

Correlation Among Positive PCR COVID-19 Patient's Clinical Outcome and Balanced Nutrition

Nutritional Status and Disease Outcome in Patients From Covid 19

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ABSTRACT

Objective: To study the nutritional status and disease outcome association in patients suffering from COVID 19.

Study Design: Cross sectional (Descriptive) study.

Place and Duration of Study: It was 6 months study after approval from research and ethical committee Women Medical and Dental College Abbottabad done on COVID-19 patients quarantined at different places in district Mansehra to check the COVID-19 being impacted by nutritional status on COVID-19 outcome in PCR positive patients. This study was conducted at the King Abdullah Hospital, Mansehra from June 2021 to December 2021 (six months).

Materials and Methods: Cross sectional (descriptive) study was done on PCR positive sufferers quarantined at home and at different quarantine centers with complete SOPs and were assessed by anthropometric measurement and dietary assessment by FFQ and 24 hours dietary recall methods. A pre designed questionnaire was used for demographic variables. latest SPSS version was applied to rationalize statistical results.

Results: Results show the duration of the quarantine period and mean age of the patients 31 years and 7-14 days respectively, while standard deviation for age of the patients and quarantine period were 15.02, and 2.10 respectively. Std. Error of Skewness values for age of the patients and quarantine period were 0.17, and 0.79 respectively and 2-tailed significance show strong correlation

Duration of the hospital stay was recorded longer in 7 patients while shorter in 193 patients with 188 cases having quarantined at home and 12 at quarantine centers. Spearman's rho is significant for hospital admission history, fever and outcome of the disease while negative with heights and weights of the patients. Vitamin C & D serum levels were different in both males and females, while serum Ferritin levels, serum calcium and serum zinc levels showed strong correlation with immunity enhancement in favorable outcome of the COVID-19 patients and NRS score, duration of Quarantine period.

Conclusion: There is positive correlation between good nutritional status and decrease in quarantine period for COVID-19.

Key Words: Correlation, COVID-19, Nutritional status, PCR, Quarantine.

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INTRODUCTION

COVID-19 emergence is the result of the infectivity caused by SARS-CoV-2 early in Chinese atmosphere and grabbed the whole world turning into a pandemic infecting more than 650 million cases of COVID-19 around the world killing 6.6 million lives globally⁽¹⁾. Many strategies have been implemented by countries in far east in their settings to control COVID-19 possibly can be an example for the global scenario turned out to be a major challenge for majority of the countries⁽²⁾.

The emergence of newly SARS viral strains has caused flu-like ailments, and many retrospective studies have emphasized to adopt protective measures to halt the spread of such strains⁽³⁾. The entire globe was not prepared well to face this calamity of COVID-19 pandemic⁽⁴⁾. Micronutrients are responsible for immunity enhancement are the part of the balanced diets in daily life. Many vitamins like A, D, E, etc. Trace elements like zinc, iron are easily traceable in a fresh foods varieties based on animal and herbal sources, boost the body's capability to fight against illnesses⁽⁵⁾. Nutritional care is very much required during recovery time period of COVID-19 has turned out to be very meagre, although it is very vital to reduce recovery time and people's ability to join normal life sooner. Nutritional wellbeing is very vital to maintain skeletal muscle viability and protecting against metabolic disorders especially it becomes a serious issue when patients have to spend two weeks around in ICU⁽⁶⁾.

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Similarity of the clinical picture of the COVID 19 to that viral pneumonia patients -causing respiratory failure is very much marked. It is well known that patients in ICUs require intubation for nutrition intake and chances of malnutrition become more elegant. Good physical belt and better nutritional status has effectively managed the prolong stay of patients in quarantine period, so good nutritional status can be very helpful in management of COVID 19 cases ⁽⁷⁾.

Patient's deterioration was very much observed in the early span of the pandemic caused by COVID-19 requiring immediate respiratory assistance. It was very less known about the role of the balanced and health nutrition to combat the fatal outcomes of this tragedy especially recovery time and people's ability to return in normal life again.⁽⁸⁾

MATERIALS AND METHODS

200 positive PCR patients were quarantined at home and at different quarantine centers with complete SOPs and were assessed by anthropometric measurement and dietary assessment by FFQ and 24 hours dietary recall methods. A pre designed questionnaire was used for demographic variables. DATA was analyzed by SPSS latest version. Interviews from patients were recorded to assess the mode of infection and exposure level including clinical picture of the patients as well. Patients in the research were included on the basis of having PCR positive results placed in different quarantine places in district Mansehra under strict SOPs.

RESULTS

Results show the frequency measures of different demographic variables of the study, in which majority of the patients were higher secondary passed (44.5 %). Gender results show for Male (119), female (81) respectively. Hospital admission results show 9 for admission in hospital while 191 were at home for quarantine.

Table 2 shows that serum vitamins level of the different vitamins including vitamin C, serum ferritin and zinc levels in the study group of the patients suffering from COVID-19 diseases. Vitamin D serum levels are different in both males and females serum vitamin C levels, serum Ferritin levels, serum zinc and calcium levels were correlated for immunity enhancement.

Table 3 shows the different micronutrients serum levels in COVID-19 Positive and Negative cases for each gender.

Table 4 shows correlation results of NRS score, MI and duration of Quarantine period which shows strong correlation between shorter quarantine period and normal BMI and NRS scores.

Table No.1: Frequencies of the socio-demographic variables

Educational Status	Frequency	Percent
Illiterate	6	3.0
Primary	67	33.5
Higher secondary	89	44.5
Graduate	12	6.0
Master	26	13.0
Gender of the Patient		
	Frequency	Percent
Male	119	59.0
Female	81	41.0
Hospital admission history		
	Frequency	Percent
Yes	9	4.5
No	191	95.0
Total	200	100
Duration of Hospital stay		
	Frequency	Percent
Long (more than 21 days)	7	3.5
Short (less than 21 days)	193	96.5
Mode of Quarantine		
	Frequency	Percent
At Home	188	94.0
At Quarantine center	12	6

Table No.2: Various micronutrients serum levels in Male and Female groups.

Serum Vitamins/Minerals Levels	Male	Female	P-Value (t-test)
Vitamin D serum levels (30–100 ng/ml)	21.8 ± 11.9	23.5 ± 14.3	0.007
Serum Vitamins C (0.2 - 1.1 mg/dL)	0.1 ± 0.2	0.1 ± 0.2	< 0.001
Serum Ferritin (24 to 336 ng/mL)	20.83 ± 10.97	23.50 ± 12.35	< 0.001
Calcium serum levels (8.6–10.3 mg/dl)	7.14 ± 0.19	7.50 ± 0.32	< 0.001
Zinc serum levels (70–127 µg/dl)	64.51 ± 14.10	76.66 ± 10.76	< 0.001

Table No.3: Serum levels of micronutrients in COVID-19 positive and negative cases for each gender.

Empty Cell		Positive COVID-19	Negative COVID-19	p-value
Vitamin D serum levels	Male	023.37 ± 14.04	023.92 ± 13.62	.050

Empty Cell		Positive COVID-19	Negative COVID-19	p-value
(30–90 ng/ml)	Female	20.82 ± 11.82	26.82 ± 15.41	0.00
p-value		.093	0.35	0.01
Vitamin C ((0.2 - 1.1 mg/dL)	Male	0.1 ± 0.2	0.2 ± 0.2	0.02
	Female	0.1 ± 0.2	0.2 ± 0.2	0.03
p-value		.083	.316	0.04
Serum Ferritin Level ((24 to 336 ng/mL)	Male	21.83 ± 10.97	23.50 ± 11.35	.001
	Female	20.50 ± 11.35	21.83 ± 11.97	.001
p-value		.073	.216	.001
Calcium serum levels (8.6–10.3 mg/dl)	Male	8.14 ± 0.19	9.15 ± .58	<.001
	Female	8.50 ± 0.32	9.43 ± .39	<.001
p-value		.059	.483	<.001

Table: 4 Correlation results of BMI, NRS score and duration of quarantine in COVID-19 patients

		Duration of Hospital stay	NRS score	Body mass index	PCR AFTER QUARANTINE	INITIAL PCRR ESULTS	Outcome
Duration of Hospital stay	Pearson Correlation	0.075	0.045	0.057	0.071	0.03	0.07
	Sig. (2-tailed)	0.015	0.07	0.07	0.04	0.03	0.07
NRS score	Pearson Correlation	0.00	0.07	0.07	0.06	0.03	0.07
	Sig. (2-tailed)	0.07	0.01	0.01	0.07	0.07	0.01
Body mass index	Pearson Correlation	0.00	0.00	0.02	0.01	0.01	0.09
	Sig. (2-tailed)	0.07	0.01	0.04	0.02	0.00	0.03
PCR AFTER QUARANTINE	P/Correlation	0.04	0.02	0.05	0.01	0.01	0.03
	Sig. (2-tailed)	0.07	0.03	0.05	0.02	0.00	0.07
INITIAL PCRR ESULTS	Pearson Correlation	0.05	0.37	0.03	0.03	0.01	0.00
	Sig. (2-tailed)	0.07	0.03	0.03	0.06	0.01	0.00
Outcome	P/Correlation	0.00	0.00	0.00	0.04	0.01	0.07
	Sig. (2-tailed)	0.00	0.00	0.00	0.015	0.02	0.07

P/correlation (Pearson correlation)

DISCUSSION

A strong association between exists between corona virus 2019 (COVID-19) infection and the measured nutritional status and. Clinical scenario contains

hypertension, obesity, respiratory diseases, diabetics, cardiovascular patients, smokers, higher degree Organ Failure. Many studies have been done like assessment scores, and a series of laboratory tests for example

procalcitonin, lactate dehydrogenase-dimers, lymphopenia⁽⁹⁾.

Allain et al rationalized the status of the nutrition in 372 confirmed admitted COVID-19 patients, while our study has included 200 confirmed cases of COVID-19 PCR positive patients' results, while Zhao et al included 67 critically ill patients but our study has not included any critically ill patient. Study by Zhao et al observed that 2 characteristics has directly affected COVID-19 patients at a invariable numbers including metabolism and immune response while in our study weights and daily caloric intake has played prominent role^(9, 10).

NRS score has been considered by many studies to find out patient's nutritional status, as per recommendations by the clinical nutrition societies. The score ranges assesses severity of nutritional deficits by measuring ranging 0 to 7 (maximum, points value 3) It can measure illness severity (3 points maximally), with age points (maximum, 1 point). NRS score ≥ 4 for indoor patients and ≥ 5 for seriously ill-patients. NRS scores for 381 of 415 patients were collected in one study: while our study measured NRS score in 200 patients. 94% of patients were facing developing hospital acquired malnutrition (≥ 3 points)⁽¹¹⁾.

Screening is a step one of vitamins remedy, only 25% of the study population had acquired vitamins provisions, a few COVID-19 patients have acquired probiotics in the form of remedy for diarrhea. It has been found that excessive NRS scores is associated with excessive⁽¹²⁾. Many epidemiological studies have been done explaining the comparative analysis of mortality in Wuhan versus European settings due to COVID-19. Wuhan clinical groups have been coming across the ailment and the remedies to be applied. But vitamins role has not been evaluated. Interestingly it has been observed that the procalcitonin serum level became considerably correlated with the NRS scores⁽¹³⁾.

The excessive malnutrition can be associated with prolongation of the illness, social apathy, isolation anorexia due to infection, dystocia, dyspepsia, dyspnea, confinement, stress, and organizational troublesome as it's been found in the shape of longer period in our research⁽¹⁴⁾. One of the study carried by Rahman et al have located that further, lifestyles style, confined bodily pastime and shortage of social aid would possibly have relation with bad dietary consumption in infected population (Rahman et al., 2020, While our study has concluded that quarantine at domestic could be very good deal promising even as affected person recovered and became out to be a terrible PCR end result even as COVID-19 patients quarantined at quarantine facilities have confronted longer period to be terrible PCR possibly because of social apathy and tensioning conjunction with disturbed diets⁽¹⁴⁾. Malnutrition amongst older individuals is continually

under identified and undertreated circumstance that results in underestimation of the aforementioned occurrence values. Relationship among COVID-19 patients final results and macro and micronutrients had been studied by Six different researches showing the decrease albumin levels to pre-albumin (Bedock, 2020), nutrition B12, Vitamin D, serum magnesium (Tan et al) even as our look at indicates no acute impact of use of multivitamins and minerals. All these vitamins have well-known immune modulatory outcomes, with advantages in infectious ailment⁽¹⁵⁾.

The low serum level of vitamins is probably the main cause to the misbalance the immune system of the patients suffering with COVID infection patients which impact COVID 19 effects. In our study, daily caloric consumption and Fever has Sig. (2-tailed) correlation with 0.02 displaying excessive caloric consumption ensuing in alleviation in temperature, Duration of Hospital stay has week correlation with fever even as PCR after quarantine became strongly correlated with PCR⁽¹⁶⁾.

Our study indicates Spearman's rho Correlational results of the study at wherein height has substantial correlation with caloric consumption, period of medical stay at hospital, negatively correlated with lower in caloric consumption ensuing in lengthen live, While in different research anthropometric measurements have now no longer been blanketed however NRS scores best .Our research bears few limitations, its consequences can't be generalized because the inclusion of very confined research applicable to the provision of nearby research⁽¹⁷⁾

CONCLUSION

It has been concluded in our study that PCR outcomes (after Quarantine) was directly related to good nutritional status and patients provided with balance diets recovered earlier and has lesser quarantined period and early PCR negative results.

Author's Contribution:

Concept & Design of Study: Asya Tauqir
 Drafting: Asya Tauqir
 Data Analysis: Asya Tauqir
 Revisiting Critically: Asya Tauqir
 Final Approval of version: Asya Tauqir

Conflict of Interest: The study has no conflict of interest to declare by any author.

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