

Case Report

Nutritional management of an obese patient suffering from viral fever

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Abstract

Obesity presents unique challenges in the nutritional management of patients suffering from viral fever. The dual burden of excess adiposity and acute infection can impair immune response, prolong recovery, and complicate metabolic regulation. This paper discusses evidence-based dietary strategies for managing an obese patient with viral fever, emphasizing the need to balance energy restriction with adequate nutrient intake to support immune function and recovery. Key considerations include ensuring sufficient hydration, maintaining optimal protein intake to prevent muscle catabolism and providing easily digestible, nutrient-dense foods rich in vitamins A, C, D, E, and zinc to enhance immune resilience. Caloric intake should be moderately reduced to account for decreased physical activity but not to the extent that it compromises healing. Additionally, monitoring electrolyte balance and blood glucose levels is crucial, as obesity and infection may both alter metabolic pathways. The nutritional management plan should be individualized, incorporating the patient's comorbidities, medication regimen, and appetite changes due to fever. Ultimately, a well-structured diet, coupled with appropriate medical management, can improve recovery outcomes, reduce inflammation, and support long-term weight and metabolic health in obese patients experiencing viral fever.

Keywords: Obesity, viral fever, nutrition management, calories, protein

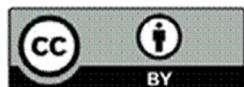
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Introduction

Obesity is a chronic, multifactorial condition characterised by an abnormal or excessive accumulation of adipose (fat) tissue that poses significant health risks ^[1]. The conventional metric for defining obesity is the body mass index (BMI), where a BMI of 30 kg/m² or higher in adults is typically classified as obese ^[2]. Globally, the prevalence of obesity has risen dramatically over recent decades: for example, in 2022 an estimated 16% of adults were living with obesity, while 43% were overweight. The rapid increase in obesity has been attributed to a constellation of influences, including higher energy intake (especially of energy-dense foods), reduced physical activity in daily life, shifts in urbanisation and work patterns, as well as genetic, psychosocial and environmental factors. Obesity is strongly linked to a broad spectrum of comorbidities - such as cardiovascular disease, type 2 diabetes mellitus, certain cancers, and musculoskeletal disorders - which together underscore its role as a major public health concern ^[3].

Case presentation

A 25 years old male was admitted at Mahatma Gandhi Medical College & Hospital, Jaipur. He belonged to a private job with a lower income group and the number of family members were two. At the time of admission, he was suffering from fever and cough.

Following investigations were done by clinicians -

Blood investigation

Patient was investigated for serum electrolytes, renal function test (RFT), liver function test (LFT), total proteins, complete blood count, PT - INR, hepatitis virus antibodies test, covid 19 (SARS- CoV-2), HIV 1 & 2 antibodies, hepatitis B surface antigen (rapid test). All reports were normal except bilirubin and RDW - CV count was found on a slightly higher side and total protein, haemoglobin and PDW counts were found towards the lower side (Table 1).

Parameter	Values obtained	Reference range
Complete blood count		
WBC	6.75 $10^3/\mu\text{L}$	4.0-10.00 $10^3/\mu\text{L}$
RBC	2.22 $10^6/\mu\text{L}$	Adult : 3.8-4.8 $10^6/\mu\text{L}$
Haemoglobin	L 10.8g/dl	12.0-15.0 g/dl
HCT	16.2 %	36.0-40.0 %
MCV	85.8 fL	80.0-100 fL
MCH	28.0 pg	27.0-32.0 pg
MCHC	32.6 g/dl	31.5-34.5 g/dl
Platelets Counts	125 $10^3/\mu\text{L}$	150-410 $10^3/\mu\text{L}$
RDW-CV	H 14.8 %	11.6-14.0 %
PDW	L 8.8 fL	11.0-16.0 fL
MPV	9.0 fL	6.0-11.0 fL
PCT	0.48 %	0.15-0.50 %
Neutrophil	72.5 %	40.0-80.0 %
Lymphocyte	22.2 %	20.0-40.0 %
Monocyte	0.9 %	2.0-10.0 %
Eosinophil	0.0 %	1.0-6.0 %
Basophil	0.0 %	0.0-2.0 %
Electrolytes		
Serum sodium	136.5mmol/L	137.0-145.0 mmol/L
Serum potassium	4.7mmol/L	3.5-5.1 mmol/L
Serum chloride	101.5 mmol/L	98.0 – 107.0 mmol/L
Renal function test		
Blood urea	59.2 mg/dl	15.0- 45 mg/dl
Creatinine	0.5 mg/dl	0.52-1.25 mg/dl
Serum uric acid	6.0 mg/dl	2.5-6.2 mg/dl
Liver function test		
Serum bilirubin total	1.5mg/dl	0.2-1.3 mg/dl
Serum bilirubin direct	0.1mg/dl	<0.3 mg/dl
Serum bilirubin indirect	0.9 mg/dl	0.1-0.9 mg/dl
SGOT/AST	33.4 U/L	15.0-46.0 U/L

SGPT/ALT	21.0 U/L	13.0-69.0 U/L
Serum alkaline phosphatase	86.2 U/L	38-126 U/L
Serum Total Proteins	L 4.2 g/dl	6.3-8.2 g/dl
Serum Albumin	3.3 g/dl	Adult :3.5-5.0 g/dl
Serum Globulin	3.9 g/dl	2.0-3.5 g/dl
A/G Ratio	1.2	1.2-2.5:1
PT/INR		
Prothrombin time	12.9 Sec	
INR	1.144	
Hepatitis C virus (antibodies)	Non reactive	
HIV 1 & 2 antibodies	Non reactive	
COVID-19 RT-PCR	Negative	
Hepatitis B surface antigen	Negative	

Table 1: Investigations of the patient

Final medical diagnosis: Viral fever, cough with no significant past comorbidity and family history.

Treatment prescribed

Medication	Dose	Mechanism of action
INJ PANTOP	40 mg	Antacid
TAB DOLO	650 mg	Painkiller
INJ EMSET	100 ml	Antiemetic
TAB ULGEL	500 ml	Antacid

Table 2: Medication prescribed

Nutrition care process

1. **Nutritional assessment:** It is based on anthropometric measurements, biochemical investigations, clinical signs and symptoms and 24 hrs. dietary recall. The patient's anthropometric measurements were taken as below (Table 3). The patient was found to be **morbidly obese** on the basis of anthropometric measurements.

a. Anthropometric measurements

Weight	110 Kg
Height	170 cm
Body mass index (BMI)	38.1 Kg/m ²

Adjusted ideal body weight (AIBW)	80 Kg
BMR	2240
Physical activity level	1.53

Table 3: Anthropometric measurements

- b. Biochemical reports showed lower haemoglobin levels and total protein content that were significant from the nutrition care point of view.
- c. Clinical signs and symptoms: No apparent clinical signs were noted except shortness of breath, that may be due to viral fever and obesity.
- d. Twenty-four-hour dietary recall: It has been shown in table 4. It was found that patient's energy intake was only 923 Kcal and protein intake was 32 g. His food intake was lower due to viral fever.

TIME	MEAL	MENU	HOUSEHOLD MEASURES
7AM	TEA TIME	TEA	1 CUP
		BREAD	2
12:00	LUNCH	CHAPATI	3 (40GM)
		URAD DAL	2 BOWLS
		BUTTER MILK	1 GLASS
5:00PM		TEA	1 CUP
7:30PM	DINNER	CHAPATI	3 (40GM)
		LAUKI VEG	1 BOWL
	Whole day	Oil/ ghee	3 tsp
	Whole day	Sugar	2 tsp

Table 4: Patient's 24 hrs. Home diet recall (IFCT, 2017) [4]

2. Nutritional diagnosis: Patient was found obese with decreased food intake due to viral fever as evidenced by anthropometric measurements and 24 hours home diet recall.

3. Nutrition intervention: A moderate calorie high protein immunity enhancing diet was recommended during hospitalization for the purpose of convalescence that was converted to low calorie low fat, high protein, high fibre diet with plenty of fluids at the time of discharge from the point of view of weight loss.

Goals of medical nutrition therapy

Short term goals: to maintain food intake for convalescence, to fulfil increased fluid requirements due to increased BMR in fever, to provide an easily digestible diet to aid in digestion.

Long term goal: To achieve and maintain ideal/ target body weight.

Energy - 1695 Kcal (Ideal body weight X 20 X 1.2 Stress factor)

Protein - 70 g

Carbohydrate - 291 g

Fat - 33.4 g

Sodium - 2000 mg-2500 mg

Potassium - 3500 mg

Fluid requirement - 2450 ml (35 ml/kg body weight)

NNC: N2 Ratio = 1393: 10.4 (139:1)

Consistency & meal frequency - Soft to full diet as per tolerance (3 major & 5 minor meals)
[5]

Following table 5 is showing patients average 3 day's diet recall during hospitalization.

	MENU	QUANTITY	CALORIE (Kcal)	PROTEIN (g)	CARB (g)	FAT (g)
DAY 1 SOFT DIET						
MORNING TEA	TEA SUGARFREE	100 ML	23	1.6	2.5	0.75
	BISCUIT	2	40	0.6	7.5	1.2
BREAKFAST	MILK	200 ML	92	6.4	10	3
	UPMA	200 G	68	2.4	14	0.3
MIDMEAL	SOUP	200 ML	51	2	10.4	0.1
LUNCH	KHICHRI	100 G	70	4	13	0.45
	DHULI MUNG DAL	100 G	86	6	15	0.6
EVENING TEA	MILK	200 ML	92	6.4	10	3
	BISCUIT	2	40	0.6	7.5	1.2
DINNER	DALIA (2)	400 G	136	4.8	28	0.6
	MUNG CHHILKA	100 G	86	6	15	0.6
	OIL	8 G	72	0	0	8
		TOTAL	856	40.8	132.9	19.8
DAY 2 FULL DIET						
MORNING TEA	TEA	100 ML	23	1.6	2.5	0.75
	BISCUIT	2	40	0.6	7.5	1.2
BREAKFAST	MILK	200 ML	92	6.4	10	3
	VEG DALIA	200 G	68	2.4	14	0.3
MIDMEAL	SOUP	200 ML	51	2	10.4	0.1
LUNCH	SALAD	200 G	34	1	6	0.2
	CHAPATI	4	400	14.4	84	2
	PALAK	100 G	86	6	15	0.6
	BITTER GOURD	100 G	51	2	10	0.1

EVENING TEA	TEA	100 ML	23	1.6	2.5	0.75
	BISCUIT	2	40	0.6	7.5	1.2
DINNER	SALAD	200 G	34	1	6	0.2
	CHAPATI	4	400	14.4	84	2
	MUNG DAL 2	200 G	172	12	30	1.2
	BHINDI VEG	100 G	51	2	10	0.1
	OIL	10 ML	90	0	0	10
	TOTAL		1655	68	299	23.7
DAY 3 FULL DIET						
MORN TEA	TEA	100 ML	23	1.6	2.5	0.75
	BISCUIT	2	40	0.6	7.5	1.2
BREAKFAST	MILK	200 ML	92	6.4	10	3
	VEG DALIA	200 G	68	2.4	14	0.3
MIDMEAL	SOUP	200 ML	51	2	10.4	0.1
LUNCH	SALAD	200 G	34	1	6	0.2
	CHAPATI	4	400	14.4	84	2
	PALAK	100 G	86	6	15	0.6
	BITTER GOURD	100 G	51	2	10	0.1
EVENING TEA	TEA	100 ML	23	1.6	2.5	0.75
	BISCUIT	2	40	0.6	7.5	1.2
DINNER	SALAD	200 G	34	1	6	0.2
	CHAPATI	4	400	14.4	84	2
	MUNG DAL 2	200 G	172	12	30	1.2
	BHINDI VEG	100 G	51	2	10	0.1
	OIL	10 ML	90	0	0	10
	TOTAL		1655	68	299	23.7

Table 5: Patient's 3 day's hospital diet

4. Monitoring and evaluation

	ENERGY (Kcal)	PROTEINS (g)	CARBS (g)	FAT (g)	NA (mg)	K (mg)
DAY 1	856	40.8	132.9	19.8	2377.5	1278
DAY 2	1655	68	299	23.7	2442.7	2564
DAY 3	1655	68	299	23.7	2442.7	2564
TOTAL	4166	176.8	730.9	67.3	7261	6404
AVERAGE	1388	58.9	243.6	22.4	2420	2135

%	81.88	84	83	67	100	61
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Table 6: Patient's average nutrient intake on the basis of three day's hospital diet

On the basis of patient's eating condition and recovery from viral infection at the time of discharge, his discharge diet was designed as below –

Diet	Energy	Protein	Carbs	Fat	Sodium	Potassium	NNC: N2
Low calorie, low fat high fibre diet	1600 Kcal	65 g	291 g	33.4 g	2000 - 2500 mg	3500 mg	134:01:00

Dietary recommendations:

- Eat high fibre foods such as whole grains, millets, pulses, raw fruits and vegetables, fenugreek, coconut, corn
- Avoid over eating
- Judicious purchasing of foods. Avoid high fat, sugar and salt foods
- Prefer home-made, roasted or steam cooked recipes
- Avoid fried foods
- Drink plenty of low-calorie fluids like green tea, black tea, lemon tea, lemon water, coconut water, chhach, vegetable soups etc.
- Be physically active. Exercise at least 150 min./ week

The Patient will be further reassessed on the basis of weight changes and diet compliance.

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