

Does Leucocyte Count Vary with Beedi Smoking?

Anitha K, Manjunath H

Department of Physiology,
Navodaya Medical College,
Raichur, Karnataka, India

Correspondence to:
Manjunath H
(aaryanmunch@gmail.com)

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ABSTRACT

Background: The peripheral leucocyte count is an important predictor of morbidity and mortality. Hence, host and environmental factors influencing the peripheral leukocyte count are of interest. The influence of smoking on Total Leucocyte Count and Differential Leucocyte Count was investigated.

Aims & Objective: To see the influence of smoking on Total Leucocyte Count (TLC) and Differential Leucocyte Count (DLC).

Materials and Methods: Total Leucocyte Count and Differential Leucocyte Count were estimated in 100 males (50 smokers and 50 non-smokers) by hemocytometry and peripheral smear method respectively. The counts were expressed in Mean \pm SD. Statistical analysis was done by student's t test.

Results: There was statistically significant increase in TLC and in subtypes of leucocytes like eosinophils and lymphocytes in smokers.

Conclusion: Findings of our study may help the motivate efforts to stop smoking.

Key Words: Total Leucocyte Count; Differential Leucocyte Count; Smoking

INTRODUCTION

Cigarette smoking is the leading preventable cause of morbidity and mortality in India. Studies have shown that smokers have higher levels of cholesterol^[1], increased platelet reactivity^[2], and elevated levels of inflammatory markers such as C-reactive protein and fibrinogen^[3,4], when compared to non-smokers. The last two findings suggest the role of smoking in producing inflammation which may be the mechanism leading to cardiovascular diseases like atherosclerosis.^[5] Substantial evidence clearly indicates the immuno-inflammatory nature of atherosclerosis and the important roles of monocytes and other leukocytes in atherogenesis. And leucocytes are one of the essential elements involved in inflammation.

The peripheral leucocyte count is an important predictor of morbidity and mortality. There are many host factors which will influence the peripheral leucocyte count like age, sex, Body Mass Index (BMI), alcohol consumption and smoking. An association between cigarette smoking and increases in WBC counts has been reported.^[4] White blood cell counts were higher in smokers than in nonsmokers, and they declined after 6 months of self-reported tobacco abstinence.^[6]

All these studies have been done in other countries and that too only on cigarette smoking. There are no studies in literature which have been done on other forms of tobacco smoking like beedi (tobacco rolled in a dried leaf without any filter) smoking which is very much prevalent in India. The purpose of this study was to compare total leucocytes and leucocyte subtypes between beedi smokers and non-smokers.

MATERIALS AND METHODS

The study was conducted on 50 beedi smokers who were smoking more than 20 beedies per day for more than five years. Any respiratory and cardiovascular diseases were ruled out clinically. 50 non-smokers were taken as controls. The subjects were clinically examined. The capillary

blood was drawn under complete aseptic precautions; the collected sample was used for TLC by hemocytometry and for DLC by making peripheral smears which were prepared immediately and stained using Leishman's stain following standard protocol. Data were expressed in mean \pm SD. Comparison between two methods was done by Student's 't' test. A 'p' value less than 0.05 were considered as significance.

RESULTS

The TLC in smokers and non-smokers were 11856 ± 2417 and 7312 ± 1122 cell per cubic mm of blood respectively. There was highly significant increase in TLC in smokers with 'p' value <0.0001 . There was statistically significant increase in Eosinophil and Lymphocyte count in smokers compared to non-smokers with 'p' values <0.05 . There was significant decrease in Neutrophil count in smokers compared to non-smokers with 'p' value <0.05 . There was insignificant decrease in Monocyte count in smokers compared to non-smokers.

Table-1: Basic Parameters of Smokers and Non-Smokers

Parameters	Smokers	Non-Smokers	'p' Value
Age in years	34.52 ± 9.56	34.16 ± 9.41	0.850
Body Mass Index (BMI) in kg/m ²	23.98 ± 1.24	23.88 ± 1.20	0.701

Table-2: TLC and DLC in Smokers and Non-Smokers

Parameters	Smokers	Non-Smokers	'p' Value
Total Leucocyte Count (TLC) in cells/mm ³ of blood	11856 ± 2417	7312 ± 1122	<0.0001
Neutrophil Count in %	53.48 ± 6.44	63.32 ± 2.53	<0.05
Eosinophil Count in %	3.64 ± 1.80	2.56 ± 1.34	<0.05
Basophil Count in %	0	0	-
Monocyte Count in %	2.48 ± 1.43	2.88 ± 1.72	0.21
Lymphocyte Count in %	40.28 ± 6.30	31.20 ± 1.73	<0.05

DISCUSSION

Smoking has been well documented to have a positive effect on peripheral total leucocyte count.^[7,8] Our study also confirms such an independent and positive link between smoking and total leucocyte count. Some of the other previous studies showed the same relation between smoking and total leucocyte count and

also demonstrated increase in the all leucocyte subtypes.^[9] But in our study the increase was seen only in eosinophil count and lymphocyte count. The Neutrophil count was significantly reduced in smokers. The reasons for such findings in our study may be due to inclusion of chronic smokers without any acute respiratory symptoms. The suggested explanation for smoking induced increase in TLC and subtypes might be due to nicotine induced release of catecholamines which could raise the leucocyte count. The irritant effect of cigarette smoking on the respiratory tree with resultant inflammation might be a contributing factor.^[10] Cigarette smoking has also been shown to have a number of effects on the immune response of human lymphocytes such as Ig production^[11,12], alteration in the T4/T8 lymphocyte ratio (decreased levels of CD4+ and increased levels of CD8+)^[11,12], reduced NK activity^[13], and depressed mitogen-induced lymphocyte transformation^[14].

CONCLUSION

Results of our study suggests that there is an increase in total leucocyte count and its subtypes like eosinophils and lymphocytes in chronic beedi smokers and these findings can be utilized to motivate them to stop smoking.

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