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Malnutrition levels among type-2 diabetes mellitus patients in Pakistani a multi center study

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Abstract---Objective: To determine the frequency of malnutrition among T2DM patients in tertiary care. Place and Duration of Study: Departments of Medicine Hayatabad medical complex peshawar Pakistan from jan 2020 to July 2021. Methodology: this Multi-center study conducted in department of medicine hmc hospital Peshawar from jan 2020 to July 2021. total of 130 T2DM patients were assessed for nutritional evaluation with the assistance of a nurse and supporting staff. With the use of a questionnaire and a Subjective Global Assessment form, the data was collected (SGA). With the aid of MS Excel and SPSS, the nutritional risk factors and malnutrition

status were determined, and the data was statistically examined. Results: The results of our recent study showed that, of the 130 patients, 62 48% were at intermediate risk of malnutrition and 68/52% were at high risk. Similar to this, 48 individuals had severe malnutrition, while 80 patients were classified as having moderate malnutrition. Obese Class-I, with the greatest risk of malnutrition and the highest frequency of severe malnutrition, has been proven to have the highest incidence among the different BMI categories. 0.920 is the correlation coefficient R2. The null hypothesis is disproved by the p-value (01.224e-39) and Chi-Square value of 185.70. Conclusion: According to the results of recent studies, it is possible to draw the conclusion that hospitalized patients with a healthy ratio of T2DM are at nutritional risk or have the status of malnutrition. Second, it may be predicted that Obese Class-I of the BMI distribution would have the highest incidence of T2DM.

Keywords---T2DM, malnutrition, BMI.

Introduction

As T2DM has spread internationally, the WHO and health care financing agencies have emphasized T2DM education and awareness. T2DM knowledge and diet and life style changes can control and prevent the disease[1]. Unbalanced diets cause malnutrition in healthy people. WHO defines malnutrition as a lack of micro- and macronutrients needed for daily nutrition. Malnutrition is under- and over-nutrition[2]. Many causes might cause nutrient loss or inadequate absorption, causing nutritional imbalance. Nutritional imbalance causes obesity, weight loss, infections, poor wound healing, muscular abnormalities, morbidities, and greater mortality. Malnutrition increases T2DM risk[3]. endocrine disease T2DM affects geriatrics and workers worldwide Most of T2DM patients with difficulties were over 6011 in earlier decades. According to patient histories, most T2DM hospitalized patients were malnourished or at risk[4,5]. Tried-and-true procedures may quickly detect nutritional deficiency. Physical, medical, laboratory, dietary, and anthropometric exams are standard[6]. ASPEN also recommends the SGA for nutritional assessment[7]. SGA metrics evaluate nutritional status. Lifestyle may imply malnutrition or morbidity in the patient's history. SGA classifies patients into three groups: Group A (Well-nourished), Group B (Moderately/Mildly malnourished), and Group C (Severely malnourished) [8]. Given the issues and relevance of nutrition assessment and management, hospitals and communities cannot restrict dieticians from performing nutritional evaluations. This study examines T2DM patients' malnutrition rates in Peshawar, Khyber Pakhtunkhwa's Hmc Hospita[9].

Materials and Methods

This Multi Center Study involving patients with T2DM in Departments of Medicine Hayatabad medical complex Peshawar Pakistan from jan 2020 to july 2021.

Inclusion Criteria

- Patients who have been hospitalized within the past 24 to 72 hours and are at least 15 years old.
- The patient was identified as having T2DM in accordance with the American Diabetes Association's (ADA) diagnostic criteria.

Exclusion

- T2DM newly discovered at the time of admission.
- Patients who have a history of using long-term glucose-metabolizing medications, such as beta-adrenergic agonists and steroids.
- Patients who are experiencing diabetic ketoacidosis for the first time.
- Patients with long-term surgical or medical problems, such as post-pancreatectomy, acromegaly, Cushing syndrome may affect glucose metabolism.

Nurses and colleagues assessed T2DM patients' diets. Patients agreed to nutritional assessments. Questionnaires collected data. The clinical profile of each patient included T2DM duration, age, gender, smoking, family history of DM, medication use (insulin or oral hypoglycemics), HbA1C, diabetic complications, and previous medical history of cardiovascular disease, hypertension, stroke, chronic kidney disease, foot ulcers, and hyperlipidemia. Anorexia, food intake, weight, and gastrointestinal function also changed. Functional capability (dysfunction to bedridden) was identified. Triceps, biceps, temple, scapula, clavicle, knee, shoulder, calf, and shin also lost fat. Edema was also noted. SGA patients were classified as A (well-nourished), B (moderately malnourished), or C. (severely malnourished). BMI, total lymphocytes, and albumin estimated nutritional risk. These tests determined patients' nutritional hazards.

Statistical Analysis

(SPSS) version 28 was used to evaluate the data gathered for the evaluation of nutritional status. With the use of SPSS, the standard error means and P-values were computed. Microsoft Excel was used to calculate the correlation coefficient. With the aid of SPSS, the Chi-Square distribution analysis was completed.

Results

Table 01 shows age, weight, height, and BMI. Patients were 25–90 years old and 42–102 kg. Patients' BMIs ranged from 15 to 48 and their heights from 125 to 190 cm. 130 patients averaged 65 years old and 50 kg. The average BMI was 31.39, as the average height was 155 cm. Type-II diabetes patients comprised 57 females (43% of the total) and 73 males (57%). Table 02 shows the gender distribution of patients (Table 02).

Table 1
Patient Parameters for Type-II Diabetes Mellitus-(N-130)

S. No	Parameters	Mean ± SEM	Mode
01	[Age]	58.02 ± 03.70	61
02	[Weight]	65.88 ± 04.21	58
03	[Height]	161.38 ± 09.16	155
04	[BMI]	25.18 ± 01.61	29.37

The data is shown as Mean Standard Error. Mean

Table 2
Frequency and percentage of Male and female Type II Diabetes Mellitus-(N-130)

S. No	Gender	Number	Percent
01	Male	73	57
02	Female	57	43
Total	---	130	100

Table 03 presents group BMI data. 65 individuals are Obese Class-I. 03 patients are underweight. 37 men and 26 women were obese Class-I. Most insulin-dependent and oral hypoglycemic medicine users were obese Class-I.Table 04 outlines dietary risk factors. 61 of 130 patients were moderately at risk of dietary deficiency, while 68 were at high risk. All patients' nutritional risk markers—SGA, TLC, and Albumin—were measured. SGA-C included 21 moderate-risk and 64 high-risk people, whereas SGA-A had none. 11 individuals had extremely low TLC counts (<900 per µl) and were at high risk of nutritional deficiency. 23 moderate-risk and 21 high-risk individuals had TLC counts >1500 per µl. The Albumin group with [<2.5 g/dl] had the most patients, 26 at moderate risk and 18 at high risk.

Table 3
Data on the different BMI categories-(N-130)

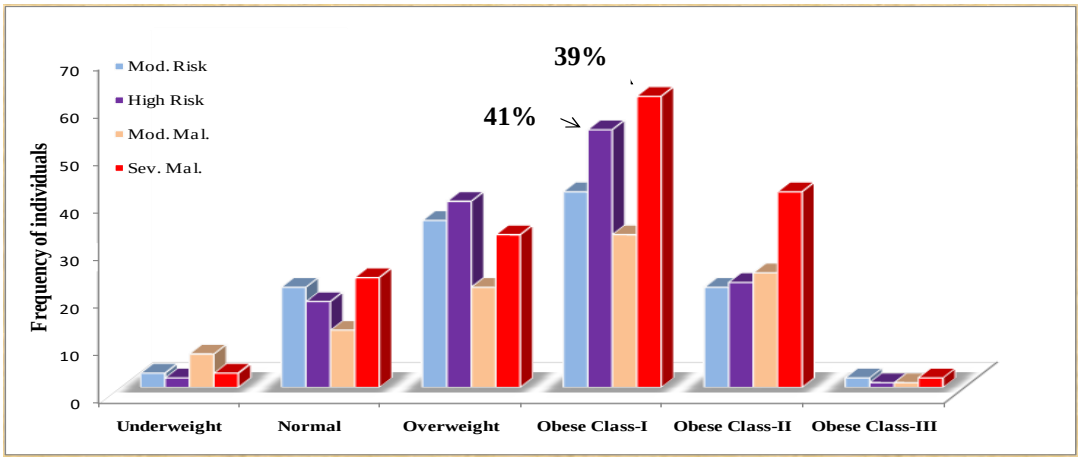
S. No	Parameters	Underweight [<18.4]	Normal [18.05-22.05	Overweight [22.06-22.96	Obese Class-I 23-27.97	Obese Class-II 29-38.97	Obese Class-III ≥45
01	Frequency	03	06	23	65	31	03
02	Male	02	04	13	38	15	01
03	Female	02	02	10	26	17	02
04	Insulin	02	04	10	27	12	01
05	Oral	01	03	12	37	19	02

Table 4
Amount of Nutritional Risk Frequency-(N-130)

S. No	[Nutritional] Risk		[SGA]			[TLC per µl]			[Albumin g/dl]		
			A	B	C	<900	900-1500	>1500	<2.5	2.5-3.4	>3.4
01	[Moderate]	62	0	41	21	0	16	46	26	21	15
02	[High]	68	0	04	62	11	29	43	36	26	08

Total Lymphocyte Count; SGA: Subjective Global Assessment

Figure 01 shows malnourished or at-risk individuals. Obese Class-I bars show that 41% and 39% of people are very malnourished and high risk. The fewest patients were Class-III obese and underweight. Figure 01 demonstrates that moderate risk and moderate malnutrition were almost less common than high risk and severe malnutrition in every BMI group. Obese Class-I patients have greater nutritional risk and malnutrition. 3



Sev.Mal: Severe Malnutrition; Mod.Mal: Moderate Malnutrition
Figure 1. prevalence of at-risk or malnourished individuals in various BMI groups-(N-130)

Figure 02 details the correlation between the prevalence of men and women in various BMI groups. A strong association between the frequency of male and female is shown by the data's slope (y = 0.695x + 02.014). The substantial connection between the two variables is shown by the R2 value of 0.925.

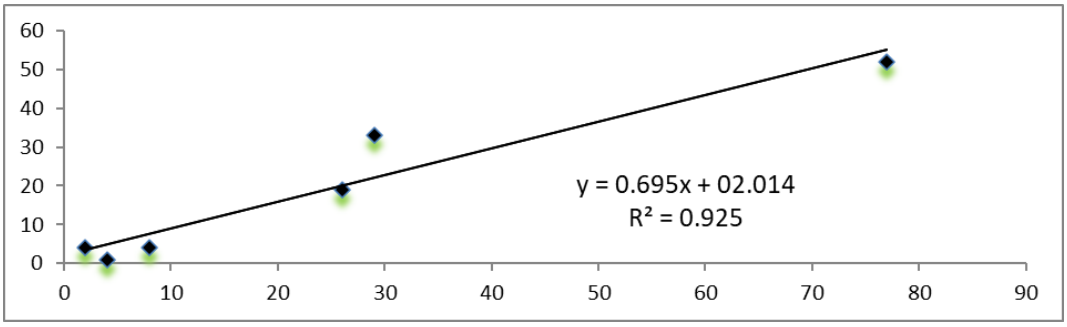


Figure 2. Correlation of Frequency of Male Vs Female in various BMI Categories

Table 05 details the Type-II Diabetes Mellitus diet. 48 had severe malnutrition, 81 moderate. 34 severe and 70 moderate malnourished individuals failed to lose weight. No slightly underweight patient lost above 11%. Oral feeding decreased somewhat in most Table 05 patients. Most had mild GIT symptoms. Most Diabetes Mellitus patients are dysfunctional/suboptimal bedridden, with 57 moderately malnourished and 06 severely malnourished. The physical examination revealed 04 moderately malnourished individuals and 2 severely malnourished patients.

Table 5
Clinical data of various patients showing malnutrition severity

S. No	Parameters	Level	Moderate Malnutrition 81	Severe Malnutrition 48
1	Weight Loss	None	70	34
		≤10%	12	09
		>10%	01	06
2	Reduction of Oral Nutrition	Little/None	55	26
		Sub-optimal	26	21
		Starvation for > 5 days	0	02
3	GIT symptoms	None	71	42
		Nausea	06	04
		Vomiting/diarrhea	04	03
4	Functional Capacity	No Change	21	40
		Dysfunction/ Sub-optimal Bed ridden	60	06
		Bed Ridden for >2 weeks	01	03
5	Physical Examination	None/ Little Depletion	70	44
		Moderate Depletion	06	03
		Severe depletion	01	01
6	Edema/ Ascite	None	75	40
		Moderate	04	07
		Severe	03	02

Total Lymphocyte Count; SGA: Subjective Global Assessment

Discussion

Life has improved due to urbanization. Urban life's difficulties have sedentaryized the very active20. Sedentary lifestyles, dirty food, air, and water increase morbidity[10]. T2DM22 is serious. Humanity has suffered from T2DM. Our observations supported numerous essential facts. Size matters. Several Obese Class-I patients had BMI 25-29.99 kg/m2. Height and BMI raise T2DM23 risk[11]. Nutrition dictates this. Nutritional demands exceeding intake causes morbidity, including T2DM[12]. 48% (123) of 130 T2DM patients had intermediate risk of malnutrition and 52% (136) were high risk. Malnutrition affected all T2DM patients. Non-diabetics are less malnourished[13]. A recent study revealed 37% of T2DM patients were malnourished and 63% at risk The mean age of 130 T2DM patients was 60.01 ± 3.72, and the modal age was 63[14]. Older adults are more prone to have the condition. Numerous studies link age and BMI 26 to T2DM[15].162 patients had moderate malnutrition, 62.55% of the population, and 97 had severe malnutrition, 37.45%. In Table 05, all traits are common in the first group[16]. 139 moderate and 68 severe malnourished have not lost weight. 23 moderate and 17 severe malnourished individuals lost less than 10% of their weight. The >10% group had no intermediate malnutrition and 12 severe cases. Weight reduction improves T2DM27-28. Few patients lost weight. Oral feeding reduces GIT symptoms[17]. Table 05 demonstrates significant functional deterioration. 117 intermediate malnutrition patients and 8 severe patients were bedridden/dysfunctional. Functionality lowers T2DM symptoms[18].

Conclusion

According to the results of recent studies, it is possible to draw the conclusion that hospitalized patients with a healthy ratio of T2DM are at nutritional risk or have the status of malnutrition. Second, it may be deduced that the highest prevalence of T2DM might be found in the Obese Class-I of the BMI distribution, where individuals with malnutrition are more likely to occur.

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