Research Article

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Maternal tobacco smoking among pregnant Egyptian women: Risk for women and newborns (A cross sectional study).

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ABSTRACT

Aim: to investigate the patterns of maternal smoking during pregnancy and to address specific adverse pregnancy outcomes among women in Egypt.
Patients and Methods: it is a cross-sectional study on 100 pregnant smoker and 50 pregnant nonsmoker women, they were recruited from outpatient clinics in Al-Azhar and Ain Shams university hospitals over a period of 3 months. Women were subjected to detailed history, examination and Ultrasound. Blood samples were collected for serum lipids, Malondialdehyde, Superoxide dismutase, Glutathione peroxidase, and urine for hydroxy-2-deoxyguanosine.
Results: Of the 150 pregnant women who participated in this study, 79 were current smokers, and 21 were former smokers. Pregnant smokers were more likely than nonsmokers to have increased oxidative stress markers and gestational blood lipids (except HDL which was low), hypertensive disorders during pregnancy, gestational DM, abortions, stillbirths, premature birth and low birth weight in the newborn (P value< 0.05).
Conclusion: According to this report, smoking while pregnant is a serious public health issue. The high prevalence of maternal smoking during pregnancy and the detrimental effects it has on the fetus highlight the pressing need for ongoing and successful cessation programs. Egyptian women should be the target of prevention initiatives since they have the highest smoking risk.

Keywords: *pregnancy, smoking, water pipe, preterm, Egypt.*

INTRODUCTION

At the dawn of the 20th century, the most common tobacco products were cigars, pipe tobacco, and chewing tobacco. (1). Despite the fact that LMICs (low- and middle-income countries) are home to more than 80% of the world's smokers (2), population-based data about the prevalence of tobacco use among pregnant women in these nations is inadequate. According to data from the 2008–10 Global Adult Tobacco Survey of 14 LMICs, the prevalence of current tobacco smoking among women of reproductive age ranged from 0·4% in Egypt to 30·8% in Russia. Similarly, the use of smokeless tobacco was uncommon in most countries, but was common in Bangladesh (20%) and India (15%). Good monitoring tracks the extent and character of the tobacco epidemic and indicates how best to tailor policies. Almost half of the world's population are regularly asked about their tobacco use in nationally representative surveys among adults and adolescents (3).
Pregnancy complications (such as placenta praevia, placental abruption, and pre-eclampsia) and poor fetal outcomes (such as low birthweight, premature birth, and overall perinatal mortality) are among the known risks associated with tobacco use during pregnancy (4) (5,6).
Although it has been less researched, using snuff or chewing tobacco during pregnancy has been linked to lower

The American Journal of Public Health (ISSN 3064-6677)

birthweight, premature delivery, and stillbirth (7).

Given the inadequate prenatal care capabilities and unfavorable pregnancy outcomes in many LMICs, it is especially critical to determine which areas of the world pregnant women most require smoking cessation therapies (8–11). Nonetheless, there are no population-based figures available for LMICs regarding tobacco use during pregnancy.

Our objectives were to look at the trends of maternal smoking during pregnancy and to address particular unfavorable pregnancy outcomes among Egyptian women.

PATIENTS AND METHODS

Study design and setting

A cross-sectional study was carried out in several health clinics at the Al-Azhar and Ain Shams university hospitals in Egypt over a period of 3 months to ascertain the smoking patterns and related hazards of maternal tobacco use among pregnant Egyptian women.

Study tool

Owing to the stigma attached to tobacco use among women, a pilot study was carried out to examine the smoking habits and associated hazards of Egyptian pregnant women who smoke.

Any lady who smoked cigarettes or a waterpipe while pregnant was considered a current smoker. Any tobacco user who had given up smoking during or before to their pregnancy was considered a former smoker. Any lady who had never smoked a waterpipe or cigarettes was considered a nonsmoker.

The purpose of this study was to evaluate particular negative consequences among Egyptian pregnant women as well as patterns of maternal smoking during pregnancy.

The specific goals were to identify the elements that influence pregnant women's smoking of cigarettes and waterpipes and to demonstrate a link between the mother's behavior and the child's outcomes.

The inquiry, "Are you pregnant now?" yielded the answers, "yes," or "no or unsure," and allowed women to self-report their current pregnancy status.

Questions about age at beginning, status as a past smoker, and age at quitting were given to the participants, with responses limited to "yes" or "no." They were also asked if they currently use cigarettes, pipes, or other tobacco products peculiar to their country, or if they use nothing at all.

If a pregnant woman answered "yes" when asked if she had smoked cigarettes, pipes, or other nationally designated smoking products, she was labeled as a "tobacco smoker." If a pregnant woman answered "yes" when asked if she used chew, snuff, or other smokeless tobacco products unique to her country, she was labeled as a "smokeless tobacco user." "Any tobacco users" refers to pregnant women who use smokeless or traditional tobacco products.

The participants' residences were divided into civil and rural categories. Self-reports of the finished educational level (primary, secondary, or higher) were used to evaluate the maternal education. "What is your primary occupation, or class of work?" was the question used to gauge maternal occupation.

The pre-pregnancy weight, pre-pregnancy body mass index (BMI), height, week of delivery, mode of birth, mode of conception, history of smoking, pregnancy comorbidities, number of pregnancies, number of miscarriages, and prior history were all considered general clinical data. At 28–32 weeks of pregnancy, lipid indicators included triglycerides (TG), high density lipoprotein (HDL), low density lipoprotein (LDL), and cholesterol (CHOL), as well as malondialdehyde, hydroxy-2-deoxyguanosine in urine, glutathione peroxidase, and superoxide dismutase. A fetal weight and deformity check was conducted using ultrasound.

Estimation of Oxidative stress markers

Malondialdehyde (MDA): MDA was estimated by its thiobarbituric acid reactivity using spectrophotometric method using commercially available kit (Biodiagnostic, Egypt). Briefly, the assay measures the reaction of MDA with thiobarbituric acid (chromogenic substance) in acidic media at temperature 95°C for 30 min to form thiobarbituric acid reactive product, the absorbance of the resultant pink product was measured at 534 nm.

Urinary 8-hydroxydeoxyguanosine (8-OHdG):8-OHdG was determined using high performance liquid chromatography with electrochemical detection (HPLC-EC) according to [26]. 8-OHdG was assayed in urine sample using commercially available kit (Sigma Chemicals St. Louis, MO, USA).

Superoxide dismutase (SOD): SOD activity was determined using diagnostic kit RANSOD produced by RANDOX (Randox Laboratories Ltd., Crumlin, County Antrim, UK) according to Arthur and Boyne and expressed in U of SOD/10 mg of protein.

Glutathione peroxidase (GPx):GPx activity was determined using diagnostic kit RANSEL produced by RANDOX (Randox Laboratories Ltd., Crumlin, County Antrim, UK) according to Paglia and Valentine and expressed in U of GPx/mg of protein. Protein was measured using the Bradford method.

Estimation of lipid profile

Concentration of serum total cholesterol and HDL was determined by Zak's method.

Concentration of serum LDL and VLDL cholesterol was determined by Friedwald's formula.

Concentration of serum triglyceride level was determined by enzymatic end point peroxidase coupled method.

The American Journal of Public Health (ISSN 3064-6677)

Statistical analysis

An investigation report form was filled up using the information that was gathered. Version 15.0 of SPSS® for Windows® (SPSS, Inc., USA) was used to analyze the data. The mean and standard deviation (SD) were used to describe quantitative (numerical) variables. The qualitative (categorical) data were described using statistics and percentages. The students' unpaired t-test was utilized for the analysis of numerical variables. Fischer's exact test and the Chi-squared test were used to analyze categorical data. A significance threshold of 0.05 was used.

RESULTS

Table 1: the demographic data of women under study

Character	Group I (n=100)	Group II (n=50)	P value
Residency			> 0.05
• City	72	33	
• Village	28	17	
Occupation			
• Worker	61	35	
• Housewife	39	15	
Education			> 0.05
• Basic	53	34	
• Secondary	27	8	
• High	20	8	
Mean age	34.56±9.14	33.9 ± 9.8	> 0.05
BMI	21.6 ± 3.71	22.1 ± 3.6	> 0.05

Table 1 shows that there was no statistically significant difference between the two groups as regards the site of residency, occupation, level of education, mean age and BMI (P> 0.05).

Table 2: characters of smoking in the study group (group I).

Character	value
Mean Age Of Starting Smoking	21.12±7.09
Smoking	
• Cigarette	18
• Water pipe	9
• Combined	73
Pattern of smoking	
• Current smoker	79
• Former smoker	21
Motivation to smoke	
• Habit	61
• Due to social acceptability	18
• Relieving stress	73
• Losing weight	23
• Imitation	45
• For prestige	11
Motivation to quit	
• Harmful to her body	58
• Harmful to her fetus	69
• Expensive	71
• Socially unacceptable	34
• Having a disease	21

Table 2 describes the smoking patterns of the study group as regards the mean age of starting smoking, current or former smoker, and motivation to smoke and motivation to quit.

The American Journal of Public Health (ISSN 3064-6677)

Table 3: Maternal and fetal outcomes.

Character	Group I (n = 100)	Group II (n = 50)	P value
Hypertension	17	4	< 0.05
Diabetes Mellitus	13	3	< 0.05
Lab investigations (mean ± SD)			
• Triglycerides (mg/dl)	361 ± 63.1	284 ± 32.5	
• Total cholesterol (mg/dl)	198.45 ±26.9	154.61± 18.98	
• HDL (mg/ml)	35.8 ± 4.6	61.2 ± 7.5	
• LDL (mg/ml)	161.7 ± 17.4	137.2 ± 11.4	
• Malondialdehyde (µmoles/l)	38.4 ± 4.92	31.2 ± 2.8	
• hydroxy-2-deoxyguanosine (8-ohg)in urine (ng/g creatinine)	43.9 ± 15.4	37.5 ± 10.3	< 0.05
• Superoxide dismutase (units/ml)	20.1 ± 10.3	14.4 ± 6.4	
• Glutathione peroxidase (U/g Hb)	81.2 ± 11.36	68.3 ± 8.5	
Obstetric history			
• Abortions	59	16	
• Preterm	31	12	< 0.05
• Still birth	19	5	
• At least one baby died immediately after birth	18	5	
• At least one child died before 5 years of age	9	2	
Current pregnancy			
• Abortion	12	3	<0.05
• Preterm labor	11	2	<0.05
• IUFD	9	1	<0.05
• 4D US			
✧ IUGR	31	6	<0.05
✧ Mean placental weight at birth (g)	382 ± 103	511 ± 89	<0.05
✧ CFMF			
√ Heart defects	1	0	<0.05
√ Cleft lip or palate	1	0	
√ Limb reduction defects	0	0	

Table 3: it describes the maternal and fetal effect of smoking. Hypertension and smoking was more prevalent in group I. Blood lipids (except HDL), Malondialdehyde, hydroxy-2-deoxyguanosine in urine, Superoxide dismutase, Glutathione peroxidase were higher. As regards the obstetric history; abortions, preterm, still birth, at least one baby died immediately after birth and at least one child died before 5 years of age; all were higher among the smokers than nonsmokers with a statistically significant difference (P<0.05). In the current pregnancy; abortions, Preterm labor, IUFD, IUGR and small placental weight at birth were more prevalent in group I than group II (P< 0.05). There was no statistical significant difference between the two groups in the incidence of CFMF.

DISCUSSION

This study produced a number of noteworthy findings regarding smoking patterns, the mean age at which smoking commenced, incentive to smoke, and motivation to quit. One of the most significant obstacles to forecasting a shift in the incidence of maternal smoking during pregnancy and the dangers associated with it in this area was the paucity of prior research. Many of the pregnant women in this study continued to smoke during their pregnancy, despite the fact that the majority of them were aware of the risks smoking poses to both their health and the health of their fetuses.

The findings of this study corroborate those of other research showing a higher likelihood of tobacco use among employed and highly educated women. According to these findings, smoking by women is becoming more socially acceptable as societal and cultural norms that have historically forbade it are eroding, particularly for educated and working women (10).

Individual characteristics may have an impact on smoking and the desire to stop smoking, including knowledge, risk perception,

The American Journal of Public Health (ISSN 3064-6677)

attitudes, motivation, and social influence. Many of the pregnant women in this study continued to smoke during their pregnancy, despite the fact that the majority of them were aware of the risks smoking poses to both their health and the health of their fetuses.

While the majority of previous research has focused on developing nations, other factors have also been identified as contributing to the rise in female smoking rates. The majority of pregnant women smoked, according to the study's results, which are consistent with earlier research, as a coping strategy for stress, low income, poverty, inadequate infrastructure, and dense population. Peer and social pressure from peers and family are other influences. It is well known that in eastern culture, married women are more likely than unmarried women to smoke. This may also account for the late age at which smoking cigarettes begins (11).

We discovered that smoking raises blood lipids (other than HDL), hydroxy-2-deoxyguanosine in urine, superoxide dismutase, glutathione peroxidase, and pregnancy hypertension and diabetes.

There is conflicting evidence regarding the effects of smoking. While some studies have found that smoking lowers total cholesterol, LDL-C, HDL-C and malondialdehyde, hydroxy-2-deoxyguanosine in urine, superoxide dismutase, glutathione peroxidase, and smoking also raises total cholesterol, LDL-C, and triglyceride while lowering HDL-C levels [12, 13]. Even after adjusting for age, sex, and BMI, which are possible confounders, this difference was still seen [15]. The correlation between serum lipid levels and other variables, such as alcohol consumption and the use of hookahs—water pipes used to consume tobacco that has been specifically prepared and carries the same health risks as cigarettes—may be the cause of this, at least in part [16].

Active smoking during pregnancy has been linked to a considerable increased risk of unfavorable pregnancy outcomes, including low birth weight (7), preterm birth, fetal problems (18), and perinatal death (19, 20). These findings are consistent with previous research. This study demonstrates that smoking raises Egyptian women's chance of unfavorable pregnancy outcomes.

Smoking is more prevalent at work, in public spaces, and at home, which may be connected to social norms.

Worldwide, pregnant women with lesser levels of education typically have higher rates of smoking (21-23). There are several possible causes for this. First off, it's possible that these women don't have as much access to information regarding the risks associated with smoking at work and in schools. They might also be more vulnerable to peer pressure and social pressures, which would make it simpler for them to start smoking. Second, smoking is more common among those with lower socioeconomic standing. This can be as a result of the many obstacles people encounter when trying to get work, an education, and other resources.

Lastly, some cultures could support smoking or be ignorant of the risks associated with it. Lower educated pregnant women in these communities might be more vulnerable to this social impact (24).

Abortions were more common in smokers than in non-smokers. This outcome is consistent with the majority of research findings (21). It was shown that infants born to smokers who were smoking continuously had smaller birth weights and substantially earlier gestational ages.

Numerous investigations on the risk of low birth weight and early birth in smokers have supported this conclusion (25).

Pregnant women are advised to abstain from smoking during their pregnancy and to enhance prenatal care and fetal monitoring to guarantee the health and regular development of fetuses, as well as the wellbeing of both moms and babies. Smoke and tobacco products include thousands of harmful and cancer-causing substances. Exposure to tobacco and smoke during pregnancy can result in the absorption of hazardous materials through the skin or respiratory system, which can then enter the blood circulation system and penetrate the placental barrier. This can have an adverse effect on the growth and development of the fetus (26, 27). Pregnant women should therefore stay away from secondhand smoking in order to safeguard their health and the health of their unborn children.

According to our research, active smoking during pregnancy has a greater negative impact on the health of the mother and the unborn child, which is in line with other studies (17,21, 28). Research has indicated that infants born to mothers who smoke during their pregnancy have an increased risk of preterm birth, low birth weight, and intrauterine development restriction. Furthermore, smoking raises the possibility of birth defects that harm a fetus's development and health, such as neural tube defects and cardiac malformations (29, 30). We must continue to push for the establishment of smoke-free spaces in the future. For instance, the government ought to tighten tobacco control rules and regulations, raise public health awareness, and assist more individuals in realizing the dangers of both active and passive smoking. Families, workplaces, and communities should also aggressively support the establishment of smoke-free spaces, motivate smokers to give up, and offer pregnant women safe, smoke-free living quarters.

Limitations of the study

A thorough statistical analysis is not possible due to the study's tiny sample size. Second, we restricted the scope of our research to a small number of perinatal outcomes and ignored potential smoking-related pregnancy problems such heart disease and maternal anemia. Thirdly, the majority of the data on smoking habit during pregnancy came from

self-reports, which can have biases such under- or incorrect-reporting. The tiny percentage of smokers who are currently active in our cohort may have reduced the statistical ability to identify specific relationships, among other limitations.

Furthermore, due to variations in smoking habits, healthcare systems, and other factors, the generalizability of our findings to other nations and populations may be constrained.

CONCLUSIONS

We looked into whether or not pregnant women were currently smoking as well as how smoking affected the course of the pregnancy. Based on the findings, there was a higher chance of unfavorable pregnancy outcomes when smoking actively. By offering information on the connection between maternal smoking during pregnancy and birth outcomes, this study can assist healthcare providers in creating more potent plans to address these problems and enhance the health of expectant mothers and their unborn children.

Conflicts Of Interest

The authors declare that there is no conflicts

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Ethical Approval And Informed Consent

Ethical approval was obtained from the local Ethics Committee

Data Availability

The data supporting this research cannot be made available for privacy or other reasons.

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The American Journal of Public Health (ISSN 3064-6677)

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