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EOSINOPHILIA –A COMMON FINDING IN PATIENTS OF COVID-19 AND ITS EFFECT ON CLINICAL OUTCOME

Pathology

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ABSTRACT

BACKGROUND: The SARS-COV-2 is a novel coronavirus which causes COVID-19 disease.This disease has made a huge devastating impact on physical and mental health as well as resulted in plummeting of economy globally. Since its outbreak ,few studies have shown eosinophilia as a finding in Covid-19 patients and its association with better prognosis . We conducted this study with an aim to find out effect of eosinophilia on Covid 19 outcome.

METHODS: This prospective study was conducted in the Department of Pathology, Saraswati Medical College,Unnao,on 200 hospitalised patients of RT-PCR positive Covid-19 patients over a period of 2 months(1st April 2021 to 31st May 2021).We performed slide examination of Peripheral Blood for AEC and other biochemical and radiological investigations for Covid-19 severity.

RESULTS: We found that out of 200 patients ,146 patients required HDU and Isolation ward admission of which those who had mild/moderate eosinophilia(131 patients out of 146) showed 100% recovery while of 15 patients who had eosinopenia or normal AEC ,only 6 recovered and 3 expired even after ICU admission.While out of 54 patients of ICU,the mortality was highest among patients with eosinopenia or normal AEC.

CONCLUSIONS: Our study found that recovery rate was significantly higher and also severity of Covid-19 among patients with mild or moderate or marked eosinophilia was significantly less than those with eosinopenia or normal AEC.

KEYWORDS

Covid-19,Eosinophilia,Peripheral blood smear examination,severity.

BACKGROUND

Eosinophils are circulating leucocytes which have been shown to have immunoregulatory functions as well as antiviral activity [1].Studies have been conducted to see eosinophil responses in Covid patients.This topic assumes significance in the wake of the fact that if eosinophils are found to be protective in Covid -19 by reducing its severity , then we can think of some therapeutic drugs to increase eosinophils in blood and if eosinopenia is protective ,then drugs inducing eosinopenia may be helpful in decreasing morbidity and mortality in Covid-19 patients.Hence , we performed this study to determine eosinophil responses in 200 patients admitted in Saraswati Medical college,Unnao, during a period of 2 months (1st April 2021 to 31st May 2021)

MATERIALS AND METHODS

The present study was conducted on total 200 patients who were RTPCR positive for SARS-Cov-2 and hospitalised (146 patients of HDU and Isolation wards and 54 of ICU) .We collected clinical and radiological data of these patients and performed following laboratory investigations

:CBC,ESR,CRP , Procalcitonin and D-dimer levels.

- We performed CBC of all the patients and also examined the peripheral blood smears of these patients and calculated AEC. The eosinophil percentage and AEC in Covid-19 patients were compared and correlated with severity of disease and the results were summarized.
- We collected morning samples in all the patients to avoid any difference in eosinophil counts due to diurnal variation.

EXCLUSION CRITERIA:

- We excluded all the patients below 18 years and above 60 years(to exclude age related effects on mortality)
- We also excluded all the patients with prior history of Asthma or any allergy which could be already causing eosinophilia.
- We also excluded patients on steroids because steroids cause eosinopenia.

RESULTS

- Out of 200 patients, 146 were admitted in HDU and Isolation ward and 54 patients required ICU admission.Out of 146 patients in HDU and Isolation ward,131 had eosinophilia(Increased Absolute Eosinophil Count) : Of these,115 had mild eosinophili and 16 had moderate eosinophilia .The remaining 15 patients of HDU and Isolation ward had eosinopenia or normal eosinophil count,of these 9 patients required ICU admission later due to worsening of symptoms(6 patients recovered and 3 expired).
- Of the 54 patients admitted in ICU , 13 had mild eosinophilia(11 got discharged and 2 expired),15 had moderate eosinophilia(14 got discharged after recovery and 1 patient expired),16 patients had eosinopenia (7 got discharged and 9 expired),10 patients had normal eosinophil count(6 got discharged and 4 expired).

Table-I(data Of 146 Patients Of HDU And Isolation Ward And Those Requiring ICU Admission Later)

PATIENTS HAVING:	TOTAL	RECOVERED	REQUIRING ICU ADMISSION		
			TOTAL	RECOVERED	EXPIRED
i)Mild eosinophila	115	115			
ii)Moderate eosinophila	16	16			
iii)Marked eosinophila	00	00			
iv)Eosinopenia or normal AEC	15	06	09	06	03

Table-II(Data Of 54 Patients Of ICU)

PATIENTS HAVING:	TOTAL	RECOVERED	EXPIRED
i)Mild eosinophila	13	11	02
ii)Moderate eosinophila	15	14	01
iii)Marked eosinophila	-	-	
iv)Eosinopenia or normal AEC	26	13	13

DISCUSSION

- Till date,only few studies have been conducted with the same aim of finding effect of eosinophil count on Covid-19 outcome.A similar study by Arun Prabhakaran Nair etal found that there was a high prevalence of eosinophilia in Covid-19 patients and such patients had milder symptoms and better prognosis[2].
- Normal Eosinophil percentage is 1-6%(Normal AEC is 0.02-0.5x10^9/L) [3]. They have granules and inflammatory mediators.Once there is infection,eosinophils take part in immune response ,where they undergo degranulation and generate superoxide and nitric oxide which have good antiviral effects [1] .This property may be responsible for their increased number in Covid-19 patients as a protective response to impart resistance against the viral infection to the host cells.
- Our study found that eosinophilia is a common finding in Covid 19 patients and such patients had milder symptoms as well as less increase in biochemical markers like CRP, Procalcitonin ,D-Dimer ,no or very less radiological changes. All such patients required admission to only Isolation wards or HDU and showed faster recovery as compared to patients with eosinopenia or normal AEC who had more severe symptoms as well as higher

mortality also. Most of the patients with eosinophilia showed mild eosinophilia(500- 1500 cells/ cumm) .
- While a study by Marjella Eijmael etal[4] found that eosinopenia is more frequent in Covid-19 patients , contrary to our study.

Although its certain that eosinophils impart great amount of host defence due to their antiviral properties, yet more such studies would be needed to further consolidate this.

CONCLUSIONS

- Our study found that 46% (92)of patients had mild eosinophilia and had no prior history of asthma. 28%(56) patients had normal Eosinophil (AEC) and 26%(52) patients had Eosinopenia.(Total - 200 patients).
- The patients with eosinophilia had very mild radiological changes no or mild rise in CRP and D-Dimer and only mild symptoms of Covid -19.Only 2 patients with eosinophilia required transfer to ICU,one was shifted because he was known case of chronic renal failure and required dialysis and one patient was shifted because of Spo2 level falling < 85%.But both the patients recovered later.
- Amongst the patients who had normal AEC ,10 had mild symptoms and were discharged from isolation ward. Only 3 required ICU transfer, of which 2 expired 4-5 days later and 1 was discharged.

Hence we drew following conclusions from our study:

a) Eosinophilia is a common finding in patients with Covid -19 infection
b) The patients having mild or moderate eosinophilia show mild symptoms as well as mild radiological and biochemical changes and their recovery rates are also higher .
c) Most of the patients with eosinopenia or normal AEC had more severe symptoms as well as more severe radiological changes and more rise in biochemical markers like CRP , Procalcitonin, D-dimer etc. Most of them, therefore, required ICU admission and mortality rates were also higher among them.

ABBREVIATIONS:

HDU = High dependency unit , AEC= Absolute eosinophil count, CBC=Complete blood count ,CRP= C- Reactive protein

REFERENCES

1. Drake MG, Bivins-Smith ER, Proskocil BJ, et al. Human and Mouse Eosinophils Have Antiviral Activity against Parainfluenza Virus. Am J Respir Cell Mol Biol .2016; 55: 387–394.
2. Dacie and Lewis Practical Haematology, 12th edition
3. Arun Prabhakaran Nair etal Clinical Outcome of Eosinophilia in Patients with COVID-19: A Controlled Study Acta Biomed. 2020; 91(4): e2020165. Published online 2020 Nov doi: 10.23750/abm.v91i4.10564 PMCID: PMC7927494
4. Eijmael, M., Janssens, N., le Cessie, S. et al. Coronavirus disease 2019 and peripheral blood eosinophil counts: a retrospective study. Infection 49, 1325–1329 (2021). https://doi.org/10.1007/s15010-021-01710-w.