

ROLE OF HEMATOLOGICAL PARAMETERS IN COVID-19 PATIENT IN INDEX MEDICAL COLLEGE, INDORE

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Abstract

AIM: Study to evaluate the pattern of the hematological parameters of covid-19 patients along with their clinical course in the Indian scenario.

Material & method: A prospective study of 100 patients with laboratory-confirmed covid-19 admitted to index medical college Indore from April to June were enrolled for the study. Patients were divided into asymptomatic (mild) patients, and symptomatic (moderate).

The demographic data, the clinical status of the patients during admission, and follow up and hematological findings were recorded. The samples for complete blood count and peripheral smears for microscopy examination were collected on the day of admission. The samples were tested for complete blood count on 5-part hematology analyzer, and values were recorded. Peripheral smears were stained by Giemsa stains, and findings were noted.

Results: All the paediatric cases under study were stable and asymptomatic, with only supportive treatment. Adult patients included in the study were given supportive treatment, and only one case showed clinical deterioration over a period of 90 days of admission.

Conclusion: The study of 100 covid-19 cases of Indian population shows that majority of the patients are younger, have asymptomatic to mild clinical presentation, and a higher incidence in the female population. The majority of pediatric cases have mild symptomatology with a stable clinical course. Baseline CBC findings of all the cases show mild neutrophilia, mild lymphopenia, eosinophilia, mild monocytosis, and a normal to mild thrombocytopenia. A significant statistical trend of increase in CBC parameters, NLR, was noted in follow up cases with persistent symptoms, however, a larger follow up cohort is needed to arrive at a statistical significance.

Keywords: hematological, covid-19 & neutrophilia.

Introduction:

The Virus is spreading around the World, thus assuming the dramatic features of a pandemic emergency. On the 11th March 2020, WHO declared the COVID-19 as a pandemic[1]. India confirmed its first case on 30th January 2020 in Kerala.

The national capital of India, Delhi, and the National Capital Region reported the first case on 5th March 2020, and as of now till Mar 2021, India has 1,85,886 active cases as per data from Ministry of Health and family welfare, government of India website[2].

The clinical characterization of COVID-19 has been broadly by WHO with most of the confirmed COVID-19 cases have mild to moderate clinical presentation. 4.7 to 10.7%[3].

Considering the high infectivity and mortality rates of COVID-19, early diagnosis of the disease is essential. The definitive diagnosis of this disease is made by proving a viral presence in real-time PCR analyses. Due to factors such as the high number of samples, limited number of staff trained in performing the aforementioned tests and insufficient lab capacities, the time it takes to receive results can be prolonged[4]. Therefore, every parameter allowing

for early diagnosis is vital. In this study, the possibility of diagnosing COVID-19 early in ER visits by a simple, inexpensive, easily accessible test, such as a CBC, has been examined[5].

Incidence

0.49 to 0.52, Secondary attack rate estimates ranged from 1.2% (0.0 to 5.1%) in health care setting to 2.6% (1.6 to 3.9%) in the community and 9.0% (7.5 to 10.5%) in the household.

Material & Method

A prospective study of 100 patients with laboratory-confirmed COVID-19 admitted to index medical college Indore from April to June were enrolled for the study. The diagnosis of COVID-19 confirmed by RTPCR performed on respiratory samples of the patients. Patients were divided into asymptomatic (mild) patients, and symptomatic (moderate)

Patients based on the Ministry of health and family welfare government of India Revised guidelines on clinical management of COVID-19.

The demographic data, the clinical status of the patients during admission, and follow up and hematological findings were recorded.

The samples for complete blood count and peripheral smears for microscopy examination were collected on the day of admission.

All patients didn't receive any treatment before blood sampling.

The samples were tested for complete blood count on 5-part hematology analyzer, and values were recorded.

Peripheral smears were stained by Romanowsky stains, and findings were noted.

Data are presented on means and standard deviation. Differences in values between tested confidence intervals were calculated.

Correlation analysis used a simple linear correlation. The optimal cutoff.

Value, sensitivity and specificity of NLR, PLR, and other CBC variables were determined, paired T-test was applied, and follow up data presented separately.

Inclusion criterias

ALL pediatric and adult cases were included in the study.

Exclusion criterias

Patients with chronic lung diseases, hematological disorder, liver diseases, and malignancy on treatment were excluded.

Results

Table 1: Gender Distribution

S. No.	Gender	Percentage
1	Male	67
2	Female	33

Table 2: Severity Distribution

S. No.	Gender	Percentage
1	Mild group	91
2	Moderate/severe group	09

Table 3: Comparisons of hematological parameters according to PCR test results.

Hematological parameters	Negative (n = 43)	Positive (n = 57)
Platelets	231.0 ± 69.3	214.0 ± 74.6
Hemoglobin	14.1 ± 2.1	15.1 ± 3.2
Leukocytes	8.9 ± 3.1	6.2 ± 4.1
Neutrophils	5.9 ± 3.9	3.8 ± 2.4
Lymphocytes	2.7 ± 2.6	2.6 ± 5.1

A total of 100 patients were admitted with a mean age of 37.7 years (03 months), including males & Females. There

were 91 cases in the mild group and 09 cases in the moderate/severe group.

Patients in the moderate group were older than the cases in the mild category. Females constitute 33%, and males constitute 67% of the study population. The median follow up time was of 12 weeks. All the paediatric cases under study were stable and asymptomatic, with only supportive treatment.

Adult patients included in the study were given supportive treatment, and only one case showed clinical deterioration over a period of 90 days of admission.

Discussion

Coronavirus disease 2019 (COVID 19) is a respiratory tract infection caused by a newly emergent Coronavirus, SARS-CoV-2 that was first recognized in Wuhan, China, in December 2019. Genetic sequencing of the virus suggests that SARS-COV-2 is a beta- Coronavirus closely linked to the SARS virus[6]. While most people with COVID-19 develop a mild or uncomplicated illness, approximately 14% develop severe disease requiring hospitalization and Oxygen support, and 5% require admission to an intensive care unit. Several studies have documented SARS- CoV-2 infection in patients who never develop symptoms (asymptomatic) and in patients not yet symptomatic (pre -symptomatic) Since asymptomatic persons are not routinely tested, the prevalence of asymptomatic infection and detection of pre-symptomatic infection is not understood[7].

Clinical and epidemiological data of the asymptomatic and mildly symptomatic cases in Indian lacks to provide an illustration of the epidemiological curve of disease outbreak in the Indian population. Data from our study shows that most of the patients are asymptomatic to mildly symptomatic (92%), thus correlating with other studies in the Chinese and the Western population[8].

Analysis of the baseline CBC parameters of our study population showed that 4 cases (12.9%) showed neutrophilia, 3(9.6%) cases showed lymphopenia, and 5 cases (16.1%) showed monocytosis. However, the baseline total leucocyte count was not increased.

The disparity in the percentage of cases showing lymphopenia may, in part be reflective of the epidemiological variation of the Indian population. The finding of monocytosis in our study has been documented in other studies

Conclusion

The study of (100) COVID-19 Cases of Indian population shows that majority of the patients are younger, have asymptomatic to mild clinical presentation, and a higher incidence in the female population. The majority of pediatric cases have mild symptomology with a stable clinical course. Baseline CBC finding of all the cases show

Mild neutrophilia, mild lymphopenia, eosinophilia, mild monocytosis and a normal to mild thrombocytopenia. A significant statistical trend of increase in CBC parameter,

NLR, was noted in follow up cases with persistent symptoms, however, a larger follow up cohort is needed to arrive at a statistical significance.

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