Original Research Article

Serum albumin level as a marker to predict morbidity in post COVID-19 patients admitted in a rural critical care unit

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ABSTRACT

Background: Covid-19 raged for more than two years in almost all parts of the world including India and the long term effects are yet to be studied. Presently with the availability of vaccine has reduced the suffering even after covid-19 infection. This study is aimed to understand the patient with past history of covid-19 infection and serum albumin levels and the outcome.

Materials and Methods: A total of 52 patients admitted to intensive care unit with past history of COVID-19 infection, between 01.11.2021 and 31.01.2022, were enrolled in this study. The required data were collected from the records.

Results: Of the total 52 patients included in the study, 41 (78.85%) were males and 11 (21.15%) were females. Amongst these 52 patients, 18 (34.6%) were detected with hypoalbuminemia. Higher association of co-morbidities (22.22% patients) was seen in patients with hypoalbuminemia. Death rate in hypoalbuminemia group was 11.11% while that in those with normal albumin levels was only 2.94%.

Conclusion: Patients with hypoalbuminemia and previous covid 19 infection were having higher mortality rate as compared to normoalbuminemia.

1. Introduction

Covid-19 raged for more than two years in almost all parts of the world including India. The statistics by World Health Organization (WHO) indicate that almost 14.9 million lives have been claimed until December 2021 by Covid-19. The novel virus outbreak has challenged India's economic, medical and public health infrastructure.[1] A quick glance at the previous studies reveals that many factors influence the course and outcome of the disease. These include age and diagnosis of the patient, associated illness and severity of the disease. Amongst the varied predictors mentioned in previous studies, serum albumin seems to have been given less importance in Covid-19 patients. Various risk factors like advanced age, male gender and comorbidities like diabetes mellitus, obesity, systemic hypertension, renal diseases, coronary artery disease and malignancy were considered.[2,3]

Nutritional support plays a crucial role in critically ill patients, especially in those where oral intake is not possible. With healthcare systems and available resources struggling to cope up with the increasing number of cases and deaths during a pandemic, estimation of serum albumin can prove to be a quick guide to patient care and clinical

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outcome including intensive care unit (ICU) mortality.[4,5] We, thus, conducted this study with an aim to identify serum albumin as a marker to predict prognosis of covid-19 patients admitted in intensive care unit in a resource limited setting.

2. Materials and Methods

After obtaining approval from the Institutional Ethical Committee, this retrospective study was carried out in an intensive care unit of a rural tertiary care hospital. A total of 52 patients admitted to intensive care unit with past history of COVID-19 infection, between 01.11.2021 and 31.01.2022, were enrolled in this study. Demographic characteristics and other data including diagnosis of patients, associated co-morbidities, laboratory investigations and outcome of the patient (in terms of discharge or death) were noted. Hypoalbuminemia was considered as serum albumin concentration <3.5g/dl in our study. Serum albumin levels investigated in the first 24hours of admission to critical care unit were considered.

3. Results

Of the total 52 patients included in the study, 41 (78.85%) were males and 11 (21.15%) were females. The average age of patients in our study was around 45 years. Amongst these 52 patients, 18 (34.6%) were detected with hypoalbuminemia. As compared to the patients with normal serum albumin levels, higher association of co-morbidities (22.22% patients) was seen in patients with hypoalbuminemia (Figure 1). Diabetes and hypertension were observed to be the most common co-morbidities amongst these patients. Death rate in hypoalbuminemia group was 11.11% while that in those with normal albumin levels was only 2.94%.
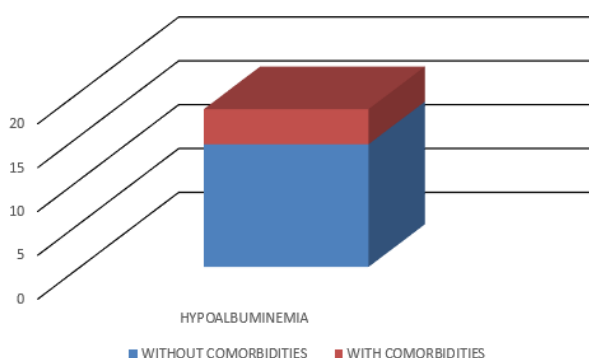

Fig. 1: Patient with hypoalbuminemia and comorbidities

4. Discussion

This study was done in adult critical care unit. The patients with history of covid 19 infection admitted were aged around 45 years suggesting that, readmission of patients with younger than that age or in elderly patients were less. This may be due to the patients with this age group were extensively exposed to the population and there was a possibility of cross infection. This is the age group where new onsets of comorbid illness are common.[6] Most of the patients were on treatment. As expected the patients had either diabetes or hypertension among these patients. Majority of the patients were male patients as in India the working population is male as compared to females. This could be the reason due to which male patient number is more. This is also found that woman are more resistant than men for covid 19 infection[7] A total of 18 (34.6%) patients were suffering with hypoalbuminemia suggesting that there is a possibility of nutritional deficiency leading to the hypoproteinemia among these patients. In a similar retrospective study conducted by Haung et al showed the incidence of hypoalbuminemia was around 35.5%, which is in line with our study results.[8] The death rate among the patients with hypoalbuminemia with history of previous covid infection was more when compared with normoalbuminemia. In previous research it has been shown hypoalbuminemia contributes for the mortality.[9] This shows the importance of the serum albumin levels as a survival marker. The serum albumen plays an important and vital homeostatic function in human body.[10]

5. Limitations of the study

Despite of the best of efforts, our study had few limitations. Only one specific value of serum albumin at the time of admission was considered and not the series of data. Integration of other parameters like nutrition mode and disease severity scores would have provided better insights into clinical outcome of patients.

6. Conclusion

Based on our study results, the most patients readmitted with history of covid 19 infection were at the age group of 40s. Most of these patients were having comorbid illness. Patients with hypoalbuminemia and previous covid 19 infection were having higher mortality rate as compared to normoalbuminemia.

7. Source of Funding

None.

8. Conflict of Interest

None.

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