2	6.1	2.5 – 6.2 mg/dl
LFT			
Serum Bilirubin Total	0.3	1.0	0.2 – 1.3 mg/dl
Serum Bilirubin direct	0.2	0.3	<0.3 mg/dl
Serum Bilirubin indirect	0.1	0.8	0.1 – 0.9 mg/dl
SGOT/AST	L 13.1	15.4	15.0 – 46.0 U/L
SGPT/ALT	13.5	45.2	13.0 – 69.0 U/L

Serum alkaline phosphatase	L 26.1	39.6	38– 126 U/L
Serum total protein	L 4.8	6.2	6.3-8.2 g/dl
Serum albumin	2.4	3.2	Adult 3.5-5.0 g/dl
Serum globulin	2.4	2.0	2.0-3.5 g/dl
A/G ratio	L 1:0	1:1	1.2-2.5:1

3. Clinical data: Patient showed clinical signs of SOB, ghabrahat, chest pain, abdomen pain, loss of appetite, hemetemesis, blood in stools and generalized weakness.

4. Dietary history

24hrs - Home recall + empty calories intake from food frequency table

Time	Meal	Menu	Quantity
8:00 AM	Breakfast	Tea	1 Cup
		Biscuit	3-4
1:00 PM	Lunch	Chapati	4
		Veg	1 Bowl
		Chach	1 Glass
4:00 PM	Snack - Time	Tea	1 Cup
		Biscuit	3-4
7:00 PM	Dinner	Chapati	4
		Dal	1 Bowl

		Veg	1 Bowl
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• **Food frequency table**

Food items	Daily	Weekly	Fortnightly	Monthly	Total empty caloric intake (in-Frequent items i.e. times consumed X No. of serving /No. of days)
In frequent foods e.g. Pickle /papad /chaat/outside foods/beverages, etc.		1-2 times			
Fat	20g m				180
Sugar	20 gm				80
Cold drink	-				

Nutritional calculation of home diet recall:

- **Energy:** 1311 Kcal
- **Protein:** 38.1 gm
- **Carbohydrates:** 200.3 gm
- **Fats:** 32.4 gm
- **Empty calories:** 260 Kcals
- **Fluid req.:** IBW*35= 60*35= 2100 ml

Nutritional diagnosis

On the basis of Subjective global assessment (SGA), patient's nutritional diagnosis was SGA rating B. Patient was found to be severely anemic with poor food intake due to hemetemeses and blood in stools as evidenced by low haemoglobin levels and generalized weakness

Nutrition Intervention

Medical Nutrition Therapy: High Protein Low Fluid iron rich Normal Diet

Goals

1. Short term goals-
 - To meet calorie and protein requirements.
 - To maintain biochemical parameters.
 - To provide adequate nutrition.
 - To increase appetite.
 - To increase hemoglobin levels.
2. Long term goals-
 - To maintain ideal body weight.
 - To increase appetite
 - To provide adequate nutrition to prevent macronutrient and micronutrient deficiencies.

Nutritional requirements

- **Energy** – $IBW \times 30$. $60 \times 25 \times 1.2 = 1800$ kcal
- **Proteins** - $IBW \times 1.2$. $60 \times 1.2 = 72$ gm (16% of total calorie)
- **Carbohydrates** – 270 gm (60% of total calorie)
- **Fats (Source of fats)** - Oil/Ghee- 48 gm (24% of total calorie)
- **Sodium** – 3000-4000 gm
- **Potassium** - 3500 mg
- **Fluid requirements** – $IBW \times 30$. $60 \times 35 = 2100$ ml
- **NNC** – 1512 kcal
- **Cal:N² ratio** - $1800:11.5 = 156:1$
- **Consistency and frequency of meals** – high protein, Low Fluid iron rich normal diet (3 major, 3 minor meals).

Monitoring and Evaluation

3 days prescribed hospital diet

	Time	Meal	Menu	Quantity	Calorie (kcal)	Protein (gm)	CHO (gm)	Fat (gm)	Na (mg)	K (mg)
DAY 1: High Protein Low Fluid Normal Diet	7:00 AM	Morning Tea	Tea	100 ml	48	1.6	7.3	1.5	22	0
			Biscuit	2	40	0.67	6.7	1.01	24	0
	8:00 AM	Breakfast	Milk	200 ml	112	6.4	9.6	6	88	0
			Poha	200 gm	68	2.17	13.81	0.2	0.4	132
	11:00 AM	Mid-meal	Rabdi	200 gm	136	4.2	27.6	0.4	0.8	264
	1:00 PM	Lunch	Chapati	4	384	12.4	68	1.6	2.4	378
			Salad	100 gm	19.6	0.7	3.48	0.16	6.33	183
			Moong dal	100 gm	97	7.1	15.7	0.4	3	380
			Bhindi	100 gm	23	0.8	4	0.1	8.8	253
			Jeera rice	100 gm	114.9	2.56	25.2	0.17	0.75	34.84
	4:00 PM	Evening Tea	Milk	100 ml	56	3.2	4.6	3	44	0
			Biscuit	2	40	0.67	6.7	1.01	24	0
	7:00 PM	Dinner	Chapati	4	384	12.4	68	1.6	2.4	378
			Salad	100 gm	19.6	0.7	3.48	0.16	6.33	183

			Arhar dal	100 gm	97	7.1	15.7	0.4	3	380
			Mix veg	100 gm	23	0.8	4	0.1	8.8	253
			Jeera rice	100 gm	114.9	2.56	25.2	0.17	0.75	34.84
			Oil	18 ml	162	0	0	18	0	0
			Butter	4 tsp	144	0	0	16	0	0
			Salt	1 tsp	0	0	0	0	2000	0
			Total		2083	66	309.07	51.9	2245.7	2853.6
DAY 3: High Protein Low Fluid Normal Diet	7:00 AM	Morning Tea	Tea	100 ml	48	1.6	7.3	1.5	22	0
			Biscuit	2	40	0.67	6.7	1.01	24	0
	8:00 AM	Breakfast	Milk	200 ml	112	6.4	9.6	6	88	0
			Poha	200 gm	68	2.17	13.81	0.2	0.4	132
	11:00 AM	Mid-meal	Rabdi	200 ml	136	4.2	27.6	0.4	0.8	264
	1:00 PM	Lunch	Chapati	4	384	12.4	68	1.6	2.4	378
			Salad	100 gm	19.6	0.7	3.48	0.16	6.33	183
			Kadi pakoda	100 gm	97	7.1	15.7	0.4	3	380
			Aloo sukhi sabji	100 gm	23	0.8	4	0.1	8.8	253
			Plain rice	100 gm	114.9	2.56	25.2	0.17	0.75	34.84
	4:00 PM	Evening Tea	Milk	100 ml	56	3.2	4.6	3	44	0
			Biscuit	2	40	0.67	6.7	1.01	24	0
	7:00 PM	Dinner	Chapati	4	384	12.4	68	1.6	2.4	378
			Salad	100 gm	19.6	0.7	3.48	0.16	6.33	183

			Moong dal	100 gm	97	7.1	15.7	0.4	3	380
			Mix veg	100 gm	23	0.8	4	0.1	8.8	253
			Fried rice	100 gm	114.9	2.56	25.2	0.17	0.75	34.84
			Oil	18 ml	162	0	0	18	0	0
			Butter	4 tsp	144	0	0	16	0	0
			Salt	1 tsp	0	0	0	0	2000	0
			Total		2083	66	309.07	51.9	2245.7	2853.6
DAY 5: High Protein Low Fluid Normal Diet	7:00 AM	Morning Tea	Tea	100 ml	48	1.6	7.3	1.5	22	0
			Biscuit	2	40	0.67	6.7	1.01	24	0
	8:00 AM	Breakfast	Milk	200 ml	112	6.4	9.6	6	88	0
			Poha	200 gm	68	2.17	13.81	0.2	0.4	132
	11:00 AM	Mid-meal	Rabdi	200 ml	136	4.2	27.6	0.4	0.8	264
	1:00 PM	Lunch	Chapati	4	384	12.4	68	1.6	2.4	378
			Salad	100 gm	19.6	0.7	3.48	0.16	6.33	183
			Masoor dal	100 gm	97	7.1	15.7	0.4	3	380
			Turai	100 gm	23	0.8	4	0.1	8.8	253
			Jeera rice	100 gm	114.9	2.56	25.2	0.17	0.75	34.84
	4:00 PM	Evening Tea	Milk	100 ml	56	3.2	4.6	3	44	0
			Biscuit	2	40	0.67	6.7	1.01	24	0
	7:00 PM	Dinner	Chapati	4	384	12.4	68	1.6	2.4	378
			Salad	100 gm	19.6	0.7	3.48	0.16	6.33	183

		Arhar dal	100 gm	97	7.1	15.7	0.4	3	380
		Mix veg	100 gm	23	0.8	4	0.1	8.8	253
		Jeera rice	100 gm	114.9	2.56	25.2	0.17	0.75	34.84
		Oil	18 ml	162	0	0	18	0	0
		Butter	4 tsp	144	0	0	16	0	0
		Salt	1 tsp	0	0	0	0	2000	0
		Total		2083	66	309.07	51.9	2245.7	2853.6

Recall of the prescribed hospital MNT

	Energy (kcal)	Protein (gm)	Carbs (gm)	Fats (gm)	Na (mg)	K (mg)
Day 1	2083	66	309.07	51.9	2245.7	2853.6
Day 3	2083	66	309.07	51.9	2245.7	2853.6
Day 5	2083	66	309.07	51.9	2245.7	2853.6
Total	6249	198	927.21	155.7	6737.1	8560.8
Average	2083	66	309.07	51.9	2245.7	2853.6
Percentage	92%	73%	65%	98.8%	56.1%	81.5%

Discharge diet - High Calorie, High Protein Normal Diet

- **Type of diet** - Vegetarian diet
- **Energy** - 1839.7 kcal
- **Proteins** - 72.4 gm
- **Carbohydrates** - 249.8 gm
- **Fats: Source of fats** -Oil/Ghee/Butter- 57.1 gm
- **Sodium** - 2244.8 mg
- **Potassium** - 2413.4 mg
- **NNC** - 1550.1 kcal
- **Cal:N² ratio** - 1839:11.5 = 154:1

- **Fluid requirements** - $IBW \times 30 = 75 \times 30 = 2250$ ml

Recommendations:

- High protein normal diet is recommended
- Take double toned or cow's milk
- Take dry fruits like almonds, munakka and walnuts with milk
- Avoid sodas and carbonated drinks and alcohol
- Avoid packed and canned foods
- Avoid mayonnaise and fried foods etc.

Exchange list for discharge diet

Food group	No. Of Exchanges	Calorie (kcal)	Protein (gm)	Cho (gm)	Fat (gm)	Na (mg)	K (mg)
Cereals	6	576.48	19.02	115.2	2.4	3.66	559.8
Pulses	3	293.1	21.3	47.1	1.2	9	115.2
Milk	4	224	12.8	19.2	12	176	-
Vegetable	5	115	4	20	0.5	44	1265
Fruits	2	124.6	0.4	26.2	1.2	2.8	232
Sugar	3	60	-	15	-	-	-
Fat	3	135	-	-	15	-	-
Paneer	50 gm	128.9	9.4	6.2	7.3	9	31.7
Dry Fruits	30 gm	182.7	5.5	0.9	17.5	0.4	209.7
Salt	1 tsp	-	-	-	-	2000	-
	TOTAL	1839.7	72.4	249.8	57.1	2244.8	2413.4

Distribution Of food exchanges in whole day

Food group	Exchange	Early morning	Break fast	Mid lunch	Lunch	Evening tea	Dinner	Bed time

Cereals	6	-	1	-	3	-	2	-
Pulses	3	-	-	-	1	1	1	-
Milk	4	1/2	2	-	1/2	-	-	1
Vegetable	5	-	1	-	2	-	2	-
Fruits	2	-	-	2	-	-	-	-
Fat	3	-	1	-	1	-	1	-
Sugar	3	1	1	-	-	-	-	1
Paneer	50 gm	-	-	-	-	1	-	-
Dry Fruits	30 gm	1	-	-	-	-	-	-

Discharge Diet Prescription

Time	Meal	Menu	Household measures
7 AM	Early morning	Milk	200 ml
		Overnight soaked almond/walnuts	30 gm
8 AM	Break Fast	Beetroot juice	200 ml
		Break Fast	100 gm
11 AM	Mid Lunch	Fruits- pomegranate/ apple/banana/ dates/papaya/kiwi	2
1 PM	Lunch	Chapati	2
		Veg	100 gm
		Dal	100 gm
		Salad	100gm
		Rice	100 gm
		Curd	100 gm
4 PM	Evening Tea	Paneer	50 gm
		Roasted chana	30 gm
7 PM	Dinner	Chapati	2
		Veg	100 gm

		Dal	100 gm
		Salad	100gm
9 PM	Bed Time	Milk	100 ml

5. Evaluation and follow up

Reassessment criteria

- Relevant anthropometry: Weight
- Biochemical parameters: CBC as haemoglobin levels are still need to be improved.
- Clinical signs and symptoms: Weakness and anorexia,
- Diet compliance: whether patient was able to follow prescribed diet or not.

Conclusion

Thus patient showed a good improvement at the time of discharge in terms of improved haemoglobin levels (3.5 at the time of admission to 6.7 at the time of discharge), functional capacity, improved diet intake, improved appetite, recovered SOB, ghabrahat and weakness. Patient was found more active at the time of discharge. Thus proper nutritional care is of utmost importance in order to achieve an optimal outcome.

References

1. Pasricha, SR, Black J, Muthayya S, Shet A, Bhat V, Nagaraj S, ... Shet AS. Determinants of anemia among young children in rural India. *Pediatrics* 2010; 126(1): e140-e149.
2. Goodnough LT, Schrier SL. Evaluation and management of anemia in the elderly. *American journal of hematology* 2014; 89(1): 88-96.
3. Lanier JB, Park JJ, Callahan RC. Anemia in older adults. *American family physician*, 2018; 98(7): 437-442.
4. World Health Organization. Worldwide prevalence of anemia 1993-2005: WHO global database on anaemia. WHO Press 2008.
5. Longo DL, Camaschella C. Iron-deficiency anemia. *N Engl J Med* 2015; 372(19): 1832-43.

6. Weiss G, Goodnough LT. Anemia of chronic disease. *New England Journal of Medicine* 2005; 352(10): 1011-1023.
7. Lopez A, Cacoub P, Macdougall IC, Peyrin-Biroulet L. Iron deficiency anaemia. *The Lancet* 2016; 387(10021):, 907-916.
8. Maria RI, Bertozzi I, Santarossa C, Cosi E, Lucente F, Bogoni G, Biagetti G, Fabris F. Prevalence and Causes of Anemia in Hospitalized Patients: Impact on Diseases Outcome. *J. Clin. Med.* 2020; 9: 950. doi:10.3390/jcm9040950
9. Bin Amer AS, Alghamdi SA, Alanazi AH, Alsayegh HM, Alluhaydan MF, Aleidi RS, Althiabi AS. Nutritional Interventions in Managing Anemia in Hospitalized Patients: A Laboratory and Clinical Perspective. 2023; 11(4): 1-p. IJRMPS2304231774