Global Scientific Journal of Biology 8 (1) 2023/ 99-108

Contents lists available at www.gsjpublications.com

Global Scientific Journal of Biology
Part A: Microbiology and Biotechnology
ISSN: 2524-227X
journal homepage: www.gsjpublications.com/gsjb

Studying the Effect of Excessive Smoking on Tissue Blood Viscosity and the Detection of Bacteria that Cause Respiratory Diseases

Ali F. Hussein[1], Nada J. Dawood[2], Rakeshkumar R. Panchal[2], Dweipayan Goswami[2]

[1]Department of Nursing Technical, Technical institute of Basra, Iraq.
[2]Department of Microbiology and Biotechnology, School of Sciences, Gujarat University, Ahmedabad, Gujarat, India.

ARTICLE INFO

Received: 7 May 2023,
Revised: 9 May 2023,
Accepted: 19 May 2023,
Online: 19 Jun 2023

Keywords:
Blood, smoking, microbes, viscosity, human, bacteria

ABSTRACT

This study aimed to diagnose the most important factors and the effect of smoking on the incidence of blood viscosity and associated diseases and its impact on gums due to microbes. The study started on 1/1/2021 and ended on 5/30/2022. The study was conducted on 160 samples ranging in age from 18-72 years. The use of cigarettes significantly affects the rise in blood viscosity, which is important for adults and young adults. In addition to an increase in blood viscosity, it was discovered through a laboratory examination of 60 samples between the ages of (18-72) years, and we obtained the results when compared to the normal ratios as shown tables (2&3) . Through our research, we examined 100 samples isolates from the respiratory tract of active smokers, passive smokers, and nonsmokers their age (18–25 years) of and get six microorgainsml species were isolated: Bacillus, Candida, Corynebacterium, Klebsiella, Diplococcic, and Staphylococcus spp table (1).Smokers' blood pressure is higher than nonsmokers'. In addition to increasing blood viscosity, we found through a questionnaire for smokers that they had suffered from the following symptoms: Lack of balance, fainting or feeling dizzy, and general fatigue are the most common signs of smoking, along with laziness, lethargy, a sense of pain, and headaches. Other symptoms include blurred vision, red skin, itching, and tickling in different body parts.

1. Introduction

Although smoking is usually very bad and dangerous, it is still sold worldwide; even companies that manufacture cigarettes write on the cane Smoking is harmful to health and causes death. Scientists have identified over 5,300 different chemicals in tobacco smoke. More than 70 chemicals in tobacco smoke have been found to cause cancer. Smoking is considered one of the main risk factors for hypertension. Smoking high or low nicotine cigarettes are particularly responsible for increased systolic blood pressure, heart rate, and myocardial oxygen demand. In the USA, 90% of deaths are caused by smoking, and lung disease is ten times more acute in smokers than in nonsmokers. Some kinds of microorgainsml culture are isolated from cigarettes, and these microorgainsm are considered the main source of respiratory toxins. Smoking causes unattractive problems such as bad breath and stained teeth and damages your

Corresponding author:
E-mail addresses: Jaferhamed83@yahoo.com (Jafer), a.faisal@stu.edu.iq (Ali) Orcid ID 0000-0002-4104-593X, n.alkamil@stu.edu.iq (Nada), rrpanchal@gujaratuniversity.ac.in (Rakeshkumar), dweipayan.goswami@gmail.com (Dweipayan).
doi: 10.5281/gsjb.2023.8049987

sense of taste. When you smoke, the chance of your arteries narrowing and clots forming can cause a heart attack or stroke. For so many reasons, this research confirmed. Our analysis of the above writings and many other publications addressing chemicals in tobacco smoke shows that the writings do not address the tendency for damage linked with smokeless and smoking tobacco articles. Tobacco-related microbiological elements include bacteria (gram positive and negative), microorgainsml spores, fungi (yeast and mould), fungal spores, cell wall components (glucans and flagellum), and exotoxins and endotoxins. Endotoxins (lipopolysaccharide, or LPS inflammatory factor) and aflatoxins (AF type B1; human carcinogen) are microorgainsml and fungal-derived toxins, respectively [1–4]. Some microorgainsm thrive in specific microenvironments and are difficult to grow in broth and agar. Acclimating growing microorgainsm to tobacco curing and fermentation conditions may also be challenging. Traditional approaches to characterising tobacco microbiota may fall short [2-3]. Incomplete knowledge of the microorgainsml diversity in tobacco cigarettes and the influence of microorganisms and microbial toxins on smokers [3]. According to the WHO, 10 million people will die from smoking-related illnesses by 2015. Clinical and scientific experts have long studied blood rheology. Biofluids such as blood and plasma have the property of fluid flow resistance. Blood comprises red blood cells, white blood cells, proteins, and several other cell types suspended in plasma. Nearly half of the blood volume is composed of red blood cells. Since it is so concentrated, it has peculiar viscoelastic characteristics. Blood rheology and flow are critical diagnostic and therapeutic tools because blood flow in the circulatory system oxygenates and supplies nutrients to distant organs. Malaria and diabetes modify blood properties and flow behavior. Sickle cell anaemia and hyper viscosity syndrome are intimately linked to blood rheology [4]. Compounds such as formaldehyde and ammonia are the most frequent in tobacco smoke. The less common ones are benzopyrenes, acetones, cadmium, and nitrogen oxide. Tobacco smoke has a high concentration of formaldehyde and ammonia [3]. Benzopyrenes, acetones, cadmium, and nitrogen oxide are a few of the less frequent ones. Nicotine and cigarette smoke carcinogens may cause lung cancer. Nicotine's influence on apoptosis may lead to malignant cell survival and field mutations. Apoptosis kills DNA-damaged cells [7]. According to a toxicology study, 1.0 mg/kg or 60 mg is lethal for adults. 4 to 8 mg of nicotine orally may cause vomiting, high blood pressure, disorientation, convulsions, tachycardia, and atrial fibrillation. Nicotine in candy, gum and e-cigarettes may damage kids. A youngster needs emergency care after 1 g of nicotine [8]. Smoking promotes hypertension, lung injury, and

vasculopathy [9] vascular dysfunction. Cigarette smoking is connected to CVD, PVA, stroke, cognitive impairment, and Alzheimer's. Smoking, which alters cerebral vasculature, raises the risk of cerebrovascular disease. Most cigarette research focuses on peripheral vascular function, not cerebral vasculature. Using transcranial Doppler ultrasonography, a previous study demonstrated that smoking immediately increases blood flow velocity in the middle cerebral artery [10]. There are also additional studies [11]. The blood and plasma viscosity may become less fluid in men with vascular disease as they age and smoke. When people smoke, coronary artery disease and peripheral vascular disease are more likely as people age. Blood and plasma viscosity may be affected by age. Blood and plasma viscosity rose in middle-aged smokers [12]. High-viscosity diseases in smokers might facilitate ischemia and thrombosis because of their elevated blood viscosity variables and functions [13]. Governments, families, and people who are addicted to nicotine pay a social and economic price because of their health, productivity, and life [14].

2. Methods and Materials

1. Instrument & tools

i. Autoclave

ii. Microscopy

iii. Wire loop
iv. Benzene burner
v. Petri dish
vi. Glassware
vii. Incubator
viii. Hood
ix. Capillary Tube
x. Electron Scale
xi. Microcentrifuge haematocrit
xii. Haematocrit reader
xiii. Whole Blood with EDTA
xiv. Lancet

(Test tube, beaker, conical flask, petri dish, Glass slide, Cotton).

2. Media uses (g/l)

i. Nutrient agar
ii. Nutrient Broth
iii. Brain heart infusion agar
iv. Distal water
v. Alcohol

Methods

Sample collection:
A total of 160 samples were collected from various persons in Basra, a southern Iraqi city. There were two sets of samples, one for testing the viscosity of blood and the other for testing the respiratory tract route of active, passive, and non-active smokers.

Methods 1: The total microorgainsml count (TBC) was calculated following the 100 samples were sent to the laboratory the six specimens were isolated using the spread technique on nutritional agar and brain heart infusion agar. After 24-28 hours of incubation at 37 degrees Celsius, the number of positive cultures was utilised to calculate the TBC/g. Cultures were plated on a selective medium such as brain heart infusion agar to isolate single colonies identified using the Gram stain and their corresponding colonial appearance.

Methods 2: A lancet was used to prick 60 blood samples from 160 human fingers after being sterilised. A lancet was used to test blood viscosity. It is typically added to avoid thrombosis. When taking a sample of blood from the very tip of one finger, a capillary tube with an anti-coagulant pad is used to collect the blood. The capillary tube has blood inside, and a clay plug is connected to one end of the tube. Place the sample inside a haematocrit microcentrifuge for five minutes, and set the speed to 12,000 rotations per minute. It must be the open end of the tube capillary in the direction of the axis of rotation, and the end of the tube enclosed with the material used for closure must be on the opposite side (outer side). The hematocrit meter, known as the Hauskeley scale, reads the capillary tube. This number represents the proportion of volume that is comprised of compressed cells. Where the tubes-capillary are placed on the hematocrit to divide the blood column with ruler lines in such a way that the end of the capillary tube containing the clay is placed on No. (0) for the ruler, and the end of the plasma is placed on No. (100) for the ruler. In other words, the end of the plasma is placed at the number (100).

3. Results and discussion

The blood samples were collected from 160 volunteers aged between 18 and 72 years. By examining 60 young adult people of Basra Provence's blood pressure and 100 specimens of microorgainsml isolation from their respiratory tract routes, active smokers, passive smokers, and nonsmokers were examined (Fig 1). *Bacillus, Candida, Corynebacterium, Klebsiella, Diplococci, and Staphylococcus dspp, were found in smokers'* respiratory tract *the results are shown in (Fig 2) and (Table 1) .* The study explains the effect of smoking and the difference in microbial diversity between smokers and nonsmokers. The samples were collected from 30 people, 15 of whom were nonsmokers and 15 were smokers. The packed cell volume (PCV) test was done on these samples as described in the methods section. As shown in (Table 2). The results showed that the percentage of blood viscosity was different between smokers and nonsmokers. The findings (Table 3) ,show that smokers have higher blood viscosity than nonsmokers, and that the severity of high blood viscosity varies with age and gender, as shown in figures (3,4 and 5). In addition to this test, we did a statistical analysis of the effects of smoking on 200 people who had smoked. Most smokers had trouble keeping their balance, felt like they were going to faint or feel dizzy, and were tired all the time. They also felt pain, had headaches, and were lazy and lethargic. These are the most common symptoms among smokers. Other symptoms include blurred vision, red skin, itching, and a

tickling feeling in different parts of the body. Especially in the dependence of red cell accumulation on the level of fibrinogen, blood type O smokers showed higher values than blood type A smokers (P less than 0.01). Increased blood viscosity factors and functions in smokers suggest that the ischemia and coagulation pathways, to which smokers are more susceptible than nonsmokers, may be transmitted through syndromes of high blood viscosity [15].The effects of cigarette smoking and hypertension on hematological variables (blood viscosity across a broad range of shear rates, plasma viscosity, fine protein concentration, and plasma protein concentration) and arterial stiffness (pulse wave velocity) were evaluated in males with 33 individuals with normal pressure and 81 men with moderately high blood pressure. Smoking was a factor in the development of hypertension in 22 patients with hypertension and 24 with problems with hypertension. Smoking cigarettes and high blood pressure were shown to be independently linked with increased blood viscosity at all shear rates (ranging from 0.2 to 241 s-1) and increased plasma viscosity, hematocrit, and pulse wave velocity. Hypertension continued to be related to higher blood viscosity even when hematocrit levels were held constant. However, this connection was no longer present in those who smoked cigarettes. Regular smokers saw the same increase in blood and plasma viscosity as nonsmokers with hypertension did regarding the velocity of their pulse waves. Because no interaction effects of hypertension or cigarette smoking were seen on blood or arterial parameters, this finding suggests that the influence

of these two variables on the rheology of the blood and vascular system is cumulative. Both smoking and hypertension have been shown to affect blood flow characteristics and the behavior of arterial walls, which may explain the arterial damage seen in those who smoke cigarettes and those who have hypertension [16]. To study age, gender, and smoking behaviors in rheology, the authors examined plasma (PV), serum (SV), original viscosity (NBV), and correction (CBV) in 152 blood donors (86 men and 66 women) and 20 healthy participants (4 men and 16 women) attending smoking aversion treatment. Viscosity and erythrocyte sedimentation rate did not alter with age, although hematocrit and fibrinogen concentration did. Men had greater NBV and HC than women, whereas women had higher FC and ESR. Only moderate smoking (12 cigarettes/day) influenced ESR in blood donors, which was greater in smokers than nonsmokers. Heavy smokers (21 cigarettes/day) had greater PV, SV, NBV, FC, and HC than nonsmokers [17]. We studied blood viscosity in 90 healthy men ages 16 to 80. Smoker's blood viscosity, hematocrit, fibrinogen, and plasma viscosity increased. Despite hematocrit, smokers had thicker blood. Both groups' fibrinogen, blood viscosity, and plasma viscosity increased with age, although young smokers showed larger quantities and less significant increases. These results imply age and smoking should be included in blood and plasma viscosity testing and relate viscosity to vascular disease [18,19].

4. Conclusions

According to recent research results, the viscosity of the blood of smokers is noticeably different from that of nonsmokers. Because of smoking, a person's blood will have a higher viscosity if they continue to smoke. The viscosity of the blood increased more quickly among smokers under the age of 19 compared to smokers older than 19 years old. The majority of people who smoke report feeling tired all over, having feelings of lightheadedness or dizziness, as well as pain and headaches.

Fig. 1: Microorgainsm was isolated by spread method on the nutrient agar.

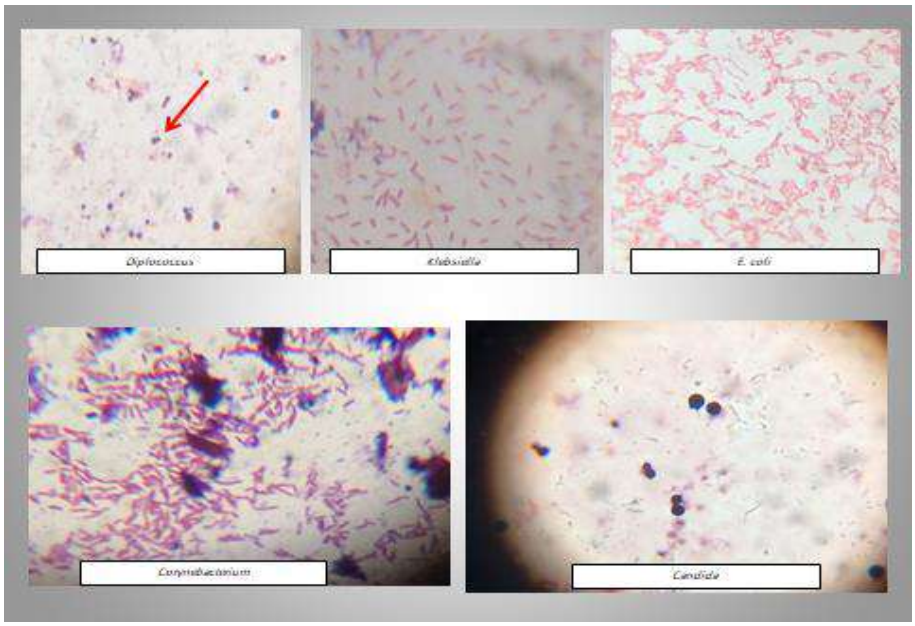


Fig. 2: Microorgainsml cell under the microscope (Gram negative and Gram-positive microorgainsm).

Table 1: show the different kinds of microorgainsml sp. In smoker and nonsmokers

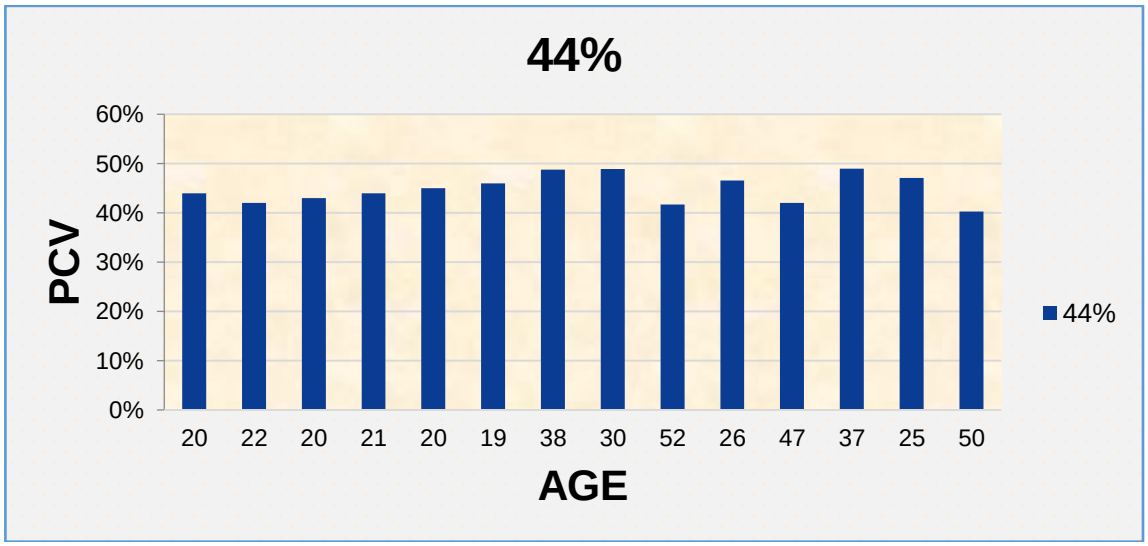
Microorgainsml sp.	Non – smokers				Smokers			
	Number	presence	occurrence	frequency	Number	presence	occurrence	frequency
Bacillus	98	6	9.52	16.9	100	6	9.52	17
candida	6	3	4.76	1	95	6	9.52	16.2
Corynebacterium	-	-	-	-	85	6	9.52	14.4
Diplococci	6	3	4.76	1	55	6	9.52	9.4
Klebsiella	20	3	4.76	3.4	60	9	14.3	10.3
Staphylococcus	18	6	9.52	3	40	9	14.3	6.8
Total	148	21	33.2	25.8	435	42	66.8	74.2

Table 2: The table shows the difference in PCV from the normal percentages for non-smokers .

Number of samples Colaction	Age	**Blood viscosity Non-smokers**
5	20	44%
4	22	42%
3	20	43%
1	21	44%
1	20	45%
2	19	46%
2	38	48.8%
2	30	48.9%
1	52	41.7%
2	26	46.6%
2	47	42%
1	37	49%
1	25	47.1%
1	50	40.3%
2	31	47.7%
30		
SAMPLES TOTAL		

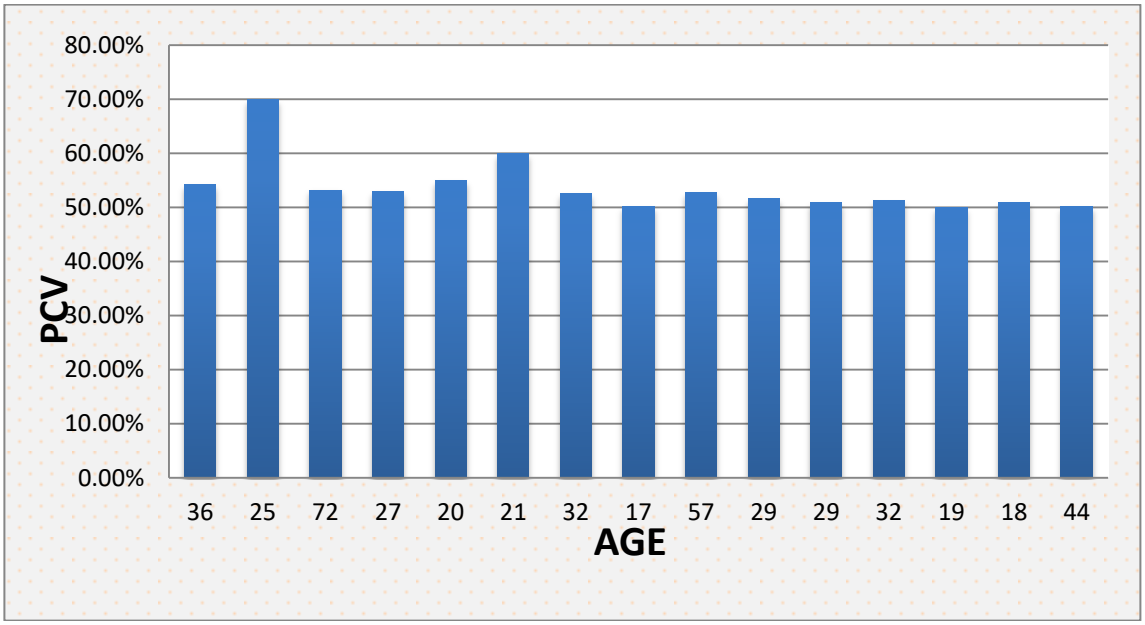
Table (3): The table shows the difference in PCV from the normal percentages for smokers

Number of samples Colaction	Age	**Blood viscosity Smokers**
2	36	54.3%
3	25	70%
5	72	53.2%
2	27	53%
2	20	55%
2	21	60%
1	32	52.6%
3	17	50.2%
4	57	52.8%
1	29	51.6%
1	29	51.0%
1	32	51.3%
1	19	50%
1	18	51%
1	44	50.2%
30		
SAMPLES TOTAL		



*PCV: PACKED CELL VOLUME

Fig 3. Blood viscosity for age for nonsmokers



*PCV: PACKED CELL VOLUME

Fig. 4. Blood viscosity for age for nonsmokers.

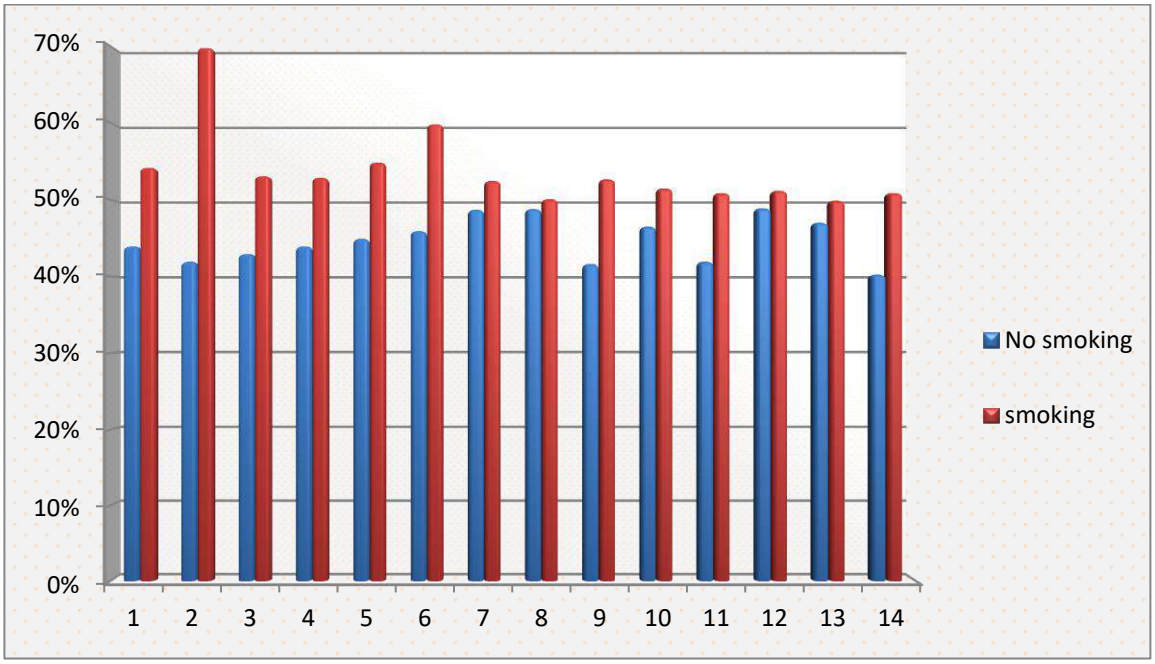


Fig. 5. The difference between the blood viscosity of smokers and nonsmokers

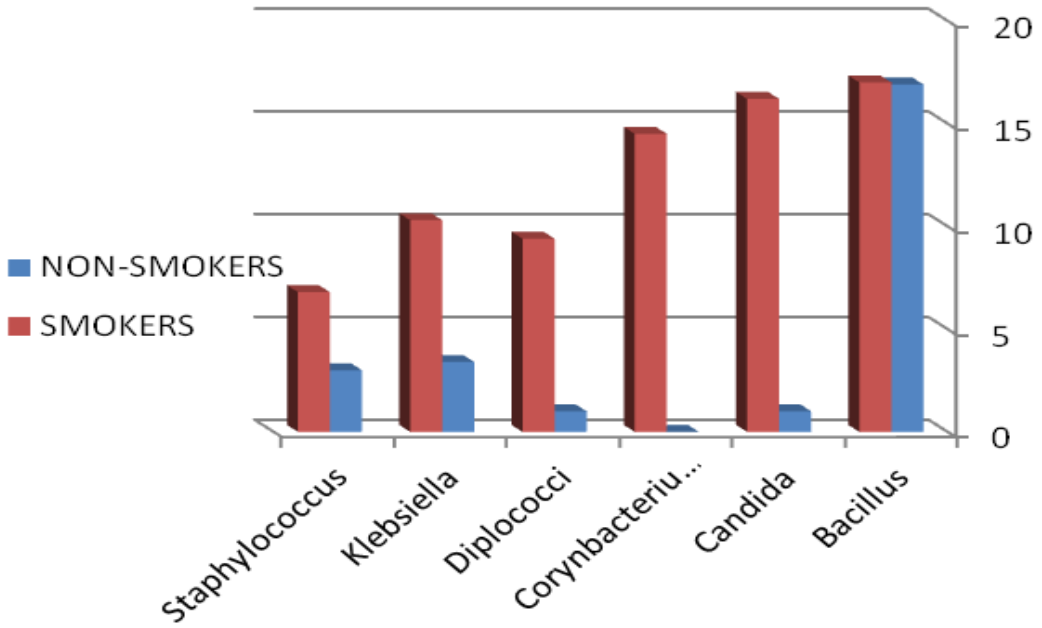


Fig. 6. Frequency of Microorgainsml genus in Smokers and non- Smokers

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