Original Article

Characteristics of suspected COVID-19 patients admitted with non-COVID illness in department of Endocrinology, BIRDEM General Hospital, Dhaka

Afsana F[a], Parvez AA[b], Nahar J[c], Islam MA[c], Hossain KN[d], Rouf RSB[d], Shefin SM[a], Amin MF[e], Ashrafuzzaman SM[f], Pathan MF[f]

ABSTRACT

Background: *Since March 2019 the outbreak of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged in Bangladesh. There is variable presentation of COVID-19. Though SARS-CoV-2 primarily involves respiratory system, as time passing on it is evident that it can affect any other system including gastrointestinal, cardiovascular and neurological system. This study described the characteristics of the patients admitted in Department of Endocrinology, BIRDEM General Hospital with non-COVID illness and later revealed positive for SARS-CoV-2.*

Methods*: This observational study was conducted during the period of 13th April to 14thOctober, 2020.Data of all patients admitted in Department of Endocrinology, BIRDEM General Hospital during this period was retractedretrospectively from hospital electronic medical records with prior permission from institutional head. Though admitted for non-COVID illness, patientshavingsymptoms or supportive lab investigations of COVID-19 were advised RT-PCR for SARS-CoV-2. All hospital records of these suspected COVID-19 cases wererecoded and analyzed by SPSS version 20.*

Results:*Total patients were 63. Among them 21(33.3%) patients were admitted with uncontrolled diabetes (DM),19(30.2%) had other endocrinopathies(later query revealed history of fever),8(9.5%) had newly detected DM,11(7.5%)had hypoglycemia,6(9.6%) had general weakness. Though all study subjects were advised to do RT-PCR for COVID, 22(34.9%) refused the test either due to symptom denial or due to cost of the test and 24(38.1%) become positive.*

Conclusion: *Non-critically ill COVID-19 patients had variable clinical characteristics. This study shows that uncontrolled diabetes mellitus, newly detected diabetes and hypoglycemia are found in patients with COVID-19 and may not have typical clinical features.*

Key words:*COVID-19, RT-PCR, SARS-CoV-2, characteristics.*

(BIRDEM Med J 2020; 10, COVID Supplement: 29-32)

Author information

a. Faria Afsana, Sultana Marufa Shefin, Assistant Professor, Department of Endocrinology, BIRDEM General Hospital, Dhaka, Bangladesh.
b. Abdullah Al Parvez, SMO, Department of Endocrinology, BIRDEM General Hospital, Dhaka, Bangladesh.
c. Jubaida Nahar, Mohammad Aminulislam, Phase B Resident, Department of Endocrinology, BIRDEM General Hospital, Dhaka, Bangladesh.
d. Kazi Nazmul Hossain, Rushda Sharmin Binte Rouf, Registrar, Department of Endocrinology, BIRDEM General Hospital, Dhaka, Bangladesh.
e. Mohammad Feroz Amin, Associate Professor, Department of Endocrinology, BIRDEM General Hospital, Dhaka, Bangladesh.
f. S.M. Ashrafuzzaman, Md. Faruque Pathan, Professor, Department of Endocrinology, BIRDEM General Hospital, Dhaka, Bangladesh.

Address of correspondence: Faria Afsana, Assistant Professor, Assistant Professor, Department of Endocrinology, BIRDEM General Hospital, Dhaka, Bangladesh. Email: fariaafsana@yahoo.com

Received: November 19, 2020
Revision received: December 1, 2020
Accepted: December 15, 2020

INTRODUCTION

In December 2019, 1st case of coronavirus SARS-CoV-2 was identified at Wuhan, China. Later it revealed as a cause of an outbreak of severe pneumonia from January 2020. Since then, the spread of COVID-19 has increased globally affecting each and every country. World Health Organization declared it as a pandemic on 11 March. By 15 April, more than 1900000 cases and 123000 deaths had been reported worldwide.[1]Though the disease first presented as a disease with fever and respiratory symptoms, such as cough and shortness of breath and these patients were only selected for COVID testing, but later on it was evident that it was only the typical cases and many cases were missed as one widely cited modeling study concluded that up to 86% of cases might have been missed in China[2] and reports of patients with unusual presenting symptoms are rising

worldwide.People with diabetes are at an increased risk for severe COVID-19.It is critical to support people with diabetes by helping them effectively manage their condition and minimize exposure to the virus. Since the very beginning of the SARS-CoV-2 pandemic, diabetes emerged as one of the most common comorbidities and a potential driver of poor outcomes.[3]A case series report shows presence of gastrointestinal symptoms in 2-40% of patientsand diarrhoea can be the initial presentation of COVID-19. The pathogenesis of such symptoms either produced directly by infecting the gastrointestinal tract or indirectly by neurological involvement or through cytokine production is unclear.[4]Few case studies from China and the US found neurological involvement among patients with COVID-19, including stroke, dizziness, headache, musculoskeletal disturbance, altered mental state, Guillain-Barré syndrome or acute necrotising encephalopathy,though there was no evidence of direct viral invasion into the brain.[5-7]Several patients with COVID-19 present with cardiovascular events during or after the period of illness specially in patients with severe infections may develop myocarditis,myopericarditis with reduced systolic function, cardiac arrhythmias, heart failure.[4] COVID-19 is associated with a hypercoagulable state as evident from a retrospective cohort study from China, probably increasing the risk for venous thromboembolic events including pulmonary embolus.[8]There are several cases of asymptomatic infection or cases with milder symptoms. Risk of transmission by asymptomatic COVID-19 cases need to bequantified. Similar viral loads have been documented in the upper respiratory tract of both symptomatic and asymptomatic cases.[9]So, extensive RT-PCR testing for COVID-19 disease need to be done to identify all cases.

This retrospective observational study was conducted among patients admitted in department of Endocrinology, BIRDEM General Hospital,Dhaka, Bangladesh, who got admitted with non-COVID illness but later on develop symptoms or suspected laboratory reports suggestive of COVID-19.These patients were advised RT-PCR for SAES-CoV-2. All hospital records of these suspected COVID-19 cases were analyzed for this study.

METHODS

This retrospective observational study was conducted during the period of 13th April to 14th October, 2020. Data of all patients admitted in Department of Endocrinology, BIRDEM General Hospital during this period was retracted from hospital electronic medical records with prior permission from institutional head. Detail history of all the patients admitted during this period was taken.Among the admitted patients, those having suspected symptoms (fever, cough, bodyache, excessive weakness, loose motion) or supportive laboratory investigations (raised ferretin, CRP , LDH or pneumonia in chest x-ray)in favour of COVID-19 (N=63), were advised RT-PCR for SARS-CoV-2. All hospital records of these suspected COVID-19 cases were analyzed for this study. Few patients refused to do the test either due to cost of the test or denial of symptoms. All positive cases were transferred to COVID-dedicated unit for further management.As all the x-ray reports were not found in hospital records, it was not possible to analyze the chest x-ray report finding. Data were analyzed by SPSS version 20.

RESULTS

Total patients were 63including 32 (50.8%) male.Mean age was 56.08 ±15.7years. Table I describes the clinical and biochemical parameters of study subjects. Among the study subjects, 21(33.3%) were admitted with uncontrolled diabetes (previously diagnosed as diabetic).Six (9.5%) patients were admitted with newly detected uncontrolled diabetes and all 27(42.8%) patients were admitted for control of diabetes. Symptomatic description of purpose of admission is mentioned in Table II. Uncontrolled diabetes mellitus was found in 30(48.0%) cases. A total of 11(17.5%) patients were admitted with hypoglycemia. There was overlap of admission causes especially, electrolyte imbalance in form of hyponatremia and hypokalemia in 8 (12.8%) patients.The mean (±SD) ofCRP(mg/l), LDH(u/l), serum ferretin(ng/ml) and D-dimer(ng/ml) were raised [69.31(65.49), 462.79(192.90), 356.98 (199.47) &872(531.11)respectively].All of these patients advised for RT-PCR for COVID-19, among them 24(38.1%) become positive and 17(27.0%) revealed negative. Rest 22(34.9%) refused the test either due to symptom denial or due to cost of the test (all of these patients were later referred to government COVID-dedicated hospital for testing) (Table III). The patients who refused COVID testing were contacted after hospital discharge over phone for a follow up, which revealed no one did the test and one patient expired few days after hospital discharge. While comparing the parameters of COVID-19 among test positive and negative cases it revealed that only serum ferretin level was significantly different among these two groups but other parameters including LDH,CRP, D-dimer were not significantly different among them (Table IV).

Table I Characteristics of clinical and biochemical parameters of study subjects (N=63)

Parameter	Mean (±SD)
Age(years)	56.08(15.75)
Pulse(b/min)	82.58(12.88)
Systolic BP(mmHg)	129.84(22.78)
Diastolic BP(mmHg)	72.71(7.67)
FBS(mmol/l)	10.56(3.73)
PPBS(mmol/l)	11.61(3.11)
Hb(gm/dl)	11.51(2.24)
Total WBC count($x10^9$)	10.32(4.46)
Neutrophil count(%)	75.12(13.21)
Lymphocyte count(%)	18.94(12.02)
Platelet count ($mm3x10^9$)	2.66(107.71)
ESR (mm in 1st hour)	40.23(24.88)
CRP(mg/l)	69.31(65.49)
Ferretin(ng/ml)	356.98(199.47)
D-Dimer(ng/ml)	872(531.11)
LDH(u/l)	462.79(192.90)
S.Creatinine (mg/dl)	1.39(0.86)
HbA1c (%)	9.54(4.32)
S.Sodium (meq/l)	132.43(7.04)
S. Potassium(meq/L)	4.080(0.80)
TCO2	23.37(3.71)

Table II Purpose of hospital admission among the study subjects (N=63)

Cause of admission*	N (%)	Total cases of uncontrolled diabetes
Uncontrolled diabetes (previously diagnosed)	21 (33.3)	30 (48.0)
Newly detected uncontrolled diabetes	6 (9.5)	
Other endocrinopathies (recent H/O fever)	19 (30.2)	
Hypoglycemia	11 (17.5)	
General weakness and uncontrolled diabetes	3 (4.8)	
Diarrhoea	2 (3.2)	
Electrolyte imbalance (hyponatremia/hypokalemia)	8 (12.8)	

*(There is overlap of purpose of hospitalization)

Table III RT-PCR SARS-CoV-2 test result among study subjects (N=63)

Result of RT-PCR	N(%)
Positive	24 (38.1)
Negative	17 (27.0)
Refused	22 (34.9)

Table IV Comparison of different parameters between COVID positive and negative cases

Variable	COVID positive	COVID negative	P value
CRP (mean±SD)	97.12(67.67)	40.50(44.45)	0.056
S.Ferretin(mean±SD)	6.38(670.46)	4.18(411.66)	0.026
LDH(mean±SD)	432.94(160.57)	501.14(239.60)	0.182
D-dimer(mean±SD)	1044.21(1283.511)	332.67(1592.79)	0.697

DISCUSSION

This study reveals that uncontrolled diabetes is a common association with COVID-19. Presentations of COVID-19 are variable and ranges from asymptomatic or mild disease to severe illness and mortality. Common symptoms are fever and respiratory symptoms.[10]Other non-specific symptoms such as myalgia, headaches, rhinorrhoea, anosmia, nasal congestion, conjunctivitis, gastrointestinal symptoms and neurological symptoms have been reported but are comparatively infrequent. The top priority for every diabetic individual is to achieve the glycemic target. As noted already, COVID-19 may have a role in the dysregulation of the glycaemic control. These individuals are therefore more prone to require hospitalisation to achieve the target.[10]In the present study, patients were admitted with uncontrolled

diabetes (either previously diagnosed or newly diagnosed) but they did not have respiratory symptoms, so it may happen that they were actually the mild or asymptomatic cases but due to COVID-19 infection developed severe hyperglycemia and required admission.

Common laboratory findings of COVID-19 include leukopenia and lymphopenia.[10] All of this study subjects had lymphopenia giving rise the suspicion of COVID-19, inspite of not having typical respiratory symptoms. High blood concentrations of inflammatory markers (ie, C-reactive protein and ferritin), a high neutrophil-to-lymphocyte ratio and increased blood concentrations of inflammatory cytokines and chemokines have been associated with both COVID-19 severity and death.[11]Serum markers of inflammation done in all these study subjects revealing a rise in (mean±SD) of CRP, ferretin and LDH level. One of the more common responses to disaster is the psychological defense of denial—the problem doesnot exist. COVID-19 demonstrates denial is more. Among the study subjects of present study 34.9% denied to do the study as they donot believe that they may develop the disease and that was further strengthen by the belief that they did not have the typical respiratory symptoms of SARS-CoV-2 infection.It is recommended that in handling cases of non-compliance, it would be sufficient to explore the reasons why the patient is refusing testing. Since very little is known about COVID, the pathogen that causes COVID-19, the patient's refusal may have stemmed from incorrect beliefs.[12] Chest x-ray reports are not found in hospital record in most of the study subjects, so it was not possible to analyze the chest x-ray report finding which is a limitation of the present study.

Conclusion

This study shows that uncontrolled diabetes mellitus, newly detected diabetes and hypoglycemia are found in patients with COVID-19 and are non-typical presentation of COVID-19 among many patients.

Conflict of interest: Nothing to declare.

Funding: None.

Authors' contribution: FA planed the study, analyzed data, drafted manuscript. AAP helped in data handling and extraction of data from hospital record and patient follow up after hospital discharge. JN, MAI helped in data compilation. KNH,RSBR, SMS, MFA, SMA, MFP reviewed and edited manuscript. All authors read and approved final manuscript.

REFERENCES

1. World Health Organization. WHO director-general's opening remarks at the media briefing on covid-19. 11 March 2020. https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19—-11-march-2020
2. Li R, Pei S,Chen B, Song Y, Zhang T, Yang W. Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV2). *Science* 01 May 2020; 368 (6490): 489-93.
3. Bornstein SR, Rubino F, Khunti K,Mingrone G, Hopkins D, Birkenfeld AL,et al.Practical recommendations for the management of diabetes in patients with COVID-19.Lancet Diabetes Endocrinol 2020; 8: 546-50.
4. Vetter P,Lan Vu D, L'Huillier AG, Schibler M, Kaiser L,Jacquerioz F.Clinical features of covid-19.BMJ 2020;369:m1470.
5. MaoL,WangM,ChenS,Quanwei He, Chang J, Hong C,et al Neurological manifestations of hospitalized patients with covid-19 in Wuhan, China: a retrospective case series study. SSRN 3544840 [Preprint]. 2020.
6. PoyiadjiN, ShahinG, NoujaimD, StoneM,PatelS,GriffithB. COVID-19-associated acute hemorrhagic necrotizing encephalopathy: CT and MRI features. *Radiology*2020*;* 201187.doi:10.1148/radiol.2020201187 pmid:32228363
7. LiY,WangM, ZhouYl. Acute cerebrovascular disease following covid-19: a single center, retrospective, observational study. *SSRN (*Preprint*)*.doi:10.2139/ssrn.3550025.
8. Zhou F, Yu T, Du R. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet2020;395:1054-62.
9. Hoehl S, Rabenau H, Berger A. Evidence of SARS-CoV-2 infection in returning travelers from Wuhan, China. N Engl J Med2020;382:1278-80.
10. CDC. 2019 Novel Coronavirus, Wuhan, China: Symptoms. CDC. Available at https://www.cdc.gov/coronavirus/2019-ncov/about/symptoms.html. January 26, 2020; Accessed: January 27, 2020.
11. Petrilli CM, Jones SA, Yang J, Rajagopalan H, O'Donnell L, Chernyak Y et al. Factors associated with hospitalization and critical illness among 4,103 patients with COVID-19 disease in New York City. BMJ 2020; published online April 11. https//:doi.org.10.1101/2020.04.08.32444366
12. Rubin R. First It Was Masks; Now Some Refuse Testing for SARS-CoV-2. JAMA Published online November 6, 2020,\editorial :https://jamanetwork.com