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RESEARCH ARTICLE
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PREVALENCE OF HOOKAH SMOKING AND ITS ASSOCIATION WITH ANEMIA IN WOMEN OF REPRODUCTIVE AGE GROUP

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Abstract:
Background: Smoking (Hookah) is common in Pakistan even among women of reproductive age group so this study was conducted to determine the prevalence of Hookah smoking and its association with Anemia among Women of reproductive age group.
Methodology: A cross-sectional study was conducted at the Department of Gynecology and Obstetrics, Teaching Hospital, Hub, Balochistan from January 2021 to March 2021. 234 non-pregnant Female participants aged less than 40 who were not taking any medications for anemia were included in the study. After taking a detailed history and sociodemographic data, a venous blood sample of 3cc was taken and was analyzed for hematological parameters. The mean difference of hematological parameters among Hookah smokers and non-Hookah smokers and the association of Hookah Smoking with Residence, Literacy Level, Family Type, and Anemia was analyzed using SPSS version 23.
Results: In this study, it has been found that 13.7% of rural participants were smokers while 22.2% of urban participants were smokers. There were 51.3% of our participants were anemic, among these 23.1% were smokers while 28.1% were non-smokers and the association between these two parameters has p p-value of 0.003 which is statistically significant. The association between normocytic and microcytic anemia among smokers and non-smokers also shows significant results having a p value of 0.006. MCV and MCHC values were also significantly less among hookah smokers as compared to non-smokers having p-value>0.05.
Conclusion: We conclude that an association exists between hookah smoking and hematological parameters like hemoglobin concentration. MCV, MCH, and MCHC.

Keywords: Hookah smoking, Hemoglobin, Reproductive age group, Anemia

INTRODUCTION:

World Health Organization has reported that people around 5 Million face mortality around the globe and this number keeps on increasing with the increased habit of smoking [1]. Smoking has serious

lethal effects not only on effecting lungs as in the case of chronic obstructive pulmonary disease but also involved in pathologies like cancer, pancreatitis, periodontal disease, metabolic syndromes, gastritis, and autoimmune diseases [2-6]. Smoking is also responsible for certain cardiovascular diseases like Myocardial infarction, Atherosclerosis, Ischemic heart disease, and stroke [7]. These morbidities are suspected due to oxidative stress, inflammation, and impaired thrombolysis.

Tobacco smoking is a preventable cause of certain morbidities. Tobacco smoke has more than 4000 components that have adverse effects on human health among these components free radicals, nicotine, and carbon monoxide are more lethal to health [8]. Free radicals and oxidative stress are connected with the physiological synthesis of Thromboxane, prostacyclin, and prostaglandins which can alter the inflammatory status of blood and blood vessels thus causing increased leucocyte count [9,10].

Anemia is a significant health problem around the globe and it has been found that it affects 22.8% of the world population [11]. The prevalence of Anemia is highest in South Asian countries in the world female population, which results in high morbidity, high mortality rate, and low birth weight. In Pakistan, it is estimated that 61.3% of the women of the reproductive age group living in rural areas are suffering from anemia [12]. Anemia can occur due to nutritional deficiency, bone marrow disorders, Genetic disorders, and due to hemorrhages. Due to the high prevalence of anemia it can affect the physiological functions of people worldwide.

Tobacco smoking as in the case of hookah smoking can also alter RBCs and hemoglobin concentration [13]. It is believed that tobacco smoking alters hematocrit as a compensatory mechanism due to exposure to carbon monoxide and free radicals [14]. In Hookah smoking carbon monoxide binds with hemoglobin thus causing a compensatory change in hemoglobin concentration but this mechanism could have adverse on the hematological parameters of smokers [15].

The adverse effects of tobacco smoking have been widely studied on different organs and systems like the respiratory system and cardiovascular system but the effect of hookah smoking on hematological parameters has shown inconsistent results, so the present study explains the effect of tobacco smoking (Hookah) on certain hematological parameters like Anemia.

METHODOLOGY:

A cross-sectional study was conducted at the Department of Gynecology and Obstetrics, Teaching Hospital, Hub, Balochistan from January 2021 to March 2021 for a period of three months after getting approval from the institutional ethical committee. A total of 234 female participants were included in this study after getting informed consent using a convenient purposive sampling technique. Female participants aged less than 40, who were not taking any medications for anemia and, non-pregnant females were included in the study. After taking a detailed history and filling the sociodemographic proforma, a venous blood sample of 3cc was taken and was analyzed for hematological parameters using an automatic hematological analyzer. Qualitative parameters were measured in frequencies. Association of Hookah Smoking with Residence, Literacy Level, Family Type & Anemia was analyzed using the Chi-square test, and Fischer extract test. Odd Ratio and p-value were determined. In the dependent sample, a t-test was used to determine the mean difference of hematological parameters among Hookah smokers and non-hookah smokers participants. SPSS version 23 was used to analyze the data.

RESULTS:

In this study mean age of a total of 234 participants was 27.02 ± 4.70 and among these participants, 36.8% belonged to rural areas while 63.2% were from the urban population. Among our participants 27.4% were literate, 72.60% were illiterate and the majority of our participants were living in a combined family system i.e. 85.5% while 14.5% were living in a nuclear family system. In this study, it has been found that 13.7% of rural participants were smokers while 22.2% of urban participants were smokers, whereas 26.5% of the smokers were illiterate while 9.4% of the smokers were literate. 51.3% of our participants were anemic and among these, 23.1% were smokers while 28.1% were non-smokers and association between these two parameters has p p-value of 0.003 which is statistically

significant. The association between normocytic and microcytic anemia among smokers and non-smokers also shows significant results having a p-value of 0.006. According to Table III Hemoglobin concentration in Hookah smokers was less as compared to non-smokers, while MCV and MCHC values were also significantly less among hookah smokers as compared to non-smokers having p-value>0.05.

Table I: Sociodemographic Data of Study Participants.

Age in years (Mean ± SD)	**27.02 ± 4.70 (N = 234)**
Residence	
Rural	**86 (36.8%)**
Urban	**148 (63.2%)**
Literacy Level	
Literate	**64 (27.4%)**
Illiterate	**170 (72.60%)**
Family Type	
Combined	**200 (85.5%)**
Nuclear	**34 (14.5%)**

Table II: Association of Hookah Smoking with Residence, Literacy Level, Family Type & Anemia.

Variable	Hookah Smoker	Non-Hookah Smoker	Chi-square X^2	Odd Ratio	p - Value
Residence					
Rural	32 (13.7%)	54 (23.1%)	0.102	0.91	.75
Urban	52 (22.2%)	96 (41%)			
Literacy Level					
Literate	22 (9.4%)	42 (17.9%)	0.089	0.912	0.766
Ill literate	62 (26.5%)	108 (46.2%)			
Family Type					
Combined	74 (31.6%)	126 (53.8%)	0.727	1.41	0.394
Nuclear	10 (4.3%)	24 (10.3%)			
Anemia status					
Anemic	54 (23.1%)	66 (28.2%)	8.87	2.29	**0.003***
Non-Anemic	30 (12.8%)	84 (35.9%)			
Classification of Anemia					
No Anemia	30 (12.8%)	84 (35.9%)	16.16		**0.006***
Mild Microcytic Anemia	16 (6.8%)	32 (13.7%)			
Mild Normocytic Anemia	8 (3.4%)	10 (4.3%)			
Moderate Microcytic Anemia	24 (10.3%)	20 (8.5%)			
Moderate Normocytic Anemia	02 (0.9%)	00 (0%)			
Severe Microcytic Anemia	04 (1.7%)	04 (1.7%)			

Severe Normocytic Anemia	00 (0%)	00 (0%)			

Table III: Mean difference of hematological parameters among Hookah smokers and non-Hookah smokers' participants.

Variable	Hookah Smokers (Mean ± SD) n = 84	Non Hookah Smokers (Mean ± SD) n = 150	p-Value
Age (Years)	26.40 ± 5.12	27.37 ± 4.40	.131
Haemoglobin (g/dl)	11.2 ± 1.9	11.78 ± 1.41	**.010***
RBC's (million/mm3)	4.74 ±.74	4.75 ± .61	.897
Haematocrit (%)	35.49 ± 5.08	36.48 ± 4.12	.181
MCV (µm3)	71.91 ± 7.07	78.11 ± 9.40	**.000***
MCH (pg)	26.55 ± 12.26	28.68 ± 15.32	.470
MCHC (%)	31.35 ± 2.27	32.77 ± 4.53	**.008***
Platelets (10^9/L)	281 ± 84.30	292 ± 77.88	.313
WBC's (per mm3)	7.74 ± 2.09	7.51 ± 2.40	.461
Lymphocytes (%)	33.98 ± 7.93	35.30 ± 8.96	.264
Neutrophils (%)	52.69 ± 10.76	54.49 ± 10.12	.208

Discussion:

In this study, it has been observed that several hookah smokers are alarmingly high in rural as well as urban populations in Balochistan. In this study, we have found that 84 out of 234 participants of our study were hookah smokers and that high prevalence of hookah smoking is indicated by another study conducted by Sakineh et al. stating that 4% of women in Pakistan are smokers and this high number is not only in this region but present in south Asia and Arab world [16, 17]. According to WHO hookah smoking began to be used in the reign of King Akbar (1556-1605) assuming that it is safe to use as compared to cigarette smoking but its hazardous effects cannot be denied due to its addiction and nicotine-causing morbidities [18].

The results of our study indicate that tobacco smoking affects hematological factors. This study shows that the prevalence of low hemoglobin concentration is higher in women using a hookah and these results were also found in a study conducted by kaur et al in Jat women of Haryana, India [19]. In the present study, after evaluating confounding factors like age, literacy, family type, and rural or urban status hookah smoking influences anemia and hematological parameters. Another study conducted by ankur et al found that iron deficiency anemia is more common among smokers either using either cigarettes or beedi than the non smokers [20]. Our study also proposed that anemia is predominantly present in those using hookah for tobacco smoking. In another study conducted by Maeve et al Found that tobacco smoking is responsible for Megaloblastic anemia and this hazardous effect on Erythrocytes is due to the presence of acetaldehyde in tobacco smoke, which is consistent with the significant results of our study [21].

There are limited studies showing the effect of hookah smoking on anemia of the reproductive age group, current study suggests protecting women of the reproductive age group from the hazardous effects of hookah smoking. The Law of Pakistan prohibits the usage of tobacco and also advertises the hazardous effects of tobacco smoking on its sales counter, so this study enlightens the necessity of social awareness and campaigns to avoid hookah smoking in any age group to protect our nation from harmful effects of tobacco use.

Conclusion:

Tobacco use in any form like cigarette or hookah is hazardous for health and not only effects viscera but also effects hematological parameters like hemoglobin concentration, MCV, MCH and MCHC.

Conflict of Interests:

It is declared that this work's collaborators have no conflict of interest and nothing to disclose.

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