Research Article

iMedPub Journals
www.imedpub.com

Journal of Clinical Nutrition & Dietetics
ISSN 2472-1921

2022
Vol.8 No.S1:1000003

Nutritional Status Assessment of Patients Recovered From Coronavirus Disease (COVID-19)

Manjeet Singh[1*], Rashmi Kulkarni[2], Pawan Kumar Singh[3], Kasthuri Rangarajan[4], Anik Chakraborty[5] and Daksh Yadav[1]

[1]Department of Medicine and Surgery, Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India

[2]Department of Quality Management, Sri Aurobindo Medical Science and Post Graduate Institute, Indore, Madhya Pradesh, India

[3]Department of Pulmonary and Critical Care Medicine, Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana

[4]Department of Healthcare, National Accreditation Board for Hospitals (NABH), Chennai, India

[5]Department of Community Medicine, Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India

Corresponding author: Manjeet Singh, Department of Medicine and Surgery, Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India, E-mail: mjetsingh@gmail.com

Received: 19-Aug-2022, Manuscript No. IPJCND-22-14355; **Editor assigned:** 22-Aug-2022, PreQC No. IPJCND-22- 14355(PQ); **Reviewed:** 05-Sep-2022, QC No IPJCND-22-14355; **Revised:** 12-Sep-2022, Manuscript No. IPJCND-22-14355(R); **Published:** 19-Sep-2022,10.36648/2472-1921.8.S1.0003

Citation: Singh M, Kulkarni R, Singh PK, Rangarajan K, Chakraborty A, et al. (2022) Nutritional Status Assessment of Patients Recovered From Coronavirus Disease (COVID-19). J Clin Nutr Diet Vol. 8 No. S1:03

Abstract

Background and aim: COVID-19 infection has a number of harmful effects on one's nutritional state. We did a prospective observational study to give a scientific evaluation of COVID-19's impact on nutritional research. This study, to our knowledge, will be extremely useful in determining the nutritional status of COVID-19-positive patients.

Methods: 282 patients were included in the prospective observational study. Socio-demographic profile, BMI, and other anthropometric measurements were assessed. Mini Nutritional Assessment scale was used which consisted series of 18 questions. Cut-off points :< 17 points (malnutrition), 17-23.5 points (risk of malnutrition) and 24-30 points (non-malnutrition) were considered.

Results: 112 men and 170 women were included with a median age of 32 (IQR 25.0–46.0). The average MNA score across the population was 20.5 (SD ± 3.7). According to the data, 21.3% (n=60) were malnourished, 62.7% (n=177) were at risk of malnutrition and 16% (n=45) were adequately nourished. The average BMI was 23.3 kg/m^2, and 39.1% of patients experienced weight loss.

Conclusions: Malnutrition was highly prevalent in patients who recovered from COVID-19. Food intake was reduced in patients recovering from COVID-19. We must implement better strategies to improve the nutritional status of all classes of society for a better prognosis of COVID-19 infection.

Keywords: COVID-19; Malnutrition; Nutritional status

Introduction

Coronavirus Disease 2019 (COVID-19) is an ongoing pandemic outbreak leading to deaths worldwide. Furthermore, SARS-CoV-2 can attack the mucous epithelium and cause gastrointestinal symptoms, further impairing the nutritional status [1]. COVID-19 illness negatively impacts nutritional status on many levels; increasing nutritional requirements induced by pyrexia, sepsis, dyspnoea, and reducing nutritional intake due to excessive coughing, dysphagia, dysgeusia, chronic fatigue, poor appetite, and food access issues [2]. Various studies have been conducted to identify themes regarding the importance of nutritional care, as they are fundamental and should be integrated into pathways for the rehabilitation of patients recovering from COVID-19. To provide a scientific evaluation of the impact of COVID-19 on the nutritional study, we conducted a prospective observational study. To our knowledge, this study will immensely help assess the nutritional status of COVID-19-positive patients.

It can evolve into pneumonia requiring hospitalization up to severe Acute Respiratory Distress Syndrome (ARDS) managed in the Intensive Care Unit (ICU). Infectious respiratory diseases lead to malnutrition, which can worsen the prognosis. In the COVID-19 population, studies have reported that about half of the patients describe olfactory and gustatory dysfunction. These disorders may contribute to a reduction in nutritional intake. Li et al. showed a high prevalence of malnutrition (52.7%) in a cohort of 182 elderly patients with COVID-19 [3]. Our study aimed to evaluate the prevalence of malnutrition in patients hospitalized for COVID-19.

© Copyright iMedPub | This article is available from:

Materials and Methods

Subjects

This Prospective observational study was performed on COVID-19-positive patients under follow-up in a Tertiary Care Teaching Hospital in North India. All patients were confirmed by nasal Polymerase Chain Reaction (PCR) and/or COVID-19 pneumonia criteria on chest Computed Tomography (CT).

Ineligibility criteria included patients with a significant pre-existing disease with hypoprotidemia (uncontrolled cirrhosis, nephrotic syndrome), patients established on Home Enteral Nutrition (HEN) or Parenteral Nutrition (PN) in an acute setting (e.g., hospitalized). Overall, 282 patients were included in the analysis. The institutional Biomedical Research Ethics Committee approved this study. Written informed consent was obtained from all subjects. Eligibility criteria were as follows: (1) age > 18 years, (2) SARS-CoV-2 pneumonia (confirmed by RT-PCR, (3) hospitalization in wards or ICU, (4) without end-of-life decisions.

Study period: Data was collected over a period of 6 months that is from May 2021 to October 2021.

Demographics, comorbidities, and laboratory values: Patient details were extracted from the records of the COVID-19 control center of the tertiary healthcare center, and these patients who tested positive were the eligible participants; they were called up for enrolment to record the data.

Eligible participants will be enrolled consecutively in the study. The demographic profile was recorded in the Case Record Form generated by Google forms online in terms of age, gender, residence, contact information, and symptoms experienced (Cold, Fever, Cough, Shortness of breath, Headache, Muscle pain, Sore throat, Diarrhoea, Olfactory disorders, Taste disorders, Exhaustion, Body ache, Weakness) [4,5].

History of chronic illness was noted along with the medication or treatment being administered to the patient. Pregnancy status and stage of gestation was asked. Smoking and alcohol intake information was collected. Blood test reports were extracted from records or discharge sheets, including inflammatory markers, D-dimer, albumin, and blood count (hemoglobin and lymphocyte count). Radiological findings were also extracted from the discharge sheet.

Socio-demographic pro ile: The socio-demographic profile will be assessed using the modified Kuppuswany Scale [4], and other parameters like the location of residence and the number of people living in house to the ratio of room available in house were asked.

Anthropometric measurement: BMI and other anthropometric measurements and measured as per the standard measurement guidelines [6]. Body height (± 0.1 cm) and weight (± 0.1 kg) in light indoor clothing were measured. Body mass index (kg/m^2) was calculated. The average of left and right-side measurements was considered for analysis for mid-arm circumference, triceps skin-fold thickness, and calf circumference.

Nutritional assessment: Mini Nutritional Assessment scale, which consisted of 18 questions, was used. Questionnaire assessments were completed through face-to-face interviews and were performed by the staff trained well in formal nutrition surveys. Nutritional status was assessed considering the following cut-off points:<17 points (malnutrition), 17-23.5 points (risk of malnutrition), and 24-30 points (non-malnutrition).

Statistical analysis: Continuous variables were expressed as mean ± SD. Categorical variables were expressed as absolute values and percentages.

Results

112 men and 170 women were included, with a median age of 32 (IQR 25.0–46.0) years. The average MNA score across the population was 20.5 (SD ± 3.7). According to the data, 21.5% (n=60) were malnourished, 62.5% (n=177) were at risk of malnutrition and 15.9% (n=45) were adequately nourished. The average BMI was 23.3 kg/m^2 and 39.1% of patients experienced weight loss. The basic demographic, comorbidities, anthropometry, and laboratory values of all enrolled patients showed in **Table 1.**

Clinical features	
Characteristics	
Gender (%)	
Male	39.7
Female	60.3
Age (in years)	36.4 (SD ± 15.8)
Geographic Area (%)	
Rural	16.7 (n=47)

This article is available from:

Urban	73.7 (n=208)
Semi-urban	9.6 (n=27)
Body Mass Index (BMI) (kg/m^2)	23.3(SD ± 3.5)
Mid-Arm Circumference	
MAC less than 21 (%)	6 (n=17)
MAC 21 to 22 (%)	58.5 (n=165)
MAC greater than 22 (%)	35.5 (n=100)
Calf circumference (cm)	
CC less than 31	51.7 (n=146)
CC 31 or greater	48.2 (n=136)
m-Kuppuswamy score	19.7 (SD ± 6.7)
MNA Score (%)	
Normal nutritional status (24-30)	21.2 (n=60)
Risk of malnutrition (17-23.5)	62.5 (n=177)
Malnourished (<17)	15.9 (n=45)
Elevated inflammatory markers (%)	32.6 (n=92)
Lymphopenia confirmed (%)	18.8 (n=53)
RT-PCR confirmed (%)	97.8 (n=276)
Weight loss during the last 3 months (%)	
Weight loss greater than 3kg (6.6lbs)	3.5 (n=10)
Does not know the amount of weight loss	22.7 (n=64)
Weight loss between 1 and 3 kg (2.2 and 6.6 lbs)	12.8 (n=36)
No weight loss	60.9 (n=172)

Table 1: Clinical features and characteristics of enrolled patients.

Discussion

At the end of 2019, a new coronavirus called SARS-CoV-2 appeared in Wuhan, China. It was responsible for the emergence of a new acute respiratory infection now known as "COVID-19". It was declared a pandemic by the World Health Organization (WHO) on March 11, 2020 [7]. The present study aimed to assess nutritional status in patients who recovered from Coronavirus Disease (COVID-19) using a nutritional assessment tool that can further impart practical and clinical indications for managing patients suffering from nutritional deficiency after recovering from COVID-19.

Our study has shown that malnutrition was highly prevalent in patients who recovered from COVID-19. Based on low BMI and/or weight loss, Malnutrition was present in 39.1% of patients. On the Mini Nutritional Assessment scale, malnutrition risk was moderate in 62.5% and severe in 21.2% of patients. Furthermore, we also assessed those patients who suffered serious COVID-19 and had severe malnutrition. The European Society of Enteral and Parenteral Nutrition (ESPEN) recommended management of COVID-19 patients for prevention, diagnosis and treatment of malnutrition to improve short- and long-term prognoses [8]. However, studies available with us have significantly focused only on hospitalized patients

© Copyright iMedPub

or those critically ill. Our study included participants with a larger spectrum of disease severity and a broader population range which may have implications for improving nutritional status and thereby immune functioning and consequently reducing the risk for COVID-19 infection.

The incidence of malnutrition in patients with COVID19 was higher. One of the reasons is that the acute inflammatory response of neo-coronavirus infection consumes the protein that makes up muscles. C-reactive protein, ferritin, tumor necrosis factor-alpha, interleukin family factors, etc., were the inflammatory indicators that were generally increased. [8]. The synthesis of these acute-phase proteins required the consumption of albumin and even muscle protein [9]. This explanation is congruous with the observations of our study as the patient's calf circumference, and albumin levels were significantly lower. Similarly, hypoalbuminemia and low calf circumference were commonly used as important indicators for evaluating malnutrition [10,11]. Gastrointestinal symptoms caused by SARS-CoV-2 exacerbated malnutrition in patients. Angiotensin-converting enzyme 2 was also highly expressed in the gastrointestinal track [12]. So, the gastrointestinal tract was also the main target of SARS-CoV-2 attack [13,14]. Diarrhoea, mild abdominal pain, nausea, vomiting, poor appetite, and other symptoms were widespread [15]. The involvement of the digestive tract had accelerated the occurrence of malnutrition in patients with COVID-19. It was also observed that most of patients suffered symptoms of anxiety due to fear of COVID-19 infection spread which resulted in the poor appetite of the patients which was also related to the patient's anxiety [16].

Blessedly, the number of COVID-19 cases has decreased in India, but when the data was being collected, a lot of cases and healthcare workers were dealing with work overload. Due to this reason, we were not able to record some of the baseline data for some patients. Our study didn't include patients who were critically ill or lost their lives due to COVID-19. We were not able to follow up and assess the treatment provided to patients suffering from severe malnutrition, whom we referred to a physician or dietician.

Conclusion

In our population, 62.5% were at risk of malnutrition and about 21.2% had severe nutritional risk. It was observed that due to pathological and psychological reasons, food intake was reduced in patients recovering from COVID-19. We need to implement better strategies to improve the nutritional status of all classes of society for a better prognosis of COVID-19 infection.

Ethical approval

An institutional ethical approval was obtained before the commencement of the study (BREC/21/66; dated 20.08.2021).

Declaration of interest

No financial or nonfinancial benefits have been received or will be received from any party related directly or indirectly to the subject of this article

Acknowledgment

The authors thank Dr. Ramesh Verma and the Department of Community Medicine, Pt B D Sharma Postgraduate Institute of Medical Sciences, Rohtak, Haryana, for helping to assess data statistics in the project.

Funding

There was no funding involved in the research

Author contribution

MS, RK, SKR: Concept and design of the study; MS, RK, AC, DY, PKS: data collection, analysis, and interpretation of data, MS, RS: drafting the manuscript and review of literature; MS: Clinician-in-charge, critical review of the manuscript for intellectual content, final approval of the version to be published and will act as guarantor for the paper. All authors approve of the final version.

REFERENCES

1. Li T, Zhang Y, Gong C, Wang J, Liu B, et al (2020). Prevalence of malnutrition and analysis of related factors in elderly patients with COVID-19 in Wuhan, China. Eur J Clin Nutr, 74:871-875.
2. Rouget A, Vardon-Bounes F, Lorber P, Vavasseur A, Marion O et al. (2020). Prevalence of malnutrition in COVID-19 inpatients: the Nutricov study. Br J Nutr, 126:1296-1303.
3. Wani RT (2019) Socioeconomic status scales-modified Kuppuswamy and Udai Pareekh's scale updated for 2019. J Family Med Prim Care, 8:1846-1849.
4. Cawood AL, Walters ER, Smith TR, Sipaul RH, Stratton RJ et al. (2020) A Review of Nutrition Support Guidelines for Individuals with or Recovering from COVID-19 in the Community. Nutrients, 12:3230.
5. Link of form: https://forms.gle/vDkhH7K456iUzesm9
6. Status WP (1995) The use and interpretation of anthropometry. World Health Organ Tech Rep Ser, 9: 1-452.
7. Zhu N, Zhang D, Wang W, Li X, Yang B et al. (2020) A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med 2020; 382:727-733.
8. Barazzoni R, Bischoff SC, Breda J, Wickramasinghe K, Krznaric Z et al. (2020) ESPEN expert statements and practical guidance for nutritional management of individuals with SARS-CoV-2 infection. Clin Nutr, 39: 1631-1638.
9. Jia H (2016) Pulmonary angiotensin-converting enzyme 2 (ACE2) and inflammatory lung disease. Shock, 46: 239-248.
10. Ohwada H, Nakayama T, Kanaya Y, Tanaka Y (2017) Serum albumin levels and their correlates among individuals with motor disorders at five institutions in Japan. Nutr Res Pract, 11: 57-63.

11. Maeda K, Koga T, Nasu T, Takaki M, Akagi J et al. (2017). Predictive accuracy of calf circumference measurements to detect decreased skeletal muscle mass and European Society for Clinical Nutrition and Metabolism-defined malnutrition in hospitalized older patients. Ann Nutr Metab 71: 10-15.
12. Hamming I, Timens W, Bulthuis MLC, Lely AT, Navis GJ et al. (2004). Tissue distribution of ACE2 protein, the functional receptor for SARS coronavirus. A first step in understanding SARS pathogenesis. J Pathol 203: 631-637.
13. Duarte R, Furtado I, Sousa L, Carvalho CFA (2020) The 2019 novel coronavirus (2019-nCoV): Novel virus, old challenges . Acta Med Port, 33: 155-157.
14. Kuhn JH, Li W, Choe H, Farzan M (2004) Angiotensin-converting enzyme 2: A functional receptor for SARS coronavirus. Nature, 61: 2738-2743.
15. Alhazzani W, Møller MH, Arabi YM, Loeb M, Gong MN et al. (2020) Surviving Sepsis Campaign: guidelines on the management of critically ill adults with Coronavirus Disease 2019 (COVID-19). Intensive Care Med, 46:854-887.
16. Mattar L, Huas C, Duclos J, Apfel A, Godart N (2011) Relationship between malnutrition and depression or anxiety in Anorexia Nervosa: a critical review of the literature. J Affect Disord, 132: 311-318.

© Copyright iMedPub