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CORRELATION BETWEEN DIABETES AND MORTALITY IN CRITICALLY ILL PATIENTS ADMITTED TO CRITICAL CARE DEPARTMENT

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ABSTRACT

Background: Complications are more common in critically ill individuals with diabetes, and there is a lack of information in the literature about how diabetes impacts ICU outcomes, which necessitates further research.

Aim: The purpose of this study was to assess the association between outcomes and diabetes mellitus in critically ill Indian patients admitted to intensive care units.

Methods: The hospital records of patients with diabetes mellitus who were admitted to the Institute's intensive care unit during the designated study period were assessed. All included subjects' records were used to assess ICU mortality, length of stay, and blood glucose level at ICU admission.

Results: 34.14% (n=160) of the 480 study participants had diabetes. There was a positive correlation between the length of stay in the intensive care unit and the capillary blood glucose level at admission. Compared to non-diabetic subjects, diabetic subjects spent significantly more time in the intensive care unit (ICU) (p-value = 0.02). Furthermore, neither the mortality nor the ICU cure rates differed statistically significantly between the two groups.

Conclusion: The current study concludes that the presence of diabetes affects the length of stay in the intensive care unit and that the capillary blood glucose level at the time of ICU admission positively correlates with the length of stay. However, neither ICU mortality nor cure rates are impacted by diabetes.

Keywords: Diabetes Mellitus, ICU, ICU mortality, outcomes, ICU stay length

INTRODUCTION

Hyperglycemia is an adaptive metabolic response to severe stress in critically ill patients. Existing literature has demonstrated that intensive use of insulin therapy lowers the mortality rate in critically ill subjects. According to international consensus guidelines, it has been suggested that targeted blood glucose management is necessary regardless of a history of diabetes mellitus. Furthermore, it has been noted that individuals who are critically ill and have higher HbA1c have higher mortality rates because HbA1c is a measure of previous glycemic control.[1]

Furthermore, the relationship between the patient's previous metabolic state and the optimal glycemic control target in an intensive care unit (ICU) is controversial. Understanding how diabetes impacts clinical outcomes and mortality in critically ill subjects is therefore crucial. However, conflicting results have been reported regarding the effect of diabetes mellitus on clinical outcomes and mortality rates in critically ill subjects.[2]

Regardless of diabetes mellitus, a retrospective analysis of the data showed a positive correlation between hyperglycemia and mortality and cardiovascular disorders for patients admitted to the intensive care unit. However, it has also been claimed that it has no bearing on any unfavorable outcome of a patient's stay in the intensive care unit. Additionally, it has been discovered that the odds ratio for death at all stages of hyperglycemia in diabetic subjects is low when compared to people without diabetes.[3]

Prior studies have also demonstrated that glycemic variability negatively affects the outcomes and mortality rate in critically ill patients, independent of preexisting diabetes mellitus.[4,5] In order to compare the frequency of acute kidney injury (AKI), the need for mechanical ventilation (MV), the need for inotropic or vasopressor support, outcomes, and clinical profile between critically ill diabetics and non-diabetics, the current study was conducted.

MATERIALS AND METHODS

The present retrospective observational study aimed to assess the association between diabetes mellitus and outcomes in critically ill Indian patients admitted to the intensive care unit. Participants in the study were drawn from the Institute's medical department.

Prior to the study, all participants and school administrators gave their verbal and written informed consent. Data from patients admitted to the Institute's critical care unit during the specified study period were retrospectively analyzed. Every piece of information was collected anonymously. Participants whose blood glucose levels were not monitored while they were in the hospital were excluded from the study.

The date of death was one piece of data obtained from the subjects' records. Date of discharge, age, gender, all blood glucose tests performed in the ICU, lipid profiles, capillary blood glucose level at admission, history of diabetes mellitus at admission, duration of ICU stay, and occupation of the subjects.

Following data collection, participants were split into two groups based on whether or not they had diabetes mellitus based on glycemic measurements obtained during their ICU stay.

The American Diabetic Association's case definition of diabetes mellitus was considered in the study. ANOVA, the chi-square test, and the student's t-test were used to statistically analyze the collected data using SPSS software. A p-value of less than 0.05 was chosen as the significance level.

REULTS

The present retrospective observational study aimed to assess the association between diabetes mellitus and outcomes in critically ill Indian patients admitted to the intensive care unit. The hospital records of diabetes mellitus patients admitted to the Institute's intensive care unit during the designated study period were examined in the current study.

The results of the study showed that 34.14% (n=160) of the 480 participants had diabetes. Research participants with and without diabetes had comparable average ages (p=0.314). Gender differences among the study participants were also comparable, with p=0.05 and 0.08 for males and females, respectively. The lipid profiles of diabetics and non-diabetics showed similar levels of LDL-C, HDL-C, triglycerides, and total cholesterol (p=0.345, 0.244, 0.125, and 0.083, respectively) (Table 1).

In terms of occupation, lipid profile, gender, and age, it was found that there was no appreciable difference between the study participants with and without diabetes. However, the distribution of baseline morbidities between individuals with and without diabetes was found to differ statistically significantly (p-value <0.05).

The results of the study showed that the mortality rate for people with diabetes was 28.52%, whereas it was much lower for people without the condition, at 22.21%. Although the mortality rate was higher in subjects with diabetes, there was no statistically significant difference between the two groups. The mean length of stay in the intensive care unit, however, was significantly longer for diabetics than for non-diabetics when comparing the two groups. Furthermore, it was found that the presence or absence of sequelae at the time of discharge influenced the ICU cure rate. When there were no side effects, it demonstrated healing. Based on the ICU cure rate, there was no statistically significant difference between diabetics and non-diabetics.

Furthermore, a positive correlation was found between the length of ICU hospitalization and the capillary blood glucose level at the time of ICU admission.

DISCUSSION

Hospital records of people with diabetes mellitus who were admitted to the Institute's intensive care unit during the designated study period were examined in the current study. The results of the study showed that 34.14% (n=160) of the 480 participants had diabetes. Research participants with and without diabetes had comparable average ages (p=0.314).

Gender differences among the study participants were also comparable, with p=0.05 and 0.08 for males and females, respectively. The lipid profiles of diabetics and non-diabetics were similar in terms of LDL-C, HDL-C, total cholesterol, and triglycerides (p=0.345, 0.244, 0.125, and 0.083, respectively).

These findings were comparable to those of previous studies conducted by Chakroborty B et al.5 and Chakroborty B et al.6, in which the authors assessed subjects whose demographic data was comparable to the present investigation. The results of the study showed that there was no significant difference in age, gender, occupation, or lipid profile between the study participants with and without diabetes. However, the distribution of baseline morbidities between individuals with and without diabetes was found to differ statistically significantly (p-value <0.05).

These results were consistent with those of Leonidou L et al. (2007) and Zelihic E et al., who discovered a statistically significant difference in the distribution of baseline morbidities between individuals with and without diabetes.

Compared to the non-diabetic participants, who had a mortality rate of 22.21%, the study participants with diabetes had a mortality rate of 28.52%. Although the mortality rate was higher in subjects with diabetes, there was no statistically significant difference between the two groups. The mean length of stay in the intensive care unit, however, was significantly longer for diabetics than for non-diabetics when comparing the two groups.

These findings were in line with those of Mahmoodpoor A et al. (9) and Siegelaar SE et al. (10), who discovered that critically ill patients with diabetes had significantly longer stays than those without the condition and that there was no statistically significant difference in mortality between those with and without the disease.

The results of the study also showed that the presence or absence of sequelae at the time of discharge affected the ICU cure rate. When there were no side effects, it demonstrated healing. Based on the ICU cure rate, there was no statistically significant difference between diabetics and non-diabetics. Furthermore, a positive correlation was found between the length of ICU hospitalization and the capillary blood glucose level at the time of ICU admission.

These results were in line with those of Michalia M et al. (2011) and Slynkova K et al. (2006), who also discovered a positive relationship between the capillary blood glucose level at the time of ICU admission and the length of ICU hospitalization.

CONCLUSION

that having diabetes affects how long a patient stays in the intensive care unit, and that there is a positive correlation between the length of stay and the capillary blood glucose level at the time of ICU admission. However, neither ICU mortality nor cure rates are impacted by diabetes. However, more longitudinal research with a larger sample size and longer monitoring is needed to reach a more conclusive conclusion.

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S. No	Characteristics	Diabetics	Non-diabetics	Total	p-value
1.	**Mean age (years)**	51.26±1.56	55.06±2.39	53.95±1.33	0.314
2.	**Gender (%)**				
a)	Males	54.6	46.8	49.5	0.05
b)	Females	45.2	53	51.3	0.08
3.	**Lipid profile**				
a)	LDL-C	89.06±2.00	87.06±2.20	87.95±2.75	0.345
b)	HDL-C	43.01±3.08	45.02±2.31	44.78±2.06	0.244
c)	Triglyceride	133.05±3.18	128.222±2.19	130.95±2.86	0.125
d)	Total cholesterol	194.20±2.24	188.32±4.24	190.09±3.09	0.083

Table 1: Demographic data of diabetic and non-diabetic study subjects