# Study the Impact of Some Factors Associated with Hookah Smoking on Blood Standards

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#### ABSTRACT

This study was conducted on the students of the Department of Life Sciences / Faculty of Pure Sciences / University of Diyala for the period from 15 January 2019 to 15/3/2019 and received study samples of intravenous blood for students who smoked for hookah only and did not smoke for sugar, and through questioning that they do not suffer from any known genetic diseases (such as diabetes, hypertension, heart disease, etc.). Only 35 male blood samples were obtained, and a special information form was prepared, including (age, number of smoking times per day, time spent smoking, PCV ratio, Hb ratio, RBC number, WBC number). The results of the current study showed the absence of moral differences in the numbers of red blood cell, white blood cell numbers, hemoglobin concentration and the ratio of Packed Cells Volume when compared to the age groups of smokers. The results showed that there were moral differences in the numbers of red blood cells in the totals of the number of smoking times compared to some of them. The results also showed that there were moral differences in the numbers of white blood cells, the concentration of total hemoglobin and the Packed Cells Volume in the totals of the time spent smoking compared to some of them.

#### **INTRODUCTION**

Smoking is one of the major pests that cause sedation even after a while, as the World Health Organization (WHO) noted in a report that nearly four million people die every year as a result of smoking, and may reach more than (10) million people a year 2030 (Murray and Lopes 2000). Globally, the annual tobacco mortality rate is estimated at 4.9 million, and this number could rise to 8 million in the next 20-30 years. In Iraq, there has been a marked increase, particularly over the past few years in tobacco use (including hookah) among young people (WHO 2014). Smoking hookah has the same effects as exposure to cigarette smoke, many people believe that the water that passes through the smoke purifies it and reduces the negative effects of shisha and therefore is less dangerous than cigarettes, but this is not true, the risk of hookah is equal to the risk of cigarettes (Cobb et al 2013). The healthy effect of hookah depends on the length of the smoking cycle which may range from 20-80 minutes and may be prolonged, the number of suction times per cycle and the depth of suction where the number of suction times ranges from 50-200 suctions per session to half a liter of air (Sutfin et al 2014).

Many studies have confirmed that as long as nicotine enters the hookah tobacco there will be addiction by smokers and it turns out that some smokers suffer a lot in order to give up smoking hookah and as it was noted that a change in their behavior until reference to it. This is really because tobacco contains nicotine, which is a highly addictive substance. This change in 613ehavior is caused by the material's access to the brain and physiological changes in it resulting in a constant and frequent need for matter (Eissenberg and Shihadeh 2009).

When smoking hookah it causes high nicotine content in the blood which leads to increased blood pressure and heart rate as cigarettes do as well as increase the ratio of cotinine in platelets or plasma, the ratio of cotinine in saliva increases, which affects the saliva glands and Keywords: Smoking, hookah, hemoglobin, white blood cells.

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makes them secreted in a lower amount and this affects the health of the mouth and gums, as the inhalers lead to chemical reactions affecting the nerve endings, allowing the release of dopamine, which is associated with the feeling of pleasure, and this seems to play an important role In nicotine addiction. There are many diseases associated with hookah smoke such as lung and esophagus cancer and cardiovascular diseases as well as risks to the expectant mother as well as transitional diseases such as viral hepatitis, tuberculosis and pharyngeal infections (Eissenberg and Shihadeh 2009). The amount of smoke inhaled during a single hookah session exceeds the smoking of about 200 cigarettes. There are large amounts of Nicotine plus an estimated 0.34-0.4 percent. Of the first toxic carbon oxide (CO). In addition, tobacco smoking in general contains more than 4,800 chemicals, including at least 69 Carcinogenic substances (Sutfin et al 2014).

#### **MATERIAL AND METHODS**

#### Patients

Intravenous blood samples were obtained from students of the Department of Life Sciences/ Faculty of Education of Pure Sciences / Diyala University from smokers of hookah only and non-smokers of sugar, and through questioning that they do not suffer from any known genetic diseases (such as diabetes, hypertension, heart disease, etc.). Only 35 male blood samples were obtained, with intravenous blood placed directly in 2.5 cm3 tubes containing Ethylene Diamine Tetra Acetic Acid. Used directly without storage to analyze blood standards including Hemoglobin, Packed Cells Volume (PCV), Red Blood Cells (RBC) calculation, and White Blood Cells (WBC) calculation. A special information form was also prepared, including (age, number of smoking times per day, time spent smoking, PCV ratio, Hb ratio, RBC number, WBC number) according to the form described Table

NO.	Age	number of smoking times per day	time spent smoking	PCV ratio	Hb ratio	RBC number	WBC number
1	18	1	2	46	15.3	5.2	8
2	20	2	2	50	16.6	7	8.3
3	24	3	1	48	16	5.7	7.9

Table 1. Some samples from the information form.

Where the group of hookah smokers by age was divided into two groups:

Group 1 (10-20 year) Number = 17

Group 2 (21-30 year) Number = 18

They were also divided by the number of smoking times into three groups:

Group 1 (once a day) Number = 17

Group 2 (twice a day )Number = 15

Group 3 (three times a day) Number = 3

They were also divided according to the time spent smoking at a time of three groups:

Group 1 (half hour) number = 11

Group 2 (One hour) number = 12

Group 3 (Two hours) number = 12

#### Methods

Blood samples were withdrawn from the intravenous blood (for smokers) using sterile medical syringes, placing intravenous blood directly in tubes with a capacity of 2.5 cm3 containing anticoagulants (EDTA) and then placed in lattain tubes and then placed in the centrifuge at a speed of 12000 cycles / minutes for the purpose of separating blood and extracting PCV ratio by means of the device (reader Hematocrit) after which the number of red blood cells RBC and the number of white blood cells was calculated by the New Power and WBC microscope.

#### **Blood Measurements**

Blood samples were withdrawn during slaughter in container test tubes on (EDTA) to measure the volume of Packed Cells Volume and hemoglobin concentration and the total number of red and white blood cells.

#### Packed Cells Volume and Hemoglobin

Measured the percentage of the size of blood cells stacked by placing open-ended glass lattice tubes that do not contain a blood clotting inhibitor obliquely (45°C) and after three-quarters of the tube is filled with the filling of the blood-soaked ends with artificial clay, and then placed in the centrifuge Micro-Hematocrit centrifuge for five minutes at a speed of 12000 rpm, the length of the hematocrit reader is read in the capillary, representing the length of the deposit representing the percentage of the Packed Cells Volume and then the Hb ratio is calculated by equation (HB=PCV/3) (Hughes *et al* 2004). **Red Blood Cells Calculation** 

The red blood cell numbers were calculated using the Hemocytometer counting chip, by drawing blood by means of its own pipette to the limit of the mark 0.5 and the volume to the mark 101 is supplemented by hyme's solution, after mixing the contents of the pipette by hand shaking for ten seconds, the count slide was prepared after the first three drops of blood and the use of the fourth slide by placing it on the edge of the slide connection with its cover, leaving a period of two minutes for the stability and stability of the cells and then examined with a microscope (zoom photo power 40X) By calculating the number of cells in five medium squares each average square contains 16 small squares (Hughes *et al* 2004). The total number of red blood cells is extracted as in the following equation:

Red blood cell number /  $Mm^3$  blood = (the number of cells in five medium squares) x 200 (inverted dilution ratio) x 50 (inverted distance between the slide and its cover ).

## White Blood Cells Calculation

calculated the white blood cells using the I hemocytometer counting chip by drawing blood by means of their own pipette to the extent of the mark 0.5 and then completes the volume to the mark 11 with turk's solution, and after mixing the contents by hand shaking for ten seconds and then leave the sample for three minutes to get rid of red blood cells, and to prepare the count slice was disposed of the first three drops and used the fourth by placing it on the edge of the slide connection with its cover, and left for two minutes for the purpose of the cells stability of the cells Its stability was then examined by optical microscope (magnification force 40X) by calculating the numbers of cells within the large box (Hean1995). The total number of white blood cells is extracted as in the following equation:

White blood cells number /  $Mm^3$  blood = number of cells in four large squares x 20 (inverted dilution coefficient) x 10 inverted distance between the slide and its cover.

Table 2. show natural values of the blood standards of males (Al-Shaaer at el 2007)

Blood Standards	Normal Values for Male
Hemoglobin (g / dl)	13 - 17
Red Blood Cells (10 <sup>6</sup> /m m <sup>3</sup> )	4.5 - 5.5
Packed Cells Volume (%)	42 - 52
White Blood Cells (103/m m <sup>3</sup> )	4 - 11

#### **Statistical Analysis**

Statistical analysis was carried out using C.R.D. for the factorial experiment with two factors, while the moral test of the differences between transactions was used duncan's multiple range test (Duncan1955) I have used the Ready Statistical Analysis Program, (S.A.S 2009) to analyze the data.

#### **RESULTS AND DISCUSSION**

Smoking of all kinds is one of the biggest scourges affecting society and has been described by the U.S. Centers for Health Control and Prevention as the single, preventable and most important risk to human health in developed countries and one of the leading causes of premature death worldwide. (WHO 2005)

In a study conducted by researchers at the American University of Beirut (Atmos Environ 2010). Smoking a single cycle of hookah releases an average of four times the carcinogen, and four times the pilot's dihyde and thirty times the carbon monoxide released by a single cigarette. The study also showed that smoking an entire hour of hookah releases in the surrounding atmosphere carcinogenic and toxic substances that are released by 10-20 cigarettes. In other cases, the effect of secondhand smoke from hookah smoking may be greater than cigarette smoking (Gupta at el 2001).

Effect of the age of hookah smokers in both the total number of white and red blood cell, total hemoglobin and Packed Cells Volume: The results in Table (3) indicated a lack of moral differences in the numbers of erythrocytes in egg blood cell count, hemoglobin concentration and the ratio of blood cosmetology when comparing the age groups of smokers. Effect of the number of smoking times per day in both the total number of white and red blood cell, total hemoglobin and Packed Cells Volume:

The results in table (4) show the absence of moral differences in the numbers of white blood cells and the

concentration of hemoglobin and the ratio of blood thinning when comparing the totals of smoking times. Effect of the time spent smoking at a time in both the total number of white and red blood cell, total hemoglobin and Packed Cells Volume:

In the same table (5) we note a moral increase in the numbers of red blood cell, but exist moral increase in the numbers of white blood cells, concentration of hemoglobin and Packed Cells Volume ratio when comparing the totals of time spent smoking. The results of the current study in table (5) indicated a moral increase in the numbers of white blood cells in the blood of hookah smokers and may be attributed to this tobacco smoking is one of the important factors in the events of allergies and infections in the airways, lungs, kidneys, heart axon, liver, skin, soft or disjointed tissues, where these infections stimulate stem cells in the bone marrow to increase the percentage of the manufacture of egg blood cells and increase this percentage by increasing the number of smoking times per day and increasing the duration of smoking. These results are similar with the results of (Moszczynki at el 2001; Brent 2000).

The results in table (4) and (5) also showed a rise in the number of red blood cells and the concentration of total hemoglobin and blood suppressors in the group of smokers compared to some of them, and this can be attributed to the fact that smoking leads to a decrease in the volume of plasma in the blood and may be due to increased mass Red blood cells are the result of poor oxygen supply of blood tissue, i.e. less hemoglobin with oxygen (HB-O) and increased class in association with carbon monoxide and thus increased the complete hemoglobin (HB-CO) causing blood poisoning and increased for his wife and this height The number of smoking times per day increases and the time spent smoking at a time at a time is consistent with the results (El-nachef Hammond and 2008).

Variables			White Blood Cells	Red Blood Cells	Packed Cells	Hemoglobin
	Observations	Percentage	(103/m m <sup>3</sup> )	(106/m m <sup>3</sup> )	Volume (%)	(g / dl)
Groups						
10-20 Year	17	% 49	0.60 ± 8.31	0.6 8 ± 6.49	1.32 ± 43.94	0.44 ± 14.61
			а	а	а	а
21-30 Year	18	% 51	0.74 ± 6.73	0.98 ± 7.97	1.54 ± 42.72	0.52 ± 14.18
			а	а	а	а

## Table 3. Effect of the age of smokers in blood standards.

The different letters in one column indicate a moral difference.

Table 4. Effect of the	number of smoking	times on blood standards.

Variables Groups	Observations	Percentage	White Blood Cells (103/m m <sup>3</sup> )	Red Blood Cells (106/m m <sup>3</sup> )	Packed Cells Volume (%)	Hemoglobin (g / dl)
Once a day	17	% 49	0.56 ± 6.41 a	1.03 ± 7.72 ab	1.52 ± 42.17 a	0.51 ± 14.01 a
Twice a day	15	% 43	0.75 ± 8.57 a	0.47 ± 6.04 b	1.17 ± 45.13 a	0.39 ± 14.99 a
Three times a day	3	% 8	2.77 ± 8.26 a	2.65 ± 10.66 a	2.92 ± 40.66 a	1.98 ± 13.50 a

The different letters in one column indicate a moral difference.

Variables Groups	Observations	Percentage	White Blood Cells (103/m m <sup>3</sup> )	Red Blood Cells (106/m m <sup>3</sup> )	Packed Cells Volume (%)	Hemoglobin (g / dl)
Half hour	11	% 32	0.42 ± 5.36 b	0.83 ± 6.53 a	1.81 ± 39.09 b	0.60 ± 12.95 b
One hour	12	% 34	0.57 ± 8.85 a	0.90 ± 7.16 a	1.01 ± 45.58 a	0.33 ± 15.15 a
Tow hour	12	% 34	1.06 ± 8.10 a	1.36 ± 8.00 a	1.81 ± 44.91 a	0.60 ± 14.94 a

**Table 5.** Effect of the time spent smoking for blood standards.

The different letters in one column indicate a moral difference.

#### CONCLUSION

We conclude from the results that hookah smoking affects both hemoglobin, Packed Cells Volume and the number of red and white blood cells.We also conclude that increased smoking times and increased smoking time have an impact on blood standards as a result of the accumulation of nicotine in the blood leading to addiction.

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