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ORIGINAL ARTICLE

Association of Mortality between Diabetic and Non Diabetic Patients with Covid 19

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ABSTRACT

Objective: Aim of current study is to determine the comparison of death rates among diabetic and non diabetic patients with coronavirus disease.

Study Design: Retrospective/Observational study

Place and Duration: The study was conducted at Diabetes Hospital, Peshawar and Medicine department of Avicenna Medical & Dental College and Hospital, Lahore for the duration of six months from December 2020 to May 2021.

Methods: There were one hundred and fifty patients of both genders either diabetic or non diabetic with ages 20-75 years were included in this study. After receiving informed written agreement, the demographics of enrolled patients were recorded, including age, gender, BMI, and socio-economic status. All patients who had a confirmed diagnosis of COVID-19, with polymerase chain reaction testing, were included in the study. Outcomes among all patients in terms of mortality rate were recorded among all cases. We used SPSS 21.version to analyze complete data.

Results: Among 150 patients, 60 (40%) cases were diabetic and 90 (60%) were non-diabetic. Mean age of the patients was 35.14±11.44 years and mean BMI 29.31±8.55 kg/m^2. We found most of the cases 85 (56.7%) were males and 65 (43.3%) were females. 95 (63.3%) patients had poor socioeconomic status. Most common comorbidity was hypertension found in 68 (45.3%) cases followed by cardiovascular disease in 45 (30%) cases. Frequency of mortality in diabetic patients was significantly higher found in 35 (58.3%) cases as compared to non diabetic patients in 27 (30%) cases with p value <0.005.

Conclusion: Diabetic individuals with COVID-19 showed a considerably greater death rate compared to non-diabetics. As a result, diabetes patients must be educated about the risks of infection-related hyperglycemia, the necessity of following sick-day policies, and the consequences of social isolation.

Keywords: Covid 19, Diabetic, Non Diabetic, Mortality, Hypertension

INTRODUCTION

Diabetes kills around 3 million individuals each year due to insulin deficiency or dysfunction. According to the World Health Organization, the number of persons diagnosed with diabetes is anticipated to reach 438 million by 2030 [1]. In 2010, there were 3 million people with diabetes in Iran, and the World Health Organization expects that number to climb to 6 million by 2030. The immune system of individuals with diabetes (PWD) is compromised, putting them at risk for Coronavirus Disease 2019. (COVID-19). [2,3]

COVID-19 has been linked to diabetes, which may lead to a pro-inflammatory condition. An increase in inflammatory mediators and an abnormal glycosylation of the ACE2 receptor have been linked to 51 percent of the COVID-19 patients' hyperglycemia [5], which may encourage SARS-Cov-2 infection. [6]. The overall case fatality rate (CFR) was reported by the Chinese Center for Disease Control and Prevention to be 2.3%, whereas the CFR for diabetics was found to be 7.3% [7]. According to several research studies, the percentage of COVID-19 patients who have diabetes varies from 5 to 20 percent. 14 to 32% of COVID-19 patients [8] have diabetes, which increases their risk of serious or life-threatening disease.

Many drugs have been repurposed for COVID-19 treatment. Diabetes patients often get metformin as part of their care. Patients with COVID-19 were advised to stop using metformin as early as possible in the outbreak of the pandemic [9]. Metformin should be discontinued since it has been associated with the development of lactic acidosis. In spite of the increased risk of acidosis and lactic acidosis that metformin was linked to, it had no influence on mortality [11]. However, one early study [12] found a relationship between metformin use and an increased risk of life-threatening effects.

Several investigations and studies have shown that those with diabetes have a worse prognosis than those who do not have the disease (Xu et al., 2019). [13] This susceptibility to other illnesses has previously been discovered by SARS (Yang et al., 2006). [14] COVID-19 patients with diabetes are not more likely to develop COVID 19 than the general population, but they are a high-risk group for complications, intensive care unit hospitalizations, and invasive ventilation or death in COVID-19 patients with diabetes (Blanke, 2020; Klein, 2020). [15]

Because diabetics come in all shapes and sizes, epidemiological research suggests that diabetes is a factor in viral infections like COVID-19. Diabetes patients admitted to the hospital with COVID-19 were studied for their clinical characteristics and mortality rates as part of this study.

MATERIAL AND METHODS

This retrospective/observational study was conducted at Diabetes Hospital, Peshawar and Medicine department of Avicenna Medical & Dental College and Hospital, Lahore for the duration of six months from December 2020 to May 2021 and consisted of 150 patients who had Covid 19 illness. After receiving informed written agreement, the demographics of enrolled patients were recorded, including age, gender, BMI, and socio-economic status. Patients <20 years of age, pregnant women and those did not give any written consent were excluded from this study.

Between the ages of 20 and 75, those who participated in the research were included. RT-PCR was utilized to validate the presence of COVID-19 in the nose and throat swab samples analysed. They were returned back to their own homes with just mild symptoms and normal vital signs." Every day, health professionals checked on the isolated patients to make sure they had normal vital signs (pulse, respiration rate, and blood pressure). The patient was admitted to the hospital because of breathing difficulties and an oxygen saturation level that was less than 90%. 90% to 93% of patients required to be hospitalized or isolated at home, depending on the physicians' judgment and other clinical considerations. Diabetics were then compared to non-diabetics in terms of demographics and symptoms and the influence of comorbid diseases on mortality and survival was studied. Patients with and without diabetes who had their clinical symptoms and co-

occurring conditions were compared. The whole data set was analyzed using SPSS 21.

RESULTS

Among 150 patients, 60 (40%) cases were diabetic and 90 (60%) were non-diabetic.(fig 1)

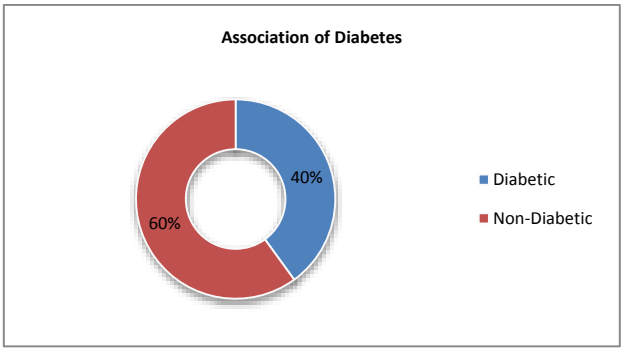

Figure 1: Association of diabetes among enrolled cases

Mean age of the patients was 35.14±11.44 years and had mean BMI 29.31±8.55 kg/m^2. We found most of the cases 85 (56.7%) were males and 65 (43.3%) were females. 95 (63.3%) patients had poor socioeconomic status.(table 1)

Table 1: Enrolled cases with detailed demographics

Variables	Frequency	Percentage
Mean Age (years)	35.14±11.44	
Mean Age (kg/m^2)	29.31±8.55	
Gender		
Male	85	56.7
Female	65	43.3
Socio-Economic Status		
Poor	95	63.3
High	55	36.7

Most common comorbidity was hypertension found in 68 (45.3%) cases followed by cardiovascular disease in 45 (30%) cases and chronic kidney disease found in 22 (14.7%) cases.(fig2)

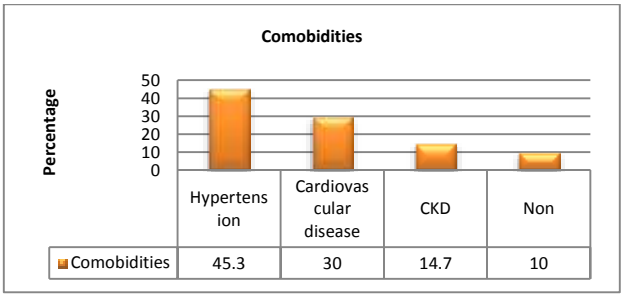

Figure 2: Other comorbidities among enrolled cases

Frequency of mortality in diabetic patients were significantly higher found in 35 (58.3%) cases as compared to non diabetic patients in 27 (30%) cases with p value <0.005.(table 2)

Table-2: Comparison of mortality among diabetic and non diabetic patients

Variables	Diabetic (60)	Non-Diabetic (90)
Mortality		
Yes	35 (58.3%)	27 (30%)
No	25 (41.7%)	63 (70%)
Total	60 (100%)	90 (100%)

We found that among mortality rate among male patients were significantly high as compared to females in both diabetic and non diabetic patients.(table 3)

Table 3: Comparison of mortality with gender

Variables	Diabetic	Non-Diabetic
Gender		
Male	20 (57.1%)	17 (62.9%)
Female	15 (42.9)	10 (37.1%)
Total	35 (100%)	27 (100%)

DISCUSSION

Those who have COVID-19 infection and co-existing chronic illnesses such hypertension, cancer, cardiovascular disease, or diabetes may be more susceptible to death due to their infections [16,17]. Diabetes was not only a common co-morbidity associated with COVID-19, but it has also been linked to an increased mortality risk after infection with COVID-19 in earlier investigations. Many researchers have also postulated about the method through which COVID-19 infection influences the vulnerability and mortality of diabetic persons. When compared to healthy individuals without COVID-19, diabetics were more likely to develop hyper-inflammation and cytokine storm syndrome, as well as lower viral clearance rates and an increased risk of cardiovascular disease. These findings suggest that diabetes may be contributing to the increased severity of COVID-19.

In our study 150 patients who had coronavirus disease were included. Among 150 patients, 60 (40%) cases were diabetic and 90 (60%) were non-diabetic. Mean age of the patients was 35.14±11.44 years and mean BMI 29.31±8.55 kg/m^2. We found most of the cases 85 (56.7%) were males and 65 (43.3%) were females. 95 (63.3%) patients had poor socioeconomic status. Results of our study were compared to the recent researches.[19,20] Most common comorbidity was hypertension found in 68 (45.3%) cases followed by cardiovascular disease in 45 (30%) cases and chronic kidney disease found in 22 (14.7%) cases.[21] In line with prior research [22], we found that diabetics had poorer clinical conditions and more comorbidities than non-diabetics. Additionally, intubation and death rates were linked to cardiovascular and renal comorbidities, as well as smoking/former smoking, neurological disorders, and other risk factors. In diabetic patients, CKD and the requirement for prisma were also risk factors for both mortality and intubation outcomes in a univariate study. In multivariate analyses, chronic kidney disease (CKD) is still a significant predictor of the need for intubation. According to the Coronado study,[23] diabetic individuals with COVID-19 had a decreased kidney function that was an independent risk factor for early mortality.

Frequency of mortality in diabetic patients was significantly higher found in 35 (58.3%) cases as compared to non diabetic patients in 27 (30%) cases with p value <0.005. These results were in line with previous many researches.[24,25] Diabetics exhibited worse clinical conditions and more comorbidities than non-diabetics, in accordance with previous studies [22]. A number of additional risk factors, including cardiovascular and renal comorbidities, smoking cessation, and neurological illnesses were linked to intubation and death rates. A univariate study of diabetics found that diabetes, kidney disease, and the use of prisma were all risk factors for mortality and intubation outcomes. A multivariate study still shows that chronic kidney disease (CKD) has a significant impact. This research found that diabetics with COVID-19 had worse renal function, which was associated with an increased risk of dying younger than expected. [23]

CONCLUSION

Diabetic individuals with COVID-19 showed a considerably greater death rate compared to non-diabetics. As a result, diabetes patients must be educated about the risks of infection-related hyperglycemia, the necessity of following sick-day policies, and the consequences of social isolation.

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