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Original Article

Blood Haemoglobin Level Comparison Between Smokers And Non-Smokers

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ABSTRACT

Background: Smoking is one of the global problems causing different disease. Smoking cause variation in different parameters of blood among which haemoglobin is believed to be increased due to smoking. Objective: To compare the effect of smoking on hemoglobin levels between smokers and non-smokers. Materials and methods: A crosssectional comparative study was conducted in Department of Pathology, Hematology Laboratory. Total of 40 sample size which compromised of 20 smokers and 20 non-smokers were included the study. Haemoglobin was estimated by Sahli's method. A p-value less than 0.05 was considered statistically significant. Results: The (Mean ± SD) Hb for smokers was 16.32 ± 0.84 g/dl and for non-smokers was 13.64 ± 0.76 g/dl and (p = 0.0001) respectively. Conclusion: The present study showed that the haemoglobin level of smoker group was higher than the non-smoker group. Further substantial studies in large population should be conducted to generalize this findings.

INTRODUCTION

Smoking is a practice in which substance like tobacco is burned and tasted or inhaled. Globally , smoking kills more than four million people every year and likely to cause more premature death by 2020.1,2 The most common method of smoking is industrially manufactured cigarettes but also hand rolled from loose tobacco and rolling paper. Other smoking implements include pipes, cigar, bidis, hookahs, vaporizers and bongs. Toxic ingredients in cigarette smoke circulates throughout the body causing damage in several different ways. The burning tobacco and paper produce more than four thousand chemical compounds in the form of gases, vapours and particulates like carbonmonoxide, hydrogen cyanide, phenols, ammonia, formaldehyde, benzene, pyrene, nitrosamines, nicotine and tar.3 Smoking is known cause of increase in haemoglobin (Hb) concentration, that is believed to be mediated by exposure of carbon monoxide. Carbon monoxide binds to Hb to form carboxyhaemoglobin, an inactive form of haemoglobin having no oxygen carrying capacity. Carboxyhaemoglobin also shift the Hb dissociation curve in the left side, resulting in a reduction in ability of Hb to deliver oxygen to the tissue. To compensate the decreased oxygen delivering capacity, smokers maintain a higher haemoglobin level than non-smokers.4 Tobacco smoking is the most important risk factor associated with chronic bronchitis and emphysema. Parental smoking is said to exacerbate respiratory disease in children. Maternal smoking has been shown to be leading cause of paediatric deaths from low birth weight, short gestation, respiratory distress syndrome and sudden infant death syndrome. Many health problems, hematological and physiological changes are seen in human body due to

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smoking.5, 6 The present study was conducted to compare the effect of cigarette smoking on haemoglobin levels between smokers and age-matched non-smoker controls.

MATERIALS & METHODS

This study was a comparative cross sectional study in which purposive sampling technique was done. A total 40 subjects which were equally divided among smokers and non-smokers and age ranging from 20 yrs to 50yrs. The smokers were regularly consuming 10-20 cigarettes per day for at least 3 years. Blood was collected from each sample and was subjected to Sahli's method.

STATISTICAL ANALYSIS

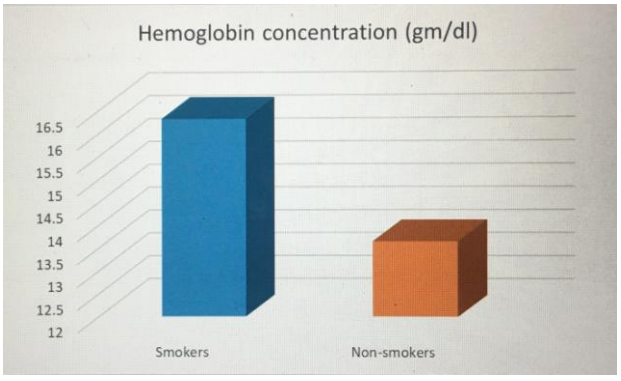
Data were entered in MS Excel 2007 and consequently analysed by using statistical software SPSS (SPSS Inc., Chicago USA). P value less than 0.05 was considered statistically significant at 95% Confidence Intervals.

Results

The study sample comprised of 40 subjects out of which 20 were smokers and 20 were non smokers. The (Mean ± SD) Hb for smokers was 16.32 ± 0.84 g/dl and for non smokers was 13.64 ± 0.76 g/dl and (p = 0.0001) respectively (Table 1).

	Smoking	N	Mean	p-value
Hb	Smokers	20	16.32 ± 0.84	0.0001
	Non-smokers	20	13.64 ± 0.76	

Table 1: Haemoglobin concentration of smokers and non-smokers



DISCUSSION

Smoking is hazardous to health; everyone knows that. However, many people fail to realize the true impact of smoking, which not only affects the smoker's health but the health of others surrounding them. People have very little idea of the types of health related issues smoking can cause not just for those who smoke actively themselves but also for people who take in the smoke passively. So, before you pick up another cigarette, here are things you need to know about the effects of smoking. Smoking is one of the important factors which increases the haemoglobin (Hb) concentration, that is believed to be mediated by exposure of carbon monoxide. Carbon monoxide binds to Hb to form carboxyhemoglobin, an inactive form of haemoglobin having no oxygen carrying capacity. Carboxyhemoglobin also shift the Hb dissociation curve in the left side, resulting in a reduction in ability of Hb to deliver oxygen to the tissue. To compensate the decreased oxygen delivering capacity, smokers maintain a higher haemoglobin level than non-smokers. Studies on reference intervals in hematology published in recent years have often concerned data on important subsets of populations such as the elderly, children or pregnant women, but not on the healthy adult population. In hematology, other challenges are often met, because, with the exception of the concentration of haemoglobin, native samples must be measured fresh, and cannot be reanalyzed after storage. Properly defined reference intervals will result in better interpretation of laboratory results.

Similar result was obtained by Nordenberg D et al, 1990 who confirmed that haemoglobin levels were

significantly higher for smokers than non-smokers. Muhammad A M et al, 2010 remarked, smoking is associated with increase hemoglobin levels in total blood. Ishizaka N et al in their study compared the non- smokers with smokers and found that the haemoglobin level were significantly higher in the smokers. Similarly Tirlapur VG et al, 1983 concluded that haemoglobin concentration increased with advancing age in heavy smokers of both sexes. Aitchison R et al, 1988 showed in his findings that, increased carboxyhemoglobin levels were seen in the samples of study because of smoking. Milman N et al, 1984 found during his study that, tobacco smoking has an increasing effect on haemoglobin concentration in both genders. Our study showed similar results as previous study.

CONCLUSION

The results of the present study confirm that haemoglobin level is significantly higher in smokers than non-smokers. Further large scale studies including different age groups should be required to confirm these findings. Moreover mass campaign should be conducted by government, media and other resources to create awareness, regarding harmful effects of cigarette smoking.

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