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Research Article

**CBC PROFILE AND BIOCHEMICAL ANALYSIS OF COVID-19  
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**Abstract:**

**Introduction:** COVID-19 is basically a RNA virus and the nucleic acid is about 30 kb long, positive in sense, single stranded and polyadenylated. **Objectives:** The main objective of the study is to analyse the CBC value and biochemical analysis of COVID-19 patients. **Material and methods:** This cross sectional study was conducted in Punjab Health Department during January 2021 to June 2021. Outpatients with suspected COVID-19 having initial respiratory signs (including sore throat without shortness of breath), fever, cough, muscle ache, and headache were included. Pharyngeal swab samples were collected for COVID-19 test on presentation. **Results:** Patients with positive RT-PCR had significantly higher NEU count ( $p = 0.0001$ ), and CRP ( $p = 0.04$ ), LDH ( $p = 0.0001$ ), AST ( $p = 0.001$ ), ALT ( $p = 0.0001$ ), and Urea ( $p = 0.001$ ) levels in serum. In addition, patients with positive RT-PCR had lower WBC count ( $p = 0.0001$ ) and serum albumin level ( $p = 0.0001$ ) compared to others. Two hundred cases with the mean age of  $41.3 \pm 14.6$  (range: 19-78) years were studied (0.53% male). **Conclusion:** It is concluded that based on the findings of this study ALT, CRP, NEU, LDH, and Urea have very good accuracy in predicting cases with positive RT-PCR for COVID-19, respectively.

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**INTRODUCTION:**

COVID-19 is basically a RNA virus and the nucleic acid is about 30 kb long, positive in sense, single stranded and polyadenylated. The RNA which is found in this virus is the largest known RNA and codes for a large polyprotein. In addition, coronaviruses are capable of genetic recombination if 2 viruses infect the same cell at the same time [1].

The most common symptoms of COVID-19 is cold, flu, fever and infection in lungs. There are different stages in the attacking of this virus. At stage one and at the start patient just feel flu and temperature just like common cold and flu. But after seven days it becomes more worse and patient feels shortness of breath and dry cough. At advanced stage the patients become also suffered from pneumonia. There is no vaccine and antiviral therapy until now [2].

It was basically starts from China from December 2019, when there was a person who died in Wuhan (a city of China) due to an unknown virus. What started as an epidemic mainly limited to China has now become a truly global pandemic [3]. There have now been over 392,331 confirmed cases and 17,156 deaths, according the John Hopkins University Covid-19 dashboard, which collates information from national and international health authorities. The disease has been detected in more 196 countries and territories, with Italy, the US and Spain experiencing the most widespread outbreaks outside of China. There were 438,441 cases from which 19,650 died and 111,877 were recovered all around the world [4].

The first study on social media during a pandemic dates back to the 2009 H1N1 pandemic, tracking the prevalence of misinformation (determined as 4.5%), terminology use ("H1N1" versus "swine flu"), public sentiments and fear, and relationships between case incidence and public concern [5]. Previous studies used the internet to collect data related to diseases, such as the search frequency of hand washing, hand sanitizer, and antiseptic topics. The WHO declared that they are currently fighting not only an international epidemic but also a social media infodemic, with some media claiming that the coronavirus is the first true social media infodemic because it has accelerated information and

misinformation worldwide and is fueling panic and fear among people [6].

**Objectives**

The main objective of the study is to analyse the CBC value and biochemical analysis of COVID-19 patients.

**MATERIAL AND METHODS:**

This cross sectional study was conducted in Punjab Health Department during January 2021 to June 2021. Outpatients with suspected COVID-19 having initial respiratory signs (including sore throat without shortness of breath), fever, cough, muscle ache, and headache were included. Pharyngeal swab samples were collected for COVID-19 test on presentation. Blood samples were collected from each participant and routine blood test including White blood cell count (WBC), Lymphocyte count (LYM), and Neutrophil count (NEU) were performed on the blood samples. Furthermore, blood biochemistry parameters such as Aspartate aminotransferase (AST), Alanine aminotransferase (ALT), Urea, C-reactive protein (CRP), as well as Albumin and lactate dehydrogenase (LDH) were assessed using HITACHI 7600-020 automated biochemistry analyzer.

Data on Urea, WBC, Albumin, AST, ALT, LDH levels were expressed as mean  $\pm$  standard deviation (SD). Differences in the levels of Urea, CRP, WBC, LYM, NEU, Albumin, AST, ALT and LDH between the RT-PCR positive and negative patients were assessed using student's t-test.

**RESULTS:**

Patients with positive RT-PCR had significantly higher NEU count ( $p = 0.0001$ ), and CRP ( $p = 0.04$ ), LDH ( $p = 0.0001$ ), AST ( $p = 0.001$ ), ALT ( $p = 0.0001$ ), and Urea ( $p = 0.001$ ) levels in serum. In addition, patients with positive RT-PCR had lower WBC count ( $p = 0.0001$ ) and serum albumin level ( $p = 0.0001$ ) compared to others. Two hundred cases with the mean age of  $41.3 \pm 14.6$  (range: 19-78) years were studied (0.53% male). 40.2% of cases were in the 30 to 49 years age range. The result of RT-PCR for COVID-19 was positive in 70 (35%) cases and negative in 130 (65%). Groups of patients with positive and negative RT-PCR were similar regarding gender ( $p = 0.17$ ) and age ( $p = 0.35$ ) distribution.

**Table 01:** Comparing the laboratory parameters of COVID-19 patients

Parameters	Total (n=200)	RT-PCR for COVID-19		P
		Positive (n=70)	Negative (n=130)	
WBC (cell/mm <sup>3</sup> )	5962.8±2127	4043±1002	6894±1982	0.0001
NEU (%)	51.9	60.7	47.8	0.0001
LYM (%)	46.7	37.7	51.8	0.0001
Positive CRP <sup>a</sup> (%)	37	54	27.6	0.04
AST (IU/L)	28.6±8.6	32.1±8.01	26.8±8.3	0.001
ALT (IU/L)	30±9.1	37.8±7.9	26.2±6.9	0.0001
LDH (U/L)	372.5±115	465.2±100.2	327.6±93.2	0.0001
Urea (mg/dl)	28.6±8.01	34.6±8.6	25.8±5.8	0.001
Albumin (g/dl)	3.5±0.9	2.9±0.8	3.7±0.8	0.0001

**DISCUSSION:**

The biochemical markers such as SPO<sub>2</sub>, SGPT and SPOT, mean NLR and platelet count were compared across the Covid-19 only, dengue only, and the control group. Results revealed that mean SPO<sub>2</sub> was significantly lower in Covid-19 and dengue than control, while SGPT and SGOT levels of Covid-19 and dengue patients were significantly higher than the control group [7]. The mean NLR of the Covid-19 and dengue were significantly higher than the control group while thrombocytopenia was observed only in dengue patients. We evaluated the diagnostic and prognostic accuracy of the NLR in COVID-19 patients. Moderate and severe COVID-19 infected patients had significantly higher levels of NLR than mild and non-severely infected patients [8]. The biochemical findings of this study are supported by few of the similar studies done earlier. In the present pandemic era, where there is prime focus on Covid-19 assessment, its intervention and prevention, there are high chances that co-occurrence of dengue might get ignored by the leading healthcare professionals across regional and national boundary. Although, the number of participants in co-infection group was only five, the preliminary empirical analysis of biochemical markers of co-infection group was compared across Covid-19 only, dengue only and control group only [9]. The SPO<sub>2</sub>, SGPT, and SPOT of co-infection group was significantly lower than the control group. These outcomes further motivates to extend further research in this direction as previous onset of more than one epidemic suggests that the comorbidity of Covid-19 and dengue can be more fatal, thus, presenting a greater health challenges which needs to be addressed at the policy level by the healthcare providers [10].

**CONCLUSION:**

It is concluded that based on the findings of this study ALT, CRP, NEU, LDH, and Urea have very good accuracy in predicting cases with positive RT-PCR for COVID-19, respectively.

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