International Journal of Academic Health and Medical Research (IJAHMR(
ISSN: 2643-9824
Vol. 5 Issue 1, January - 2021, Pages: 9-12

Effects of Hookah (Water Pipe) Smoking on Platelets Count and Platelets Parameters in Khartoum State-Sudan

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Abstract: *Background: This study aimed to investigate the effect of Hookah smoking on platelets count and platelet indices. Hookah smoking is becoming highly prevalent and is a predominant mode of tobacco use particularly among the young people; Hookah smoking carries high risk for human life lead to dangerous disease like formation of thrombi which eventually can cause heart and arteries disease. Materials and Methods: Fifty Hookah smokers and 50 non-Hookah smokers were enrolled in this study in Khartoum state â€“Sudan. Blood samples were taken, and analyzed for platelets count and indices using Convergys® X3 automated hematology analyzer. Data obtained were analyzed using student t test, Pearson correlation and chi square test. Results: Hookah smokers were found to be younger than non- Hookah smokers p< 0.05(0.00), platelets count and PCT were significantly increased among Hookah smokers p<0.05 (0.005 and 0.000) respectively, there was insignificant difference in the mean of PDWs p >0.05 (0.33)and MPV p >0.05 (0.32) between Hookah and non-Hookah smokers. There was a significant correlation between platelets count and duration of Hookah smoking p<0.05 (0.006), also there was a significant association between Hookah smoking and wound healing p<0.05(0.006) Conclusions: There was a significant increase in the platelets count and PCT among Hookah smokers than non-Hookah smokers.*

Keyword: Hookah, Platelets parameters, Platelets count

1. Introduction

Tobacoo smoking using water pipe also known as Hookah, Shisha, or Narghile, has been smoked in different parts of word for more than 400 years [(1)].

Hookah is a fashionable practice that considered as smoking type commonly used in the Middle East and now rapidly spreading in Europe and North American and widely common among young people [(2).]

Hookah, composed of mixture of tobacco 30% and 70% is a mixture of flavorings, glycerol and sweeteners [(3)].Hookah smoker may inhales more smoke in one Hookah session than cigarette smoker which equal to twice amount of nicotine in cigarette, more over using same pipes can increase the risk of transitional disease [(4-6)].

World health origination (WHO) global report on prevalence of tobacco stated that smoking in any form killed and sickens millions of people, worldwide around 8 million died due to tobacco related disease in 2017, One of these related disease is thrombus formation which can lead to cardiovascular disease[(4,7)].

Hookah as smoking habits have a persistent effect on blood hematology, this may lead to change in different cellular components of blood like platelets number, indices which have been altered among smokers[(8)].

Many studies reported the association between Hookah smoking and alteration in platelets number and indices which can lead to thrombosis [(8, 9)].

This study aimed to detect the effect of smoking Hookah on platelets count and indices.

2. Materials and Methods:

This study used a cross sectional design, conducted in Khartoum state (Hookah cafe) –Sudan. Blood samples were collected in Ethylene Diamine Tetra Acetic Acid (EDTA) from 50 Hookah smokers and 50 non-smokers after informed consent from all patients prior to data collection, investigation was conducted in accordance with the Declaration of Helsinki. A questionnaire was designed to obtain demographic data, duration of Hookah smoking and wound healing. Blood samples were analyzed by *Convergys® X3* automated hematology analyzer for platelets counts, mean platelets volume, platelets hematocrit and platelets distribution widths (MPV,PCT and PDWs). The data obtained were analysed using Statistical Package for the Social Sciences (SPSS) 23, Student's *t*-test was used for quantitative variables, p value less than 0.05 was considered statistically significant, *pearson* correlation was used to determine the correlation between platelets count and duration of Hookah smoking, *chi* square was used for qualitative data (population under study and wound healing).

3. Results:

Among Hookah smokers there was 40 males and 10 females, while among non-Hookah smokers there was 37males and 13 females **Fig. 1.**

There was a significant difference in the age between Hookah smokers and non-smokers 24± 6.1SD and 30 ± 6.1SD year respectively p < 0.05 (0.00).**Table.1**

The mean of platelets was 281±69.1 × 10^9c/l among Hookah smokers and 232± 99.5 × 10^9 c/l among non-Hookah smokers with significant p <0.05 (0.005), moreover the mean of PCT among Hookah smokers was 0.31±0.09 % and 0.24±0.11 % among non-Hookah smokers p < 0.05 (0.00), in contrast there was insignificant difference in the mean of MPV and PDWs between the two groups with p>0.05 (0.32 and 0.33) respectively **Table.1.**

Seven (14%) of Hookah smokers showed delayed in wound healing while all non-Hookah smokers showed normal wound healing, *Chi* square revealed that there was a significant association between wound healing and Hookah smoking p<0.05 (0.006).**Table.2**

Hookah smokers showed duration of smoking 8.1± 3.2 years, *Pearson* correlation revealed a significant correlation between platelets count and duration of Hookah smoking p < 0.05(0.006) with correlation coefficient 0.41as in **Table.3**

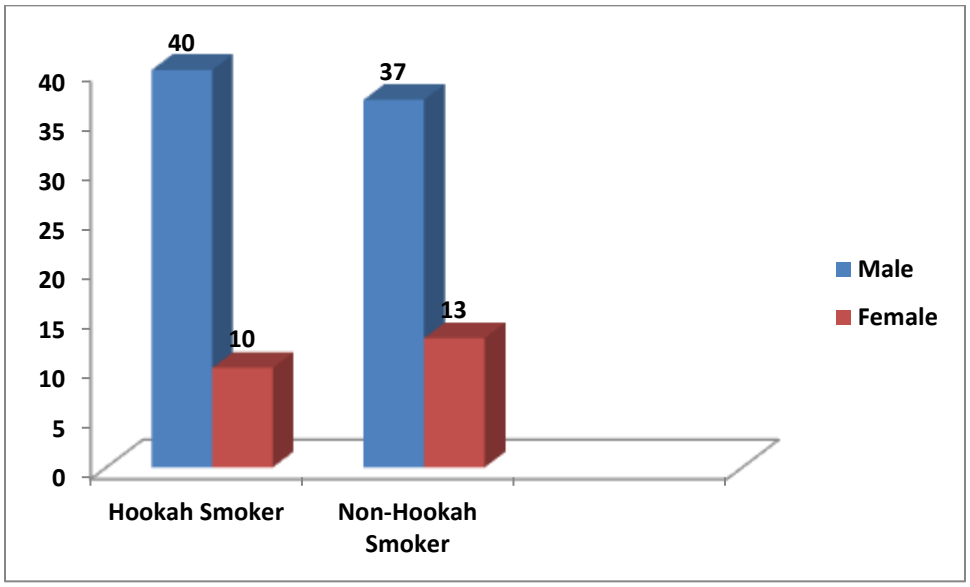

Figure 1: Gender Distribution

Table.1 Mean of Age, Platelets, MPV, PDWs and PCT:-

Variables		Mean ±STD	P. Value
Age	Hookah Smokers	24 ± 6.1	0.00
	Non- Hookah Smokers	30 ±6.1	
Platelets (× 10^9/L)	Hookah Smokers	281±69.1	0.005
	Non- Hookah Smokers	232±99.5	
MPV(FL)	Hookah Smokers	10.6±0.86	0.32
	Non- Hookah Smokers	10.80±1.10	
PDWs (FL)	Hookah Smokers	14.4±2.01	0.33
	Non- Hookah Smokers	15.03±3.38	

(PCT %)	Hookah Smokers	0.31±0.09	0.00
	Non- Hookah Smokers	0.24±0.11	

Table.2 Association between Wound Healing and Hookah Smoking:

	Wound Healing		P.Value
Population	Normal Healing	Delay Healing	
Hookah Smokers	43(86.0%)	7(14.0%)	
Non- Hookah Smokers	50(100.0%)	0(0.0%)	0.006
Total	93(93%)	7(7%)	

Table.3 Correlation between Platelets Count and Duration of Hookah Smoking

Variables	Mean ± SD	P.Value	Correlation
Platelets Count in Hookah Smokers	281±69.1 × 10^9c/l	0.006	0.41

4. Discussion:

Hookah tobacco smoking, has increased incredibly, and become a global epidemic of tobacco related morbidity and mortality, moreover it become an addiction habits in different societies [10, 11].

This study was conducted to determine the effect of Hookah smoking on platelets count and indices. The study was conducted in Khartoum state-Sudan, in this study Hookah smokers was younger than non-smoker p <0.05 (0.00), this was consistent with (Nicksic et al.,2018), they enrolled their study among young adults Hookah smokers their age were 24.3± 2.9 SD years [12].

Salih SI., 2015 found platelets count was increased among Hookah smoker [13]. This was similar to finding of this study in which the platelets was significantly higher among Hookah smokers, in contrast other studies found insignificant difference in platelets count [3, 8, 14, 15].In addition to that, in this study the PCT was higher among Hookah smokers p <0.05(0.00), however (Osamah et al., 2016) found PCT was slightly higher among Hookah smokers but with insignificant level p> 0.05 (0.194) [16]. The MPV and PDWs were found to be insignificantly different in Hookah and non -Hookah smokers p > 0.05 (0.32 and 0.33) respectively, this was agreed with results obtained by (osamah et al., 2016 and Mohammed H., 2010) [16, 17]. In contrast (Okafor and Okoroiwu., 2017) found significant difference in the MPV and PDWs which indicate active platelets [15].

This study showed that a positive significant correlation between platelets counts and duration of Hookah smoking, however osamah et al., 2016 found a negative correlation [16].

In vivo oxidative stress increased significantly with Hookah smoking [1]. This oxidative stress have a deleterious effect and may alter platelets functions. Increase in oxidative stress was reported as an important factor in non-healed wound [18-20]. In this study Hookah smokers developed delayed wound healing compared to non- Hookah smokers.

5. Conclusion:

Water pipe (Hookah) smoking increase platelets count and PCT compared to non-Hookah smokers.

Conflicts of Interest

The authors declare that they have no competing interests.

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