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Research Article

Laboratory Findings of COVID 19 Positive A Tertiary Care Hospital Study in Bangladesh

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Abstract

Background: The first COVID 19 patient was detected on the 8th March 2020in Bangladesh. The laboratory findings of COVID 19 patients of previous studies may be helpful in the treatment arena of COVID 19. We have very limited research-oriented data regarding the laboratory findings of COVID 19 patients.

Aim of the Study: The aim of this study was to assess the laboratory findings of COVID 19 suspected patients.

Methods: This was prospective observational study and it was conducted in the Department of Medicine, Sahabuddin Medical College Hospital, Gulshan, Dhaka, Bangladesh, during the period from November 2021 to March 2022. In total 126 COVID 19 suspected patients referred from government primary/secondary healthcare institutions were included as the study subjects. The ethical committee of the mentioned hospital was approved this study. All Data were collected, analyzed by using MS Office and SPSS version 23 programs as per need.

Results: In laboratory blood tests of the participants, we observed that, the mean (±SD) white blood cell (WBC), Neutrophil (N), Leukocytes (L) and S. Creatinine of the participants were found as 10.80 ± 8.99 X 109/L, 77.21 ± 47.54 X 109/L, 19.63 ± 11.83 X 109/L and 1.50 ± 2.36 respectively. Besides these, in electrolyte analysis the mean (±SD) Na+, K+ and Cl- of the participants were found as 139.50 ± 4.93, 3.68 ± 0.69 and 105.67 ± 5.86 mmol/L respectively. As per the laboratory findings 41% (n = 52) patients were defined as COVID 19 patients whereas the rest 59% (n = 74) were not positive. On the other hand, in RT-PCR test only 13% patients were detected as COVID 19 cases whereas the rest 87% were COVID 19 negative. Noted that, all the RT-PCR positive cases were previously detected Covid 19 positive by laboratory tests.

Conclusion: In this study, laboratory findings of suspected COVID 19 patients ensured the pre-detection of COVID 19 positive cases. Although RT-PCR test is considered as the gold standard for detecting COVID 19 patients, laboratory findings can play an important role in primary screening of COVID 19 suspected as well as positive cases.

Keywords: Laboratory Findings; Diagnosis; Covid-19; RT-PCR; Suspected Patients

Introduction

Like other infectious diseases, the laboratory findings of COVID19 patients of previous studies may be helpful in the treatment arena of COVID 19.On the 31st December 2019 in Wuhan, China, the novel corona virus was detected for the first time [1]. Besides this, In Bangladesh, the first case of Covid-19 was found on the 8th March, 2020 [2]. Generally, COVID 19 is transmitted through the respiratory droplets as well as the close contact of its patients [3]. In severe cases of COVID 19, acute respiratory distress syndrome, organ dysfunction, shock, acute kidney injury, acute cardiac injury and even death can be occurred [4]. Among COVID 19 cases, severe acute respiratory illness along with fever and respiratory symptoms, like shortness of breath, cough comprise the main clinical presentations [5]. In such situation, it becomes very difficult to differ the disease between COVID 19 and pneumonia and. Besides these, worldwide for several reasons during several season unusual manifestations, like' patients without respiratory symptoms' or only very mild symptoms are rising day by day [6]. In Bangladesh COVID19 pandemic had reached to all the 64 administrative districts by the 1st July, 2020, causing over 145,000 cases and 1,874 deaths which was very alarming [7]. So, to tackle such pandemic situation laboratory findings of COVID19 suspected patients of previous studies may be considered as one of the most effective tools.

Methodology

This prospective observational study was conducted in the Department of Medicine, Sahabuddin Medical College Hospital, Gulshan, Dhaka, Bangladesh during the period from November 2021 to March 2022.In total 126 COVID 19 suspected patients referred from government primary/secondary healthcare institutions were included as the study subjects. The study had been approved the ethical committee of the mentioned hospital. In this study several aged referred COVID 19 suspected patients from nearest government primary and secondary healthcare institutions were included as per the inclusion criteria. For those referred subjects flu emergency had been created for initial management. On the other hand, as per the exclusion criteria of this study, previously confirmed COVID 19 patients were excluded from this assessment. The final detection for novel COVID19 virus was performed in accordance with World Health Organization guidelines [8]. The patients were subjected to investigations including serum biochemistry, complete blood count (CBC), liver and kidney function test, electrolytes assessment, and chest radiograph as per need. As per necessity, arterial blood gases, the coagulation profile, markers of inflammation including procalcitonin, C-reactive protein, and serum ferritin were evaluated. The case records of all the patients were reviewed and all the laboratory findings, biochemical, clinical, radiological and management details were recorded. Besides these, details of each patient regarding clinical presentation demographic profile, severity, comorbidities, treatment methods, course during hospital stay and outcome were recorded. Data were processed and analyzed by using MS Office and SPSS version 23 programs as per need.

Results

In this current study, in analyzing the demographic status of the participants we observed that, among total 126 participants, 46% were male whereas the rest 54% were female. So female participants were dominating in number and the male-female ratio was 1:1.17. The highest number of the participants were form 41-50 years' age group which was 32%. Besides this, 12.7%, 17.5%, another 17.5%, 13.5% and 7.1% were from ≤ 30, 31-40, 41-50, 51-60, 61-70 and ≥ 70 years' age groups respectively. In laboratory blood tests of the participants, we observed that, the mean (± SD) White blood cell (WBC), Neutrophil (N), Leukocytes (L) and S. Creatinine of the participants were found as 10.80 ± 8.99 X 10^9/L, 77.21 ± 47.54 X10^9/L, 19.63 ± 11.83 X 10^9/L and 1.50 ± 2.36 respectively. Besides these, in electrolyte analysis the mean (± SD) Na^+, K^+ and Cl^- of the participants were found as 139.50 ± 4.93, 3.68 ± 0.69 and 105.67 ± 5.86 mmol/L respectively. As per thelaboratory findings 41% (n = 52) patients were defined as COVID 19 patients whereas the rest 59% (n = 74) were not positive. On the other hand, in RT-PCR test only 13% patients were detected as COVID 19 cases whereas the rest 87% were COVID 19 negative. Noted that, all the RT-PCR positive cases were previously detected COVID 19 positive by laboratory tests.

Discussion

The aim of this study was to assess the laboratory findings of COVID 19 positive &suspected patients. Among total 126 of our participants, 46% were male whereas the rest 54% were female. So female participants were dominating in number and the male-

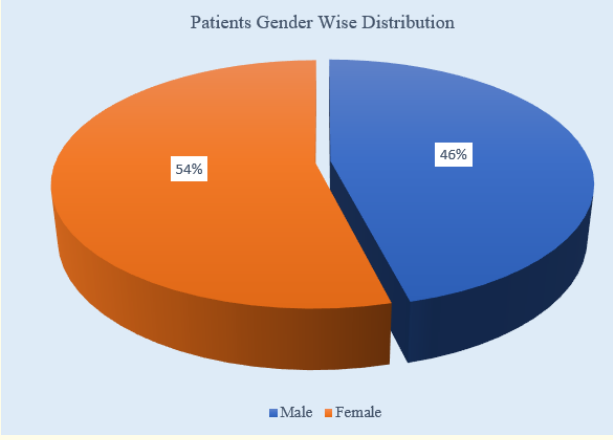

Figure 1: Patients Gender Wise Distribution (N = 126).

Characteristics	n	(%)
Gender distribution		
Male	58	46.0
Female	68	54.0
Age distribution		
≤ 30 yrs.	16	12.7
31-40 yrs.	22	17.5
41-50 yrs.	40	31.7
51-60 yrs.	22	17.5
61-70 yrs.	17	13.5
≥ 70 yrs.	9	7.1

Table 1: Demographic status of participants (N = 126).

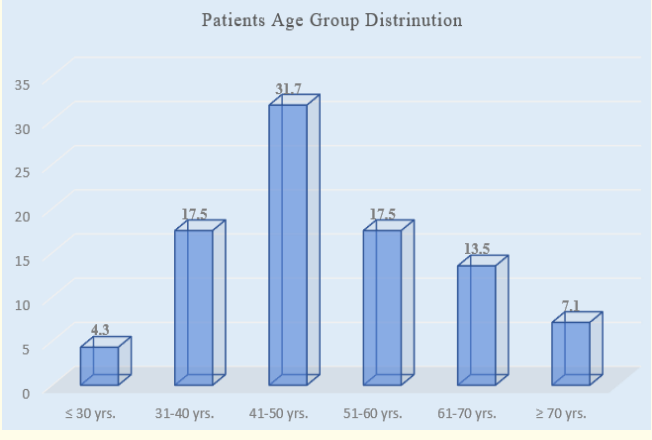

Figure 2: Patients Gender Wise Distribution (N = 126).

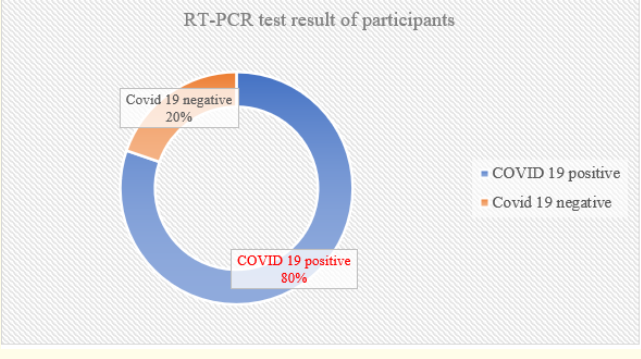

Figure 3: Laboratory detection of COVID 19 among participants except RT-PCR test (N = 126).

Characteristics	Mean ± SD
White blood cell (WBC)	10.80 ± 8.99
Neutrophil (N)	77.21 ± 47.54
Leukocytes (L)	19.63 ± 11.83
S. Creatinine	1.50 ± 2.36
SGPT	56.64 ± 66.54
SGOT	91.18 ± 96.32
S. Albumin	28.13 ± 7.87
Ferritin	410.10 ± 331.49
IL-6	92.09 ± 319.07
D-Dimer	606.04 ± 1395.36
CRP	47.20 ± 62.03
TSH	5.83 ± 0.00
S. Ph	1.25 ± 0.00
S. Calcium	6.70 ± 0.00
Trop_1	1.90 ± 3.82
S. Calcitonin	0.59 ± 0.53
LDH	255.71 ± 67.25
BUN	12.00 ± 0.00
Lactate	73.80 ± 11.12
Na^+	139.50 ± 4.93
K^+	3.68 ± 0.69
Cl^-	105.67 ± 5.86

Table 2: Laboratory findings of participants (N = 126).

RT-PCR report	n	(%)
Covid 19 positive	16	13.0
Covid 19 negative	110	87.0

Table 3: RT-PCR test result of participants (N = 126).

female ratio was 1:1.17. The highest number of the participants were form 41-50 years' age group which was 32%. But in another study [9]. the number of male participants was some higher than that of female. On the other hand, Xiao., *et al*. reported that, 301 COVID 19 patients, hospitalized at Tongji Hospital in Wuhan of China, the median age was 58 years and 51.2% were male [10]. In laboratory blood tests of the participants, we observed that, the mean (± SD) White blood cell (WBC), Neutrophil (N), Leukocytes (L) and S. Creatinine of the participants were found as 10.80 ± 8.99 X 10^9/L, 77.21 ± 47.54 X 10^9/L, 19.63 ± 11.83 X 10^9/L and 1.50 ± 2.36 respectively. Besides these, in electrolyte analysis the mean (± SD) Na+, K+ and Cl- of the participants were found as 139.50 ± 4.93, 3.68 ± 0.69 and 105.67 ± 5.86 mmol/L respectively. In a study it was reported that, WBC count at admission of COVID 19 suspected and positive patient is significantly correlated with death and higher level of WBC should be given more attention in treating of COVID 19 patients [11]. Some laboratory abnormalities include the decreased WBC (White blood cell) and lymphocyte, thrombocytopenia, neutrophilia, increased C-reactive protein (CRP), sedimentation rate (ESR), erythrocyte and abnormal procalciton in (PCT) in most of the patients [12]. On the other hand, in particular, the blood count of patients with COVID19 infection at diagnosis shows some alterations which correlate with the stage and severity of the disease [13]. The PLT (Platelet) count which was associated with the hypoxemia value has also been described as a predictive model of severity of the disease, with an accuracy of 96% [14]. Conversely, only a small fraction number of patients was found with thrombocytosis [15]. In another study, it was reported that, the best recognized haematological abnormality in COVID 10 affected COVID19 is lymphopenia, which is seen in up to 85% of severe cases with the severity of lymphopenia linked to outcome [16]. So, all the findings of this current study may be helpful in the treatment arena of COVID 19 and in further studies.

Limitation of the Study

Though this was a single centered study with small sample size, So, findings of this study may not reflect the exact scenario of the whole country.

Conclusion and Recommendation

In this study, laboratory findings of suspected COVID 19 patients ensured the pre-detection of COVID 19 positive cases. Although RT-PCR test is considered as the gold standard for detecting COVID 19 patients, laboratory findings can play an important role in primary screening of COVID 19 suspected as well as positive cases. Laboratory tests can ensure less hazardous and risky situation among COVID 19 suspected, positive, and negative as well as health professionals. For getting more specific findings we would like to recommend for conducting similar more studies with larger sized samples in several places.

Bibliography

1. Ruan S. "Likelihood of survival of coronavirus disease 2019". *The Lancet Infectious Diseases* 20.6 (2020): 630-631.

2. Saha Priom and Jahida Gulshan. "Systematic Assessment of COVID-19 Pandemic in Bangladesh: Effectiveness of Preparedness in the First Wave". *Frontiers in Public Health* 9 (2021).

3. Yang F., *et al*. "[Pulmonary rehabilitation guidelines in the principle of 4S for patients infected with 2019 novel coronavirus (2019-nCoV)]". *ZhonghuaJie He He Hu Xi Za Zhi* 43.3 (2020): 180-182.

4. Huang C., *et al*. "Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China". *Lancet* 395.10223 (2020): 497-506.

5. Guan WJ., *et al*. "Clinical Characteristics of Coronavirus Disease 2019 in China". *The New England Journal of Medicine* 382.18 (2020): 1708 1720.

6. Pauline V., *et al*. "Clinical features of covid-19, The wide array of symptoms has implications for the testing strategy". *BMJ* 369 (2020): m1470.

7. IEDCR. Covid-19 Status Bangladesh (2020).

8. "Clinical management of severe acute respiratory infection when COVID– 19 is suspected" (2020).

9. Jmaa MB., *et al*. "Epidemiological profile and performance of triage decision-making process of COVID-19 suspected cases in southern Tunisia". *African Journal of Emergency Medicine* 12.1 (2022): 1-6.

10. Xiao AT., et al. "Dynamic profile of RT-PCR findings from 301 COVID-19 patients in Wuhan, China: a descriptive study". *Journal of Clinical Virology* 127 (2020): 104346.

11. Zhu B., *et al*. "Correlation between white blood cell count at admission and mortality in COVID-19 patients: a retrospective study". *BMC Infectious Disease* 21.1 (2021): 574.

12. Wu Z and McGoogan JM. "Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China. Summary of a Report of 72 314 Cases from the Chinese Center for Disease Control and Prevention". *JAMA* 323 (2020): 1239-1242.

13. Soraya GV and Ulhaq ZS. "Crucial laboratory parameters in COVID-19 diagnosis and prognosis: An updated meta-analysis". *Medicina Clínica (Barc)* 155 (2020): 143-151.

14. Zou Z., *et al*. "Prognostic factors for severe acute respiratory syndrome: a clinical analysis of 165 cases". *Clinical Infectious Disease* 38 (2004): 483-489.

15. Al-Samkari H., *et al*. "COVID-19 and coagulation: bleeding and thrombotic manifestations of SARS-CoV-2 infection". *Blood* 1365 (2020): 489-500.

16. Qin C., *et al*. "Dysregulation of immune response in patients with COVID-19 in Wuhan, China. Clinical infectious diseases: an official publication of the Infectious Diseases Society of America 2020". *Clinical Infectious Disease* 715 (2020): 762-768.