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Original Research Article

COVID-19 Disease and Comorbidity Effects on Dedicated Hospital in Bangladesh: A Prospective Study

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Abstract: ***Background:*** Coronaviral disorder (COVID-19) is a worldwide pandemic originating in Wuhan, China and spreading rapidly across the world and infecting human beings independently of age, sex, and race. There is still a lot to learn, given the nature of this infection. People with COVID-19 have reported a variety of symptoms, ranging from minor symptoms (e.g., common cold) to serious conditions such as bronchitis, pneumonia, severe acute air distress (ARDS) syndrome, multi-organ failure and even death. Comorbidity is a key component in the pandemic result COVID-19 which frequently results in fast and serious development, including death. ***Objective:*** The research examined the socio-demographic characteristics and characteristics of COVID-19 and assessed the effect of comorbidity on their hospital result. ***Methods:*** This observatory research was placed from April 2020 to September 2020 at Rajshahi Medical College, Rajshahi and CDM Hospital, Rajshahi (COVID-19) specialized hospital for a period of 06 months. All clinically suspected RT-PCR confirmation patients were included. Data were gathered via thorough patient history and then reviewed, consistency checked, and resulted modified. The coded data were examined using the SPSS software program after editing and coding. ***Results:*** The research included 627 patients, 552 of whom were in the covid ward and 75 in the ICU. 354 of Covid's (552) hospitalized patients were male (64.13%) and 198 (35.86%) were female (1:0.56%) patients. Young patients (age 19-50) were more impacted and hospitalized (62.86%), urban patients (52.61%) more susceptible than rural patients (47.28 percent). The primary symptoms were fever, cough and shortness of breath (63.04 percent, 45.47, and 42.39 percent, respectively). 44.20 per cent of patients with 55.79 per cent co-morbidities are not comorbid. Concerning co-morbidities. The major concurrent illnesses were hypertension (17.57%), followed by diabetes (15.94%), ischemic cardiac disease (05.60%), chronic blockage (05.60%), chronic renal disease (2.2%), heart attack (1.44%) and cancer (1.54 percent). (0.36%) of the population. A total of 75 patients, most of them seniors, required ICU treatment (64 out of 75). With regards to hospital outcomes, 96.74% (534 of the 552) and 45.34% (34 of the 75) of ICU admitted patients were released safely, whereas 03.2% and 54.66% of ICU patients hospitalized had expired. The number of fatalities among seniors was greater (n=43; 72.88 percent). Hypertension, diabetes and ischemic heart disease were often associated with dementia (42.37 percent, 37.28 percent, and 16.94 percent, respectively). ***Conclusion:*** The huge number of people with fever, poisoning and shortness of breath. The percentage of COVID-19 hospitalizations linked to mortality has remained high the elderly and those suffering from one or more comorbid illnesses. Elderly and comorbid patients should thus take all the required measures to prevent SARS CoV-2 infections.

Keywords: Coronavirus, COVID-19, SARS-CoV-2, Clinical features, Comorbidity.

INTRODUCTION

An epidemic of new coronavirus (SARS-CoV-2) that occurred in Wuhan, China, in December 2019 resulted in a worldwide pandemic impacting about 250 nations across the world. The virus, known as Severe Acute Coronavirus 2

Respiratory Syndrome (SARS-CoV-2), produces the 2019 coronavirus syndrome (COVID-19). In certain situations, SARS-CoV-2 is primarily transmitted via respiratory droplets and infected fomites as well as aerosols [1].

Several studies assessed the COVID-19 incubation period. Based on China's experience, the usual duration of incubation of COVID-19 was determined to be 5.1 days on average. The average incubation time for COVID-19 was found between 4 days and 10.9 days. Incubation period distributions are substantially varied for various age groups. About 95 percent of symptomatic patients in any age group will exhibit symptoms within 14 days. This justifies the quarantine in many nations presently practiced [2, 3] The virus affects men and women of all age groups, including women and men. Older age, male sex, obesity, high blood pressure, diabetes, cardiovascular disease and chronic lung disease, chronic kidney disease(CKD) are worse and are the risk factors for death by COVID-19 [4, 5]. Blood pressure and diabetes individuals have higher rates of morbidity and death and are associated with greater hospitalization and ICU admissions. The pre-existing COPD is likely to exacerbate the COVID-19 progression and forecast [6]. Seniors are more vulnerable to this disease and are more likely to get greater death rates in the ICU. The alterations in the elderly population owing to age may be attributed to lung architecture and muscle atrophy changes, which leads to change in physiological function, a decrease in the pulmonary reserve, reduction in airway clearance, and a decrease in defensive barrier function [7].

COVID-19 infection ranges from asymptomatic to severe acute respiratory syndrome requiring mechanical ventilation and its wide spectrum of severity. Among symptomatic patients, about 80% have shown moderate clinical progression characterized by dry cough, sore throat, low temperature, or malaise; the overall status has deteriorated in 20% of instances in approximately seven days from the onset of symptoms, ending in respiratory failure [9]. As the new coronavirus continues to develop, our understanding of who precisely this virus might have a significant effect is still quite limited.

METHODS AND MATERIALS

This observational research was conducted out from April 2020 to September 2020 at the hospital of COVID-19, Rajshahi Medical College, Rajshahi and CDM Hospital in Rajshahi. All clinically suspected RT-PCR-confirmed patients were included and those not confirmed were exempted from this research. Cases were randomly chosen regardless of age and sex. For symptom analysis, comorbidities and hospital outcomes, patients hospitalized in the general ward were chosen, whereas those admitted to ICU were omitted from the symptom study. Data were gathered from patients or their families by comprehensive history, followed by complete physical exams and diagnostic evaluations and checked, confirmed and resulted. The coded data were examined using the SPSS software program after editing and coding.

RESULTS

A total of 627 individuals have been enrolled in this research, 552 in the Covid ward and 75 in ICU. Amongst the patients admitted to the Covid ward (552) there were 354 (64.13 percent) men and 198 (35.86 percent) women with a 1:0.56 ratio of men to women; young, hospitalized adults (19 to 50 years) and urban (62.86 percent) were more impacted (52.71 percent) than the rural (47.28 percent) population (Table I).

Table-I: Distribution of patients according to age, sex and residence (n= 552)

Demographics	Frequency (%)	
Age group	<19 years	24 (4.3)
	19-50 years	347 (62.86)
	>50 years	181 (32.78)
Sex	Male	354 (64.13)
	Female	198 (35.86)
Residence	Urban	291 (52.71)
	Rural	261 (47.28)

Overwhelmingly, those with the disease had fevers, coughs, and difficulty breathing. Other common symptoms were sore throats, headaches, and overall body discomfort. Table I & II lists the following.

Table-II: Distribution of patients according to presentation (n=552)

Symptoms	Frequency (%)
Fever	348 (63.04)
Cough	251 (45.47)
SOB	234 (42.39)
Sore throat	24 (4.34)

Headache	16 (2.8)
Generalized bodyache	13 (2.3)
Asymptomatic	46 (8.33)
Others	14 (2.3)

When it comes to co-existing diseases, 44.20% of patients have one or more co-existing diseases, whereas 55.79% of patients do not have any co-existing diseases. A sizable percentage of patients were found to have hypertension (17.57%) as well as diabetes (15.94%) (0.36 percent). Table III shows this information.

Table-III: Distribution of patients according to comorbidities (n=552)

Comorbidities	Frequency (%)
Hypertension (HTN)	97 (17.57)
Diabetes Mellitus (DM)	88 (15.94)
Ischemic Heart Disease (IHD)	31 (5.61)
Heart failure (HF)	03 (0.54)
Chronic Obstructive Airway Diseases (COAD)	31 (5.61)
Chronic kidney disease (CKD)	13 (2.3)
Cerebrovascular disease (CVD)	08 (1.44)
Cancer	02 (0.36)

Of those who went to the hospital, the following numbers survived: 44.95% of ICU patients and 96.48% of patients from the community, as opposed to 03.27% of community patients and 55.66% of ICU patients who died. There were more elderly fatalities (43; 72.88 percent) among the patients. Those who died of complications including hypertension, diabetes, and ischemic heart disease all had an over-consumption of sodium in their diets (42.37 percent, 37.28 percent and 16.94 percent respectively). Most of the patients, many of whom were old, had to be in the ICU after being admitted to the hospital. Out of all the people who were admitted, 11.96% were placed in the ICU (64 out of 75 i.e. 85.33 percent). The death rate in the ICU was notably higher than that in the community. There was a 3.2:1 ratio of male to female ICU deaths. Mortality rates in the ICU are elevated by having a comorbid illness, with primary conditions such as hypertension (42.37%) and diabetes (37.28%) the leading comorbidities, followed by IHD, COAD, CKD, and CVD. One in four ICU deaths included a lack of prior knowledge of comorbidities (Table IV, V, VI).

Table-IV: Distribution of Patients according to ICU Treatment and Outcome

Age Group of ICU Treated Patients (n=75, 11.96%)		<51 year	11 (14.66%)
		>51 year	64 (85.33%)
Outcome (n=627)	Recovery (n=568)	Covid Ward	534 (96.74%)
		ICU	34 (45.34 %)
	Death in Total cases (n=627)	Covid Ward	18 (2.87%)
		ICU	41 (6.53%)
	Comparison of death (n=59)	Covid Ward	18 (30.50%)
		ICU	41(69.49%)

Table-V: Distribution of mortality according to age, sex and comorbidities (n=59)

		Frequency (%)
Age group	<19 years	02 (3.38)
	19-50 years	14 (23.72)
	>50 years	43 (72.88)
Sex	Male	45 (76.27)
	Female	14 (23.72)
Comorbidities	Comorbidity present	43 (72.88)
	Comorbidity absent	16 (27.12)

Table-VI: Distribution of mortality according to the pattern of comorbidities (n=59)

Co-morbidity in dead patients	Comorbidities	Frequency (%)
Present (n=43)	HTN	25 (42.37)
	DM	22 (37.28)
	IHD	10 (16.94)
	COAD	07 (11.86)
	CKD	04 (6.77)

	CVD	04 (6.77)
	Others	04 (6.77)
Absent (n=16)		16 (27.11)

DISCUSSION

The research comprised a total of 627 patients (552 from Covid ward and 75 from ICU), and contained demographic and clinical data, as well as relevant information about the effect of co-morbidity on COVID-19 illness prognosis. In our research, adult patients were most impacted in particular by the economically productive age range 19-50 (62.86 percent), followed by the elderly population (32.78 percent). The proportion of children under 19 with confirmed COVID-19 cases is much lower (4.3%) than the normal population percentage. These results were strongly linked to Dominic Cortis's evaluation, which comprised three research. Two investigations were by Zhang, Guan *et al*. [8]. From China and another by Korea Centers for Disease Control and Prevention from South Korea. These investigations have shown that the proportion of young people with confirmed cases of COVID-19 is far below the normal population. The percentage of confirmed juvenile cases in COVID-19 (age group 0-14 years:) is lower in China than in South Korea (1.55%, 0.89%) (4.04 percent). In all 3 surveys, the majority population was 15 to 64years (76.93%, 83.98% in China and 78.60% in Korea), followed by the elderly (21.53 percent,15.13 percent in China and 17.36 percent in S.Korea) [9]. The age distribution of all patients with 61.5 percent <60 years old and others <60 years old was shown by a research carried out in China; this is consistent with our findings (67.16 percent in below 50 group vs 32.78 percent in above 50 groups) [10]. A research is done in India revealed that the 21–50 age group makes up the largest percentage (60%) of all cases followed by those under the age of 20, which accounts for about 13% of instances [11. This research has a divergence from our study as well as from China and South Korean studies on the positive nature of younger people's Covid-19. As far as sex distribution was concerned, Covid 19 discovered 39.7 percent female and 60.3 percent male to be positive in research that included a total of 5,700 patients admitted to 12 different hospitals in the USA [12].

In another research in India, 66 percent of the overall positive cases contribute to males. A research in shows that women are half as susceptible to COVID-19 infection as males [13]. These findings closely reflect the results of our research (male 64.13 percent and female 35.86 percent). Our research showed that the urban population (52.71%) was more impacted than the rural population (47.28 percent). There may be various reasons for the connection between metropolitan environments and coronavirus, stressing density, connectedness and crowded living situations. Concerning this research, most patients had a fever (63.04%), cough (45.47%), and shortness of breath (42.39%).

The less prevalent symptoms in a small group of patients were sore throat (4.34 percent), headache (2.8 percent), and chest discomfort, stomach pain, diarrhea, vomit, blood, and psychosis. Asymptomatic patients accounted for 8.33%. In a meta-analysis, seven articles published between the 24th of January and 16th of March 2020 show that the predominant symptoms were fever, (88.8%), followed by dry cough, (33%), productive tiredness (28.5%), muscle ache, diarrhea (4.4%), nausea (4.0%), rhinorrhea (3.2%), chest and abdominal pain (4.4%), nausea (4.2%). (0.15 percent) [4, 14]. Similarly, in-hospital research from Wuhan, China fever (98%), cough (76%), dyspnoea (55%), myalgia and tiredness (44%), sputum (28%), headache (8%), haemoptysis (5%) and diarrhea (3%) are frequent symptoms, respectively [15]. Similar results were observed in the previous metaanalysis where the most common clinical symptoms were fever (91.3%), followed by cough (67.7%), tiredness (51.0%) and dyspnea (30.4 percent) [16]. These research closely corresponded to the results of this investigation.

With comorbidity, 44.24% of patients had one or more comorbidities and 55.79% were isolated. Common concomitant conditions have been identified as follows: HTN (17,57%), DM (15,94%), IHD (5.61%), COAD (5.61%), CKD (2.3%), CVD (1.44%), Heart failure (0.54%) and Cancer (0.36 percent). In a meta-analyzed method, as above, hypertension (15.8%) was found to be the most common comorbidity, followed by other cardiovascular and cerebrovascular conditions (11.7%), mainly diabetes (9.4%), co-existing infections such as HIV and Hepatitis B (1.5%), malignancy (1.5%), respiratory system disorders such as COPD and others (1.4%), R. (0.01 percent) [17]. In a retrospective, multi-center research, 48 percent of patients had comorbidities, the most frequent of these being hypertension (30%), followed by diabetes (19%) and coronary heart disease (8 percent) [18]. 12% of patients adults were underlying in population-based monitoring of laboratory-confirmed COVID-19-assigned hospitalizations in America; most prevalent were hypertension (49.7%), obesity (48.3%), chronic lung disease (33.6%), diabetes mellitus (28.3%) and cardiovascular disease (27.8 percent) [19]. Our research (hypertension, coronary artery disease and Diabetes as major comorbidity), however, the third study showed that obesity is significant comorbidity not included in our analysis.

In our research, 96,8% of patients receiving covde and 45.34% of patients receiving ICU were unincidental whereas 2,87% of patients receiving covide and 6,53% of patients admitted to ICU came to an end. These matches the two studies below. By October 2020, about 10 percent of the world's population may have been infected with total IFR of

an estimated 0,15% to 0,2% (0,03% to 0,04% in those < 70 years of age) [20]. In another research, about 80% of COVID-19 patients lead to the complete recovery of the disease without hospitalizations or procedures. 5 Among our research, mortality in older patients was more prevalent (n=43; 72.88%). A total of 75 patients required ICU care, 11.96% of the total cases, most of them elderly (64 out of 75 i.e. 85.33 percent). Out of overall mortality, the mortality rate in ICU was significantly greater than in COVID (69.49 percent vs 30.50 percent). These findings are consistent with research carried out in other centers.

COVID-19 may cause serious illness leading to ICU admission and mortality in particular in older patients with comorbidities. The CDC states that 8 out of 10 recorded fatalities occurred in people aged 65 and older in the United States. 5 According to the CDC study, evidence from China showed that older individuals, especially those who have severe underlying illnesses, are at greater risk of serious disease and mortality linked with COVID-19 than younger people. COVID-19 instances in the United States in the same report, A total of 31 percent of cases, 45% of hospitals, 53% of ICU admissions and 80% of COVID-19 fatalities among people aged 65 years, were the greatest proportion of serious outcomes among those aged 85 years or older [21]. Individuals under 65, even in pandemic epicenters, have a low risk of mortality and death in people under 65, without any underlying illnesses, which is uncommon [22]. In our research, ICU mortality was high in individuals with one or more co-morbid diseases; hypertension (42.37 percent) and diabetes (37.28 percent) were the main comorbidities, followed by IHD, COAD, CKD and CVD. In 27.11 percent of mortality, no comorbidity was identified. In Italy, only 12% of death certificates showed direct COVID-19 causation, whereas 88% identified at least one co-morbidity in deaths [23, 24]. In New York, according to the State Department of Health, slightly over 86 percent of the COVID-19 fatalities recorded included at least one comorbidity. Hypertension was the main comorbidity in 55.4 percent of all fatalities. Other 10 most frequent comorbidities of COVID-19 deaths were diabetes (37.3%), hyperlipidemia (18.5%), coronary artery disease (12.4%), renal disease (11.0%), dementia (9.1%), chronic lung obstruction (8.3%), cancer (8.1%), atrial fibrillation (7.1 percent), and heart failure (7.1 percent) [24]. Hyperlipidemia and dementia have not been addressed in our treatment.

CONCLUSION

In our research, patients with HTN, DM and COAD exhibit higher death rates than the New York City study. Most of the patients in our environment suffer from fever, cough and respiratory distress. The elderly and those with one or more comorbid conditions showed poor results.

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