

THE EFFECT OF DIETARY PATTERN ON DURATION OF HOSPITAL STAYS IN PATIENTS WITH RESPIRATORY COVID ILLNESS

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Abstract

Background: The immune system defends the host against many harmful microorganisms. The immune system has developed to contain various specialized cell types, signaling molecules, and functional responses to deal with this wide range of threats. In Covid-19 infections immune system is the key component for prevention of the disease. Hospital admission and duration of stay due to covid 19 infection have a considerable physical, financial, and psychological burden for the individual, family, and country. Diet has been shown to have a vital role in boosting one's immunity. Non vegetarian diet is traditionally considered to be immunity boosting as it is rich in protein, vitamins, and micronutrients.

Aims and objective: To study the effect of dietary pattern on duration of hospital stay in patients with respiratory Covid illness

Material and Methods: This was a double blind retrospective cohort study comprising of 113 patients tested positive in RTPCR for SARS-CoV-2 and admitted at DCH located at super specialty hospital of Jayarogya Group of Hospitals, Gwalior, Madhya Pradesh, was studied retrospectively between July 2020 to October 2020. Patients were divided based on diet pattern into Group A (patients following a vegetarian diet; n=70) and Group B (patients following a non-vegetarian diet; n=43). The outcome was measured as the duration of hospital stay and comparison of diet type, age, and gender of patients. All these patients were discharge stable and case files of deaths were excluded. Non vegetarian diet was defined as inclusion of eggs, meet, fish in the routine diet whereas a vegetarian diet was exclusion of these items.

Result: Out of 113 patients, most (61.94%) had a vegetarian diet, whereas 43 (38.06%) had a non-vegetarian diet. Duration of hospital stay was more in patients in Group A (10.71 ± 5.5 days) than Group B (8.4 ± 4.7 days), $p=0.0302$. Hospital stay was longer (11.05 days) in older patients (>50 years) compared to younger patients (≤ 50 years) (9.2 days) (table 3). In Group A, hospital stay was longer in those with age >50 years (11.4 days) compared to those with age ≤ 50 (9.2 days). On the contrary, older patients had shorter hospital lengths (9.9 days) than younger patients (10.09 days) in Group B (p value =).

Conclusion: A significantly shorter hospital stay was observed in patients of respiratory covid infection following a non-vegetarian diet with Covid-19 infection.

Keywords: hospital stay, non-vegetarian diet, Covid-19 infection, immune system

Introduction

The current pandemic of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections is characterized by progressively severe pneumonia and ARDS leading to increased duration of hospital stay, which leads to huge physical, psychological, and financial burden on individuals, the family as well as the whole country.

Non-vegetarian food, which has a high protein, vitamins, and minerals content, provides an immune boost in the individual, increasing the number of leukocytes, platelets, and complement factors that help the body fight this deadly virus.

Though many clinical trials have shown that a non-vegetarian diet boosts immunity, the role of a non-vegetarian diet in covid 19 infections is lacking. Hence, through the present observational analysis, we tried to study the effect of a non-vegetarian diet on the duration of hospital stay in Covid-19 infected patients.

Material and method

This was a retrospective cohort study. The case records of 113 patients admitted in DCH located at the super specialty hospital of Jayarogya group of hospitals, Gwalior, Madhya Pradesh, were analysed retrospectively. A total of 113 were found eligible for the present study.

Inclusion criteria: Patients admitted from July 2020 to October 2020. Eligible patients were men and non-pregnant women aged 18 to 75 years who tested positive in RTPCR for SARS-CoV-2.

Exclusion criteria: Those with comorbidities such as diabetes mellitus, hypertension, chronic kidney disease, etc., pregnant women, and those younger than 18 years and older than 75 years.

The patients were divided into groups;

Group A (with a vegetarian diet; n=70) and

Group B (patients with a non-vegetarian diet; n=43).

The outcome was measured as the duration of hospital stay and compared with diet type, age, and gender of patients.

A vegetarian diet is characterized by grain pulses, plant protein, milk, fruits and vegetables.

Non-vegetarian diet refers to the intake of eggs, meat and fish as primary source of protein along with greens and pulses.

All the data analysis was performed using IBM SPSS ver. 20 software. Frequency distribution and cross-tabulation were performed to prepare the tables. Duration of hospital stay was presented as mean and standard deviation, and categorical data like gender was expressed as number and percentage. An independent sample t-test was used to compare the duration of hospital stay with all the binary variables. A p-value of <0.05 was considered significant.

Results

Out of 113 patients recruited, 70 (61.94%) had a vegetarian diet, whereas 43 (38.06%) had a non-vegetarian diet.

The mean duration of hospital stay in patients with a non-vegetarian diet was lower (8.4 days) as compared to the vegetarian diet (10.71 days) with p value= 0.0302 (table 1).

Table 1: Comparing mean duration of hospital stay between groups

Parameters	Groups		P-value
	Group A	Group B	
Total no of patients	70	43	0.0302
Mean duration of hospital stay (in days)	10.71	8.4	
SD	5.56	4.7	
SEM	0.67	0.73	

SD: standard deviation; SEM: standard error mean

Figure 1: Comparison of duration of stay (days) between gender

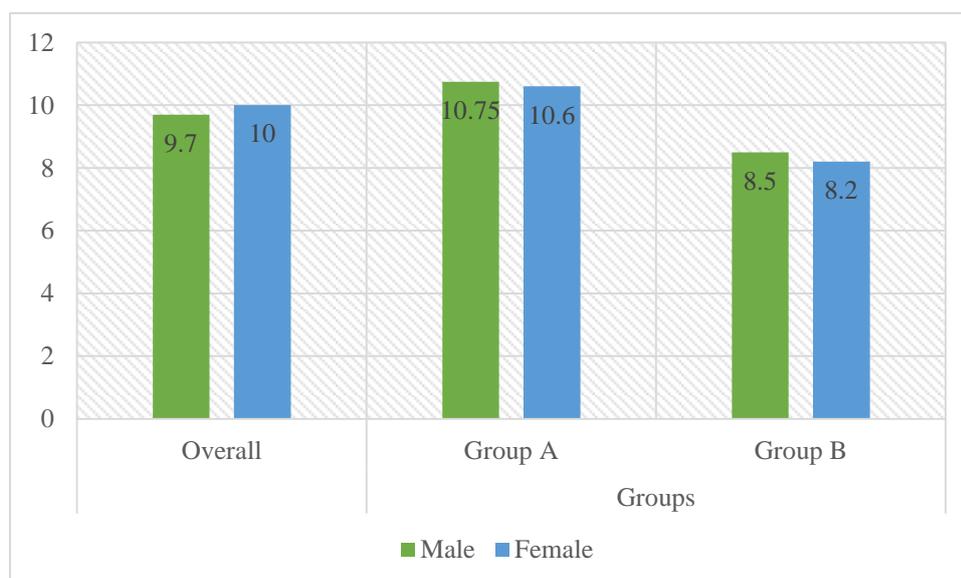


Table 2: Comparison of mean duration of stay taking age cut off 50 years

Age group (years)	Overall	Groups	
		Group A	Group B
>50 (Older)	11.05	11.4	9.9
≤50 (Younger)	9.2	8.8	10.09

Hospital stay was longer (11.05 days) in older patients (>50 years) compared to younger patients (≤50) (9.2 days) (table 2).

In Group A, hospital stay was longer in those with age >50 years (11.4 days) compared to those with age ≤50 (9.2 days).

On the contrary, older patients had shorter hospital lengths (9.9 days) than younger patients (10.09 days) in Group B.

Discussion

SARS-CoV-2 is new to the human immune system, so there is no underlying natural immunity against it. This is probably why SARS-CoV-2 has spread so rapidly. Our diet has an impact on our well-being and our health. In the present study, we evaluated the role of the diet of Covid-19 patients on the length of hospital stay.

It was an interesting observation that among those patients who followed a non vegetarian diet, the older patient had a short duration of hospital stay.

It was found that the mean duration of hospital stay in patients with a non-vegetarian diet was lower (8.4 days) than the vegetarian diet (10.71 days). A Population-based study from Austria by Bankert et al. studied 1320 subjects after dividing them into a vegetarian, a carnivorous diet rich in fruits and vegetables, a carnivorous diet less rich in meat, and a carnivorous diet rich in meat. They reported that a vegetarian diet is linked to poor health (greater rates of cancer, allergies, and mental health disorders), increased healthcare costs, and a lower quality of life. Though this study was not performed on Covid-19 patients but provided an indirect clue that a non-vegetarian diet can offer multiple benefits to Covid-19 patients too.

Individuals with weakened immune systems and older adults with existing morbidities such as diabetes, cardiovascular disease, pulmonary disease, and hypertension are particularly vulnerable to severe symptoms and mortality. (Calder PC 2020) In the present study, hospital stay was longer in those older than 50 years compared to younger patients with a vegetarian diet.

Nutritional support for COVID-19 patients throughout their hospital stay is little understood. Nutritional therapy is first-line management that should be included in routine practice. A broad and well-balanced diet should provide optimal consumption of all nutrients, because it affects critical functions in the immune system infections and other stressors can impair micronutrient status, some micronutrient intakes may play a role in reducing the risk and consequences of diseases.

Protein deficiency has been related to weakened immune system function, owing to its detrimental effects on the number of functional immunoglobulins and the lymphoid tissue in the gut (GALT). Protein quality, in addition to quantity, is a crucial element in the interaction between this macronutrient and the immune system. In this vein, it has been suggested that adding high biological value proteins (such as those found in eggs, lean meat, fish, and dairy) that contain all the essential amino acids may have anti-inflammatory properties.

Furthermore, several amino acids, such as arginine and glutamine, are well known for their immune system modulating properties. The present study further proved this, where non-vegetarians had shorter hospital stays due to improved infections than vegetarians.

Strength of present study: Ours is the first of its kind where we highlighted the effect of diet on the duration of hospital stay of patients with Covid-19.

The present study had few limitations; small sample size and retrospective cohort nature are a few of them. There is a need for a large prospective study, which can provide strength to present study findings.

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