Outcome of coronavirus disease 2019 in relation to duration of hospital stay and locality in a tertiary hospital of Bangladesh

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Background
The global coronavirus disease 2019 (COVID-19) pandemic has claimed 17 lac deaths and infected populations disproportionately across the world. Rural population was in the high-risk category regarding prevalence and mortality, as there are high-risk patients such as elderly, comorbid patients, lack of health care facilities, and poor rural communications, all being contributing factors. So, the objective of the present study was to observe the relation of locality and duration of hospital stay with the outcome in our context.

Materials and methods
The study was conducted in a COVID Unit of Chattogram Maa-O-Shishu Hospital, Chattogram, Bangladesh. A total of 980 patients' data were taken and analyzed from early June to August 2020, and eight patients' data were excluded owing to incomplete records. Suspected and confirmed cases were detected according to RT PCR report. All demographic data, area of locality, and outcome were recorded and analyzed by software SPSS 20.

Results
Among 972 cases, 24.4% (*N*=237) were found to be RT PCR positive, whereas 75.6% (*N*=735) were treated as suspected cases. Most patients belonged to (74.4%, *N*=723) an urban area, whereas (25.6%, *N*=249) were from a rural area. Overall, 52 (21.94%) patients were found to be RT PCR positive from the rural area and rest were from the urban area. Death rate was 12.75% (*N*=124). Most patients stayed less than 5 days at the hospital (42.07%, *N*=409). Most were suspected cases (82.2%, *N*=336), and the rest were positive cases (17.8%, *N*=73). Death rate was almost equal (13.92%, *N*=33) among RT PCR positive cases (*N*=237 cases) in compare with 12.38% (*N*=91) among suspected cases. Death rate was lower in the rural area (29.83%, *N*=37) in contrary to in the urban area (70.17%, *N*=87). Most deaths were in the early hospital stay group, which were related to diseases severity, delayed attendance to hospital, and early discharge on request.

Conclusion
As COVID-19 is a new disease, new experimental treatment options were frequently used and regularly data was changing and accepted across the globe. As covid 19 mortality is more in elder group of populations, so we should accentuate the rural population, including elderly comorbid patients should be thoroughly screened, referred early to the hospital, cautiously discharged, and also ensure their regular follow-up visits after discharge to improve the outcome and reduce the mortality.

Keywords:
discharge on request (DOR), length o stay (LoS), reverse transcriptas polymerase chain reaction (RT PCR)

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Introduction

The recent outbreak of coronavirus disease 2019 (COVID-19) is sweeping around the global world; it has been labeled as a pandemic and threatening lives, owing to extensive deaths. It is an infectious disease caused by a coronavirus. It was first identified in 1965, causing common cold in people and animals including bats, camels, and cattle, but new concerns about it enhanced after its first detection in humans in Wuhan, China in late 2019. As we could not think about the sovereignty of the viruses initially, we are still fighting to know about its pathogenesis, lethality, and treatment also. The massive movement of people from and between the Asian region and other parts of the world increased the geographical spreading of contagion during the outbreak [1].

It was unimaginary for us, as it threatened the world and caused frightful situation, infecting even one lac

people daily in several countries. Not any infection but COVID has affected globally around 220 countries, claiming around 17 lac people and infected around seven crore people till now. USA and India are the worst affected countries. Bangladesh was among the 25 most affected countries, facing risk to the seventh most populous countries in the world. Now, globally second wave is running in part of the world, causing new impedance to economy and daily activities. Some third world countries like Bangladesh have been suffering from persistent low-grade infections for a long time. Rural people are more vulnerable to spread of coronavirus, as well as its enhanced severity. Lack of education and scarcity of health care facilities all were the contributing factors.

Bangladesh is a densely populated country, and majority of the patients live in rural areas, so we had very much concern regarding the rise of COVID outbreak. Lack of health resources, limited healthcare providers, scarcity of available RT PCRs facilities, poor awareness, and poor transportation from remote areas to a specialized hospital, all were the contributing factors regarding poor management. Limited information is available between outcome and hospital stay and catastrophes in urban or rural areas. Here, we tried to assess the association between outcome and hospital stay and also relation to outcome with area of predominant localizations such as urban or rural area.

Materials and methods

This was a retrospective observational study conducted in a COVID unit of Chattogram Maa-O-Shishu Hospital, which was prepared as a dedicated COVID unit in a separate new building including ICU facilities during COVID era in early June 2020. A total of 980 patients' data were analyzed up to August 2019, and eight patients' data were excluded due to incomplete records. Suspected and confirmed cases were detected according to RT PCR report, clinical symptoms, and suspicion. All patients were admitted according to severity and vacancy in different units. All demographic data, area of locality, and outcome were recorded and analyzed by software SPSS (Version 20.0. Armonk, NY: IBM Corp).

Results

A total of 972 patients' data were analyzed, and 24.4% (*N*=237) were found RT PCR positive, whereas 75.6% (*N*=735) were treated as suspected cases. Most patients belonged (74.4%, *N*=723) to an urban area, whereas 25.6% (*N*=249) were from a rural area. Overall, 21.94% (*N*=52) of patients were found RT PCR positive from the rural area and rest were from an urban area. Almost half of the patients (49.2%, *N*=478) were treated in a COVID ward, and least number of patients (3.9%, *N*=38) required ICU. Death rate was 12.75% (*N*=124) according to data in June to August 2019. Majority of the deaths ensued in COVID ward (38.7%, *N*=48) as almost half of the patients were treated in ward (*N*=478) compared with 26.6% (*N*=38) died in High Dependency Unit, and death rate was small in COVID ICU (15.3%, *N*=19).

Majority of the patients remained less than 5 days in the hospital (42.07%, *N*=409), and from them, most were suspected cases (82.2%, *N*=336) and rest were positive cases (17.8%, *N*=73).

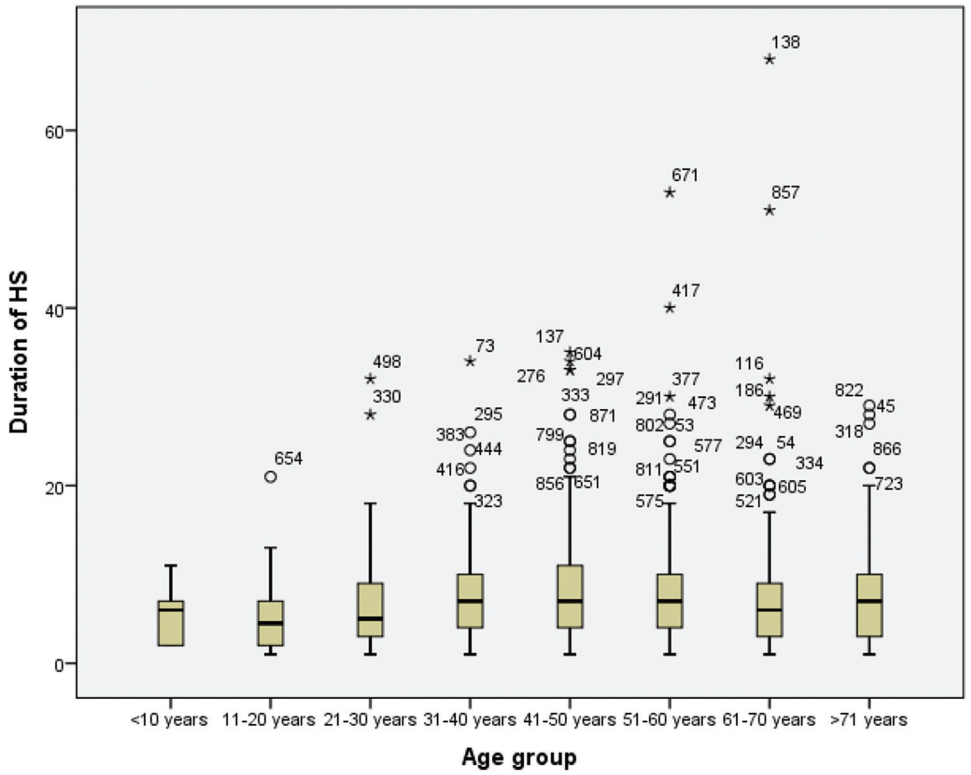
Death rate was almost equal (13.92%, *N*=33) among RT PCR positive cases (total of 237 cases) compare with among suspected cases (12.38%, *N*=91) (Fig. 1 and Tables 1–4).

Discussion

Death rate was 12.75% (*N*=124) according to our study. Mean±SD hospital stay was 7.72±6.5 days. Majority of the patients (42%, *N*=409) stayed in the hospital for less than 5 days, and least number of patients (1.13%, *N*=11) required long time more than 31 days to recover. Most of the death ensued earlier after arrivals to the hospital in group bearing less than 5 days of stay, representing 72.5% (*N*=90). Early death may be owing to delayed arrival, disease severity, presence of comorbidities, lack of proper equipment facility such as high-flow oxygen, COVID ignorance, hospital bed crisis, and fear of COVID being the reason. Only 1.6% (*N*=2) died after long-term admission, that is, more than 30 days, owing to diseases severity.

Death rate was little bit more initially, as peak time of COVID in our country was in that time and also there was a lack of dedicated COVID hospital facilities. Delayed hospital arrival with worst condition and lack of seat vacancy, and social stigmata, all were responsible for high death rate. In one study in our country's largest COVID hospital, mortality rate was almost similar to 10%. The mean±SD duration of total hospital stay was 6.1±3.67 days in death cases and 7.97 ±5.79 days in alive cases, and the mean duration of total hospital stay was not statistically significant ($P>0.05$) between death and alive cases [2]. In our study, mean

Figure 1



Stem leaf plot between duration of hospital stay and age group.

Table 1 Distribution of locality

	Outcome					Total	*P* value
	Death	Discharge on request	Discharge on risk bond	Discharge with advice	Transfer		
Locality							
Rural	37	146	30	32	4	249	0.001
Urban	87	494	68	70	4	723	
Total	124	640	98	102	8	972	

Table 2 Relation between type of coronavirus disease 2019 and locality

	Type of COVID-19		Total
	Positive	Suspected	
Locality			
Rural	52	197	249
% within locality	20.9	79.1	100.0
% of total	5.3	20.3	25.6
Urban	185	538	723
% within locality	25.6	74.4	100.0
% of total	19.0	55.3	74.4
Total			
Count	237	735	972
% within locality	24.4	75.6	100.0
% of total	24.4	75.6	100.0

COVID-19, coronavirus disease 2019.

±SD duration of total hospital stay was 5.17±7.56 days in death cases and 8.34±7.43 days in alive cases, and the mean duration of total hospital stay was statistically significant (*P*=0.00). Death rate was little bit lower in rural area (29.83%, *N*=37) in contrary to 70.17% (*N*=87) in an urban area, which indicates that rural people were more aware about the diseases severity and took benefit of early attending the hospital.

In one American study, in the rural counties, the mean prevalence of COVID-19 increased from 3.6 per 100 000 population to 43.6 per 100 000 within 3 weeks from April 3 to April 22, 2020. In the urban counties, the median prevalence of COVID-19 increased from 10.1 per 100 000 population to 107.6 per 100 000 within the same period [3].

Another study revealed since early March, the average daily increase in the COVID-19 mortality rate has been significantly higher in rural area counties with the highest percent of black and Hispanic populations. Compared with counties in the bottom quartile,

Table 3 Relation between outcome and duration of hospital stay

Outcome	Duration hospital stay							Total	*P* value
	<5 days	6–10 days	11–15 days	16–20 days	21–25 days	26–30 days	>31 days		
Death	90	20	7	5	0	0	2	124	
DOR	197	276	98	37	15	10	7	640	
DORB	77	15	5	0	0	0	1	98	0.001
DWA	39	42	9	4	5	2	1	102	
Transfer	6	1	1	0	0	0	0	8	
Total	409	354	120	46	20	12	11	972	

DOR, discharge on request; DORB, discharge on risk bond; DWA, discharged with advice.

Table 4 Relation between site of care and type of coronavirus disease 2019

Type of COVID-19	Site of care				Total	*P* value
	Cabin	COVID-19 Ward	HDU	ICU		
Positive						
Outcome						
Death	8	9	13	3	33	0.001
DOR	123	61	3	4	191	
DORB	2	9	0	2	13	
Total	133	79	16	9	237	
Suspected						
Outcome						
Death	16	39	20	16	91	
DOR	239	191	12	7	449	
DORB	11	60	9	5	85	
DWA	0	101	0	1	102	
Transfer	0	8	0	0	8	
Total	266	399	41	29	735	

COVID-19, coronavirus disease 2019; DOR, discharge on request; DORB, discharge on risk bond; DWA, discharged with advice; HDU, High Dependency Unit.

counties in the top quartile of percent black have an average daily increase that is 70% higher (IRR=1.70, CI: 1.48–1.95, $P<0.001$), and counties in the top quartile of percent Hispanic have an average daily increase that is 50% higher (IRR=1.50, CI: 1.33–1.69, $P<0.001$), net of covariates [4].

Unfortunately, a huge number of patients were discharged on request as prematurely (65.8%, *N*=640), probably owing to financial constraints and lack of awareness. Only 10.49% (*N*=102) cases were discharged according to our COVID protocol. On-request discharge was little in rural people (22.81%, *N*=146) compared with 77% (*N*=494) in urban people. Urban people got more DOR, as they realized the availability of all facilities in the urban area and could attend further if required, so they took early discharge not abiding protocol and went out from hospital just after relieving symptoms, which raised the mortality in this group.

Mortality rate in ICU and High Dependency Unit in this study was 15.3 and 26.6%, respectively. This result was nearly similar to global studies. Analysis of the relevant 15 studies among countries worst hit by the pandemic showed mortality rate in ICU was 25.7%, compare with mortality in China being 37.7% [5]. Another US study revealed mortality rates for those in the 18-to-65-year age group and older-than-65-year age group that did not receive mechanical ventilation were 1.98 and 26.6%, respectively. There were no deaths in the younger-than-18 age group [6].

Analysis of the 52 studies reported majority from China (46/52), median hospital LoS ranged from 4 to 53 days within China and 4 to 21 days outside of China, across 45 studies. ICU LoS was reported by eight studies–four each within and outside China–with median values ranging from 6 to 12 and 4 to 19 days, respectively [7].

Limitations

As data were taken in the peak stage of COVID in our country and within the first 3 months of establishment of COVID hospital causing huge rush to the COVID unit, important data about comorbidity could not be recorded. So, a relationship between comorbidity and outcome could not be analyzed.

Conclusion

After several weeks of low transmission of COVID, many countries are experiencing now a second wave. So, we should get accustomed to a so-called new normal state, emphasizing physical distancing aggressively and steps for controlling the spread, ensuring proper management, as well as strengthening health services at all levels. As majority of our people lives in rural areas and they are deprived of all other opportunities comparative to those living in urban areas, so we should focus on these groups of people and ensure proper treatment to minimize mortality in rural elderly group.

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Conflicts of interest

There are no conflicts of interest.

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