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Original Research Article

A CROSS SECTIONAL STUDY TO ASSESS THE NUTRITIONAL STATUS AMONG POST COVID PATIENTS IN A TERTIARY CARE CENTER AT KANYAKUMARI DISTRICT

M.S. Praythiesh Bruce[1], K.U. Suresh Balan[2], Gopal[3], Logaguru[4], Kiruthiga[5],Rajasree[6]

[1]PhD (Part time) student, Shri Sathya Sai Medical College and Research Institute, Affiliation to Sri Balaji Vidyapeeth (SBV) (Deemed to be University) Ammapettai, Chengalpet District, Tamil Nadu, India.,Tutor Department of Community Medicine Kanyakumari Government Medical College Asaripallam,India[1]
[2]Professor and Head, Department of Community Medicine, Kanyakumari Government Medical College, Asaripallam, India.
[3]Associate Professor, Department of Community Medicine, Kanyakumari Government Medical College, Asaripallam, India.
[4,5,6]CRMI, Department of Community Medicine, Kanyakumari Government Medical College, Asaripallam, India.

Abstract

Background: Nutritional status of the population is an important public health issue which is often neglected. Both under nutrition and over nutrition are public health priorities. The aim of our study is to assess the nutritional status of patients who recovered from COVID-19 and were admitted in ward and intensive care unit. **Materials and Methods:** A comparative hospital based cross-sectional study was done among 106 post COVID patients attending the Post COVID clinic of Kanyakumari Government Medical College, Asaripallam, who were discharged from COVID wards or ICU 2 weeks prior to the clinic visit, to assess their nutritional status. A systematic random sampling was adopted to select the study subjects and data was collected using a Modified Mini Nutritional Assessment Questionnaire. **Result:** The Mean age and standard deviation of the participants were 44.5 ± 15.380 and the mean BMI and standard deviation of the participants were 24.79 ± 3.70. Among the post COVID previously admitted in COVID ward and COVID ICU, majority (70.75%) were having a normal nutritional status and only 4.7 % were malnourished. When the nutritional status of the patients admitted in ICU and wards were compared, none of the patients admitted in ward were having malnutrition when compared to 25% admitted in ICU. **Conclusion:** The nutritional status assessment of the post COVID patients revealed that only 4.7 % were malnourished. And among those who were malnourished most of them were admitted previously in COVID ICU compared to wards.

INTRODUCTION

Health of an individual is contributed by many factors and one of the most important factors among them is nutrition. The nutritional status of an individual is influenced by certain aspects and malnutrition is an important area of concern which is often neglected. The infection - malnutrition cycle affects the productivity of an individual leading to economic devastation of the country as a whole making it an important public health priority.[1] The COVID 19 pandemic caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) which has spread rapidly around the world during 2020 made the situation worse.[2] The clinical manifestations of the disease varied widely, ranging from asymptomatic forms to severe acute respiratory distress syndrome (ARDS) requiring hospitalization, assisted ventilation, and intensive care unit (ICU) admission, with high mortality risk.[3] The nutritional status of individuals post admission varied drastically from the pre-admission state. The overall prevalence of malnutrition was 42.1% (moderate: 23.7%, severe: 18.4%).[4] The prevalence of malnutrition reached upto 66.7% among patients admitted in ICU.[5] On the other side, an individual who is already malnourished, is more vulnerable for COVID 19 and when the person contracts the disease, it leads to severe complications.[6] Early detection of malnutrition may mitigate COVID-19 associated malnutrition and helps in fast recovery.[7] Prolonged

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ICU stay, associated comorbidities, and older age are factors that causes high risk and incidence of malnutrition.[8] In patients with severe COVID-19 hyper inflammation with massive release of inflammatory cytokines, as well as use of mechanical ventilation, either non-invasive or invasive, and prolonged hospital stay could further increase the risk of malnutrition.[9] Patients with even mild COVID-19 managed at home might also suffer from malnutrition as, alterations of smell and taste, as well as fatigue and lack of appetite, are reported as very prevalent symptoms among COVID-19 patients that could affect food intake.[10] Confinement at home may limit the amount of physical activity, leading to loss of lean mass.[11] These factors, on top of a systemic inflammatory response, might result in malnutrition even in non-hospitalised patients. Under nutrition also influences the efficacy or tolerance of several key treatments such as antibiotic therapy, chemotherapy, radiotherapy etc. Understanding the prevalence of malnutrition among the patients discharged from COVID wards and ICU may help in adopting strategies which include improving nutrition as a key strategy which can reduce the intensity of COVID 19 associated malnutrition and make the recovery more earlier.[12-16]

Aim and Objectives

To assess the nutritional status of post COVID patients attending the Post COVID clinic in a tertiary care centre at Kanyakumari District and to compare the nutritional status of patients admitted in COVID wards and COVID Intensive Care Unit after 2 weeks from discharge.

MATERIALS AND METHODS

A cross sectional study was conducted among Post COVID patients discharged from COVID wards and Intensive care units of Kanyakumari Government Medical College from 1st February to 30thJune 2021.The study was conducted after getting approval from the Human Ethics Committee (No:F-003/IEC/2022) of the same institution. Only adults (>18 years)with confirmed diagnosis of COVID 19 and those who gave consent were included in the study. Pregnant patients and those with chronic illnesses were excluded. The informants were post COVID patients or relatives or bystanders. The sample size was scientifically calculated to be 106 based on the prevalence obtained from pilot study.

Sample size (n) = (Zα/2)2 p q = 96

d2

Zα/2= 1.96

p = 50%

q = 100-50 =50%

d= 20 %

With 10% non-response rate, sample size is calculated to be106. The study subjects were selected using Systematic random sampling method. A pre designed pre tested semi structured modified mini nutritional assessment questionnaire with scoring system as 24-30 points for 'normal nutritional status', 17-23.9 for 'at risk of malnutrition' and less than 17 for 'malnourished' were used for data collection. The study subjects were approached during their follow up visit in the Post COVID Clinic after two weeks from discharge date. Data was collected after getting written informed consent form the study subjects. Privacy and confidentiality were maintained throughout the conduct of the study. The collected data was entered into MS excel and was analysed using SPSS version 26.0. The quantitative data is expressed in means and standard deviations and qualitative data as percentages.

RESULTS

The total number of participants in this study were 106 and 52% of them were males and the rest were females. The Mean age and standard deviation of the participants were 44.5 ± 15.380, the Mean weight and standard deviation of the participants were 64.1 ± 10.28, the Mean height and standard deviation of the participants were 160.79 ± 4.60 and the mean BMI and standard deviation of the participants were 24.79 ± 3.70. [Table 1]

Among the male study participants, the Mean age and SD were 46.81 ± 16.05, the Mean weight and SD were 65.4 ±11.37, the Mean height and SD were 162.5 ± 4.662 and the Mean BMI and SD were 24.71 ± 3.75. Among the 50 female participants, the Mean age and SD were 42.06 ± 15.380, the Mean weight and SD were 62.6 ± 8.81, the Mean height and SD were 158.84 ± 3.68 and the Mean BMI and SD were 24.88 ± 3.69. [Table 1]
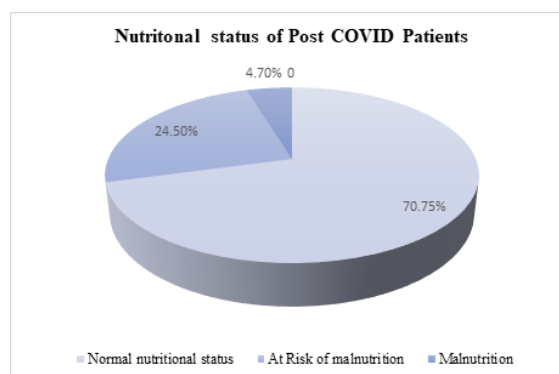

Figure 1: Nutritional status of post COVID patients who attended the Post COVID Clinic after 2 weeks from discharge date (n=106)

The nutritional status assessment done 2 weeks after discharge among the post COVID previously admitted in COVID ward and COVID ICU patients revealed that, majority (70.75%) were having a normal nutritional status and only 4.7 % were malnourished. [Figure 1]

Among the 106 study subjects, 70.75% participants were having a normal nutritional status and among them majority (56%) were males. The Mean age and SD of the study subjects with normal nutrition were

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39.9 ± 13.32, the mean weight and SD were 65.02 ± 10.18, the mean height and SD among them were 160.94 ± 4.64 and the mean BMI and SD among them were 25.07 ± 3.48. [Table 2]

Among the 106 participants,4.7% were malnourished and the majority of them were females(n=3). The Mean age and SD among the participants were70.8 ± 9.85, the Mean weight and SD were 62.4 ± 7.403, the Mean height and SD were 156.2 ± 2.28 and the Mean BMI and SD were 25.61 ± 3.30.

Among the 106 participants, 24.5% were at risk of malnutrition. More than half (53.8%) of them were females and the rest were males. The mean age and SD among the people at risk of malnutrition were 52.73 ± 15.42, the mean weight and SD among them were 61.8 ± 11.1, the mean height and SD were 161.23 ± 4.44 and the mean BMI and SD were 23.82 ± 4.47. [Table 4]

Among the study participants, less than a quarter (22.6%) was admitted in COVIDICU and the rest were admitted in COVID ward. Among the patients admitted in ICU and ward, majority (54.1% and 53.1%, respectively) were males. The Mean age of the study subjects admitted in ICU patients was 63.75 and that of patients admitted in ward was 38.86. The mean BMI among the patients admitted in ICU and Wards were 24.59 and 24.85 respectively. [Table 5]
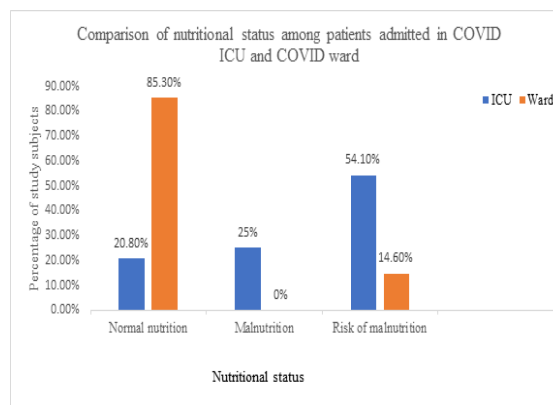

Figure 2: Nutritional status of patients admitted previously in COVID ICU and ward.

When the nutritional status of the patients admitted in ICU and wards were compared,85.3% of the patients admitted in COVID ward had normal nutritional status when compared to 20.80% admitted in COVID ICU. Among patients admitted in ward, none of them were having malnutrition when compared to 25% admitted in ICU, and among ICU admitted patients, 54.1% were at risk of malnutrition compared to 14.6% admitted in wards. [Figure 2]

Table 1: Gender wise distribution of anthropometric parameters among the study subjects

Parameter	Males (n=56) Mean (SD)	Females (n=50) Mean (SD)	Total (n=106) Mean (SD)
Age	46.81 ± 16.05	42.06 ± 15.35	44.5 ± 15.380
Weight	65.4 ± 11.37	62.6 ± 8.81	64.1 ± 10.28
Height	162.5 ± 4.662	158.84 ± 3.68	160.79 ± 4.60
BMI	24.71±3.75	24.88±3.69	24.79±3.70

* SD – Standard deviation   *BMI – Body Mass Index

Table 2: Gender wise distribution of anthropometric parameters among the study subjects with normal nutrition

Parameter	Males(n=42) Mean (SD)	Females(n=33) Mean (SD)	Total(n=75) Mean (SD)
Age	42.04 ± 13.67	37.24 ± 12.36	39.9 ± 13.32
Weight	67.04 ± 11.16	62.51 ± 8.37	65.02 ± 10.18
Height	162.7 ± 4.58	158.75 ± 3.94	160.94 ± 4.64
BMI	25.29 ± 3.65	24.8 ± 3.29	25.07 ± 3.48

Table 3: Gender wise distribution of anthropometric parameters among the study subjects with malnutrition

Parameter	Males (n=2) Mean (SD)	Females (n=3) Mean (SD)	Total (n=5) Mean (SD)
Mean Age	81 ± 4.24	64 ± 3.4	70.8 ± 9.85
Mean weight	56 ± 2.8	66.66 ± 6.1	62.4 ± 7.403
Mean height	158 ± 2.8	155 ± 1.00	156.2 ± 2.28
Mean BMI	22.42 ± 0.33	27.73 ± 2.20	25.61 ± 3.30

Table 4: Gender wise distribution of anthropometric parameters among the study subjects at risk of malnutrition

Parameter	Males (n=12) Mean (SD)	Females (n= 14) Mean (SD)	Total (n=26) Mean (SD)
Age	57.41 ± 14.31	48.71 ± 16.29	52.73 ± 15.42
Weight	61.41 ± 12.28	62.14 ± 10.67	61.8 ± 11.1
Height	162.83 ± 5.09	159.85 ± 2.92	161.23 ± 4.44
BMI	23.1 ± 4.18	24.44 ± 4.77	23.82 ± 4.47

Table 5: Anthropometric parameters of COVID patients admitted previously in ward and ICU (n=106)

Patients admitted in	Males Frequency (%)	Females Frequency (%)	Mean Age	Mean Weight	Mean Height	Mean BMI
ICU (n=24)	13 (54.1%)	11 (45.8%)	63.75	62.33	159.4	24.59
Ward (n=82)	44(53.6%)	38(46.3%)	38.86	64.62	161.19	24.85

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Table 6: Comparison of results of studies conducted at different populations

Parameter	Current study	DI FILIPPO et al,[16]	Pironi et al,[17]	Allard et al,[18]
Sample size	106	213	268	108
Origin of data	Kanyakumari, India	Milan, Italy	Bologna, Italy	Bobigny,France
Patient inclusion	Retrospective	Retrospective	Retrospective	Retrospective
Time of assessment	After COVID 19 in remission	After COVID 19 in remission	During treatment of COVID 19	At the time of Hospital Admission
Male	52%	67%	55%	59%
Female	48%	33%	45%	41%
Mean age	44.5	59	74	62
ICU admission	22.60%	3%	17%	13%
Weight loss present	33%	29%	52%	37%
Mean BMI	24.79	27.1	25.1	28.8
UNDERWEIGHT BMI <18.5	4.7 %	2%	9%	5%
18.5-25	53.7%	-	-	-
25-30	44.3%	-	-	-
>30	6.6%	-	-	-

DISCUSSION

In the current study, majority (52%) of the study subjects were males, which is similar to the other studies conducted in Italy, and France (67%,55% and 59%). The mean age among the study participants were above the age of 40 in a similar study conducted at Milan (59 years) and the average age was above 60 years in studies conducted at Italy and France, (62 and 72 years). This may be due to the restrictions advised to protect elderly and children, by the Government of India as part of control of COVID 19. [Table 6]

In the current study 22.6% of the patients were admitted in COVID ICU and the rest were in COVID wards, this is in contrast to 3%, 17% and 13% in studies conducted elsewhere. The mean BMI among the study participants were in the normal range (24.79) while it was in the pre-obese category (27.1, 25.1 and 28.8) in studies conducted in Italy and France. [Table 6]

Among the study participants, 22.6% were at risk of becoming malnourished, which points to the fact that prolonged hospital stays and the disease itself can cause nutritional derangement among the patients. Under nutrition during COVID 19 infection due to reduced food intake to several factors like diarrhoea, vomiting, loss of taste, loss of smell, respiratory discomfort, also due to energy expenditure linked to ventilator work during a severe respiratory infection which induces an inflammatory response.

CONCLUSION

The nutritional status assessment of the post COVID patients revealed that a majority (70.75%) had a normal nutritional status and only 4.7 % were malnourished. When the nutritional status of the patients admitted in ICU and wards were compared, 85.3% of the patients admitted in COVID ward had normal nutritional status when compared to 20.80% admitted in COVID ICU. Among patients admitted in the ward, none of them were having malnutrition when compared to 25% admitted in ICU, and among ICU admitted patients, 54.1% were at risk of malnutrition compared to 14.6% admitted in wards

Recommendations

Diet Assessment in the ward or ICU should be done regularly. Baseline Height and weight should be taken for all patients and monitoring should be done weekly. Assessment of nutritional status frequently by monitoring BMI to find a nutritional deficiency and supplementation of electrolytes by intravenous fluid or by orally can be done. Government food supply in ward and monitoring with quality checking should be regularly.

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