e-ISSN 2320 –7876 www.ijfans.org
Vol.12, Iss.1, 2023
 UGC CARE Listed (Group -I) Journal

Estimation Of Serum-Lead Levels In Tobacco Smokers ,Non - Tobacco Smokers, Raw Tobacco Chewers And Its Effects On Hemoglobin Levels-A Comparative Study

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Abstract

Aim & Objective: The aim of the study was to To compare and correlate with Hemoglobin levels in blood in all the groups i.e.., smokers, Raw tobacco chewers, passive smokers, controls.

Methodology: The Methodology followed for preparing this work is mostly the primary and secondary data. The primary data for the study are collected through OPD Department of TRR Medical College during 2021-2022.
Collection method:We have taken MISSION HB [Hemoglobin Testing system] Meter Instrument was used to estimate Hb levels in patient bloodIt contains code chip and has to be inserted into the code chip slot it clicksafter installation and display Hb Test Strip was kept in the slot and with aPricking Finger method free flow blood was collected in a graduated capillary tube and gently blood was transferred on the hb strip and the reading was noticed and documented .

Results: In our study we noticed that there was gradual increase in HB Levels in the smokers, raw tobacco chewers when compared with healthy controls.

Conclusion:
In our study allthe study subjected were compared withhb% levels we noticed increased & showed significant P-VALUE of 0.000 and have showed positive correlation as per annova test and when we have done multiple comparison of hb% levels between different study subject groups by post hoc test –bonferroni method analysis in Smoking vs Raw Tobacco Chewer ; Raw Tobacco Chewer vs Passive Smoking; Passive Smoking vs control – results showed were Not Significant and values are 0.973; 0.163; 0.516 respectively
Whereas Smoking vs. Passive Smoking; Raw Tobacco Chewer vs controls; smokers vs controls were significant Values and P value are 0.002; 0.001; 0.000

Keywords:Smokers,Raw tobacco chewers, Passive smoking ,Pb(lead), Haemoglobin,

INTRODUCTION

The growing use of tobacco is a great concern around the world due to its serious effects on health. The consumption of tobacco products and the number of smokers have been increasing all over the world use of cigarettes is one of the main cause of morbidity and mortality in world[1] and Among tobacco products, cigarette contains 7000 identified chemical compounds which are very harmful, toxic -[2] for human health. Implicated in major diseases.Cigarette smoking is substantial source of intake of several hazardous elements which are Toxic contains several heavy metals such as cadmium, lead, chromium and nickel, manganese ,mercury ,arsenic, bismuth etc.which not only effects Active smokers but also through passive smoking . [3] [4]

Heavy metals have long biological half-lifewhile inhaled through smoking[5] These toxic elements intake for prolonged time leads to accumulation in bone and hard tissue structure like teeth [6]as well as it effects the soft tissue structures of oral cavity and para-oral structures [7] and results in disorder of mineral metabolism and some of which are powerful carcinogens in such toxic metals lead is considered to be harmful in any level. [8]

According to data of WHO in 20th century 100 million people has died from tobacco use and lead plays a significant role in tobacco toxicity [9]

Lead can also enter human organs through food, drinking water and air. lead present in tobacco smoke substantially leads to increased risk of cancer highly toxic metal capable of causing serious effects on brain ,nervous system, rbc s ,decrease in IQ levels and behavioral problems (scientific journal 2012).- [10]

Lead is a redox inactive metal and can generate reactive oxygen species and reduce cell anti oxygen defenses and it also inhibits ferro-chelatase and impairs chain reaction that leads to the formation of heam and results in anemia. [11]

Especially during pregnancy tobacco active smoking increase the concentration of levels of lead in maternal blood results in deposition of lead in bone and increased risk of premature labour and low birth weight of new bones.- [12]

Lead is of particular public health concern because it accumulates in the body particularly bone and teeth [13]

and it is present in several conventional dental materials which are used during treatment procedures etc.., [14]

Few studied in their results showed that higher levels of lead may effect DMFT ,- caries [16]and oral tissues and also It is understood the measurement Hb levels in blood is appropriate method .

So it is very much important for a dentist to avoid lead related products and give awareness to the patient about it and explain the toxicity of this material and its effects in human body including oral soft and hard tissue structures which acts as a marker for general health[17]

In our study we have compared and correlated the association of hemoglobin level in blood between study subjects of all groups.

MATERIALS AND METHODS

This prospective study was conducted in the Department of Dentistry;TRRIMS, Patancheru Study comprised a total of 140 patients out of which 35 were Smokers, 35 passive smokers ,35 raw tobacco chewers,35 were healthy controls. Total 140 sample subjects

Inclusion Criteria

- Low & mid income group
- Non Tobaccoexposed people taken as control
- Those who are frequently exposed to passive smoking example husband or gather in a place of work where smoking in common
- Middle age group

- Gapperiod of 10-15 days of menstruation in female volunteer were taken.

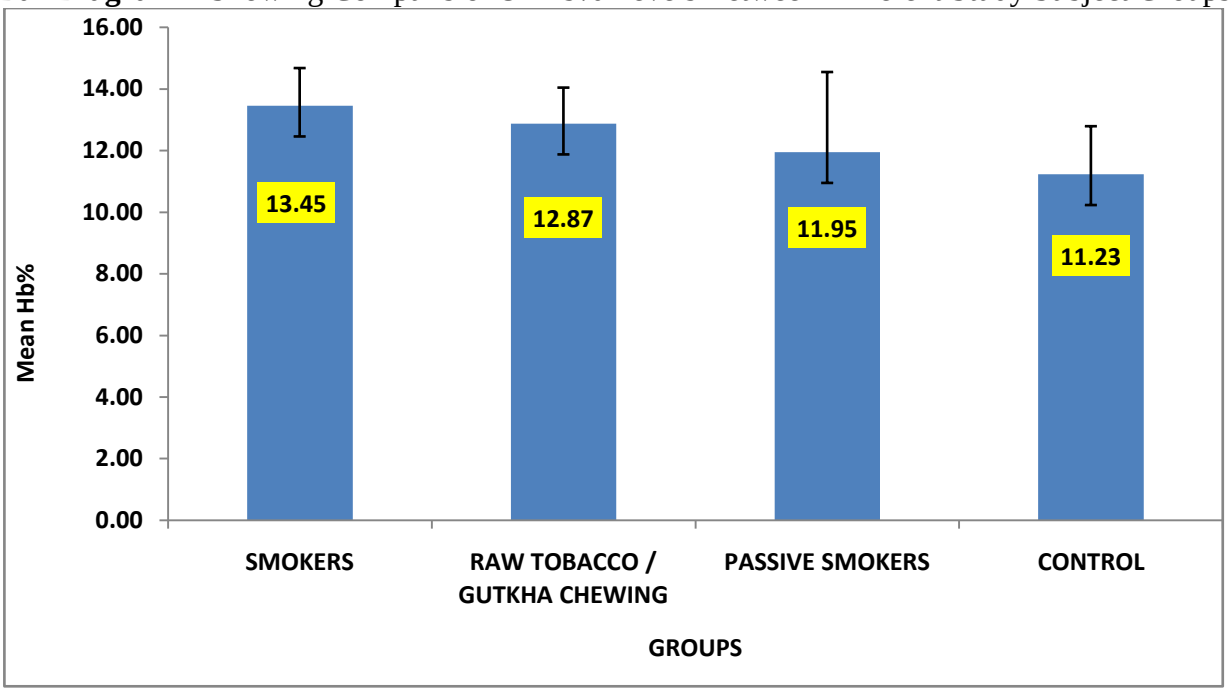
Exclusion Criteria

- Diabetic patient
- H/O other systemic diseases
- Women during & recently menstrated women were excluded

All the participants of the study were explained of the nature of the study, and informed consent was obtained. Detailed case history was noted and 10 millilitres of capillary blood was collected by a needle prick method on a finger in a capillary tube from case group & controls under aseptic conditions using spirit and cotton his method and this method was non invasive.

RESULTS

Bar Diagram 1 Showing ComparisionOf Hb% Levels Between Different Study Subject Groups



The above said table showed gradual increase of rise in hb mean percentage in all the study subjects mentioned in the bar diagram .

Table 1 : Comparision Of Hb% Levels Between Different Study Subject Groups

HB%	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	F Value	P Value
					Lower Bound	Upper Bound				
SMOKERS	35	13.45	1.21929	0.20610	13.0354	13.8731	10.50	15.90	11.280	**0.000**
RAW TOBACCO / GUTKHA CHEWING	35	12.87	1.16759	0.19736	12.4703	13.2725	9.50	14.80		
PASSIVE SMOKERS	35	11.95	2.60015	0.43951	11.0525	12.8389	1.20	16.70		
CONTROL	35	11.23	1.55801	0.26335	10.6934	11.7638	7.90	14.20		
TOTAL	140	12.38	1.91762	0.16207	12.0546	12.6954	1.20	16.70		

Mean and standard deviation of HB% in Smokers group is 13.45 ± 1.219, Mean and standard deviation of HB% in Raw Tobacco / Gutkha Chewing group is 12.87 ± 1.167, Mean and standard deviation of HB% in Passive Smokers group is 11.95 ± 2.60, Mean and standard deviation of HB% in Control group is 11.23 ± 1.558. There is a highly statistical significance of HB% is found between smokers, Raw Tobacco / Gutkha Chewing, Passive Smokersand Controls i.e., P=0.000 < 0.001 using One way ANOVA testSHOWING COMPARISION OF HB% LEVELS BETWEEN DIFFERENT STUDY SUBJECT GROUPS

Multiple Comparisons

Bonferroni : Dependent Variable: HB%

(I) GROUP	(J) GROUP	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
SMOKERS	RAW TOBACCO / GUTKHA CHEWING	.58286	.41470	.973	-.5275	1.6932
	PASSIVE SMOKERS	1.50857*	.41470	**.002**	.3983	2.6189
	CONTROL	2.22571*	.41470	**.000**	1.1154	3.3360
RAW TOBACCO / GUTKHA CHEWING	SMOKERS	-.58286	.41470	.973	-1.6932	.5275
	PASSIVE SMOKERS	.92571	.41470	.163	-.1846	2.0360
	CONTROL	1.64286*	.41470	**.001**	.5325	2.7532
PASSIVE SMOKERS	SMOKERS	-1.50857*	.41470	**.002**	-2.6189	-.3983
	RAW TOBACCO / GUTKHA CHEWING	-.92571	.41470	.163	-2.0360	.1846
	CONTROL	.71714	.41470	.516	-.3932	1.8275
CONTROL	SMOKERS	-2.22571*	.41470	**.000**	-3.3360	-1.1154
	RAW TOBACCO / GUTKHA CHEWING	-1.64286*	.41470	**.001**	-2.7532	-.5325
	PASSIVE SMOKERS	-.71714	.41470	.516	-1.8275	.3932

*. The mean difference is significant at the 0.05 level.

Multiple comparison test i.e., Bonferroni test is used for the comparison of HB% between all the groups individually. It is found that there is no statistical significance of HB% is found between smokers with Raw Tobacco /Gutkha Chewing (i.e., P=0.973 > 0.05).It is found that there is a statistical significance of HB% is found between Smokers with Passive Smokers and Smokers with Control (i.e., P=0.002 < 0.05 and P=0.000<0.001).It is found that there is no statistical significance of HB% is found between Raw Tobacco /Gutkha Chewing with Passive Smokers (i.e., P=0.163 > 0.05). and It is found that there is a statistical significance of HB% is found between Raw Tobacco /Gutkha Chewingwith Control (i.e., P=0.001 < 0.05).It is found that there is no statistical significance of HB% is found between Passive Smokers with Control (i.e., P=0.516 > 0.05).

DISCUSSION

Cigarette smoking and tobacco chewingon across the global and major cause of concern which is preventable morbidity and motility as per funck –brentanoetal–[18]stated that lead is an essential that plays an integral role in many of our physiological processof the body but however it is highly toxic poisonous- metal that has known to trigger biological functions affecting almost every organ and system of the body .- [8]

Various authors has suggested in there studies about hb levels and there correlation in on such study made by lakshmi and etal [19] in there study noticed a gradual increase of hb levels in the smokers this kind of results we noticed in our research study and also concurrent with White head and etal[20]study , in there study they observed that HB and HCT values were elevated in smokers which was increased significantly those who were smoking more than 10 cigerattes per day.

Another done by Schwartz and Weiss there is increase in number of blood cell especially netrophils-[21] As per Anandha Lakshmi [22]suggested from their results of their study the mean total WBC count of smokers was significantly higher ($p<0.05$) than non smokers and WBC count increases with intensity of smoking as shown . This finding is consistent with zalokar JB et al [23]
As per Ingrid Elisia in their findingfound that smoking increase the size and haemoglobin level of rbcs is consistent with the literature. [24]]The basic and important part of our study about HB level all study subjectedi..e..,comparision of hb% levels between different study subject groups are highly increased & showed significant P-VALUE have showed 0.000 positive correlation as per annova test .
As our study per as per multiple comparisonof hb% levels comparison between different study subject groups by post hoc test–bonferroni method analysis inSmoking vs Raw Tobacco Chewer ; Raw Tobacco Chewer vs Passive Smoking; Passive Smoking vs control – results showed were Not Significant and values were 0.973; 0.163 ;0.516 respectively ,Where as Smoking vs Passive Smoking ; Raw Tobacco Chewer vs controls ; smoker vs controls were significant and p value showed was .002; 0.001; 0.000 respectively these finding results are similar to that of laxmi and etal and other authors mentioned above further more we have take few more parameter like HCT,ORALHEALTH and other parameters.

CONCLUSION

The mean Hb levels has gradually elevated in smoker, and raw tobacco when compared with controls,and passive smoking which was slight higher. The mean hb levels increased with disease progression for smoker, and raw tobacco chewers, with slight higher value in males.However, further longitudinal studies are to be carried out to confirm an association between HB levels in the blood and further we could establish connection between oral aspects to hb levels of study subjects also furthermore many parameters have to be included for better approach for diagnosis and treatment.

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