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ANALYSIS OF SECOND-HAND TOBACCO SMOKE AND NICOTINE LEVELS ON PREGNANCY OUTCOMES AND INFANT HEALTH

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Abstract:

Objective: *The main objective of the study is to find the effect of second-hand tobacco smoke and nicotine levels on pregnancy outcomes and infant health among local population of Pakistan.* ***Material and methods:*** *This cross-sectional study was conducted in Shaikh Zayed Medical College and Hospital Rahim Yar Khan during September 2019 to January 2020. This study was done with the permission of ethical committee of hospital. The data was collected from 100 pregnant females who visited the OPD of hospital. The data was collected through a questionnaire. This questionnaire includes the demographic data of all the participants. The self-administrated questionnaire included medical and lifestyle variables, such as demographics, ages of both male and female partner, medical and reproductive history, smoking history and duration of infertility.* ***Results:*** *The data was collected from 100 pregnant females who were second hand smokers. These women were non-smoker pregnant women and exposed to cigarette smoking and suffer from complications during childbirth. The mean age of mothers, was 27.38±5.5 years (range from 13 to 45 years). The mean number of pregnancies was 1.91 ± 0.99 (range from 1 to 5). The mean parity was 1.77 ± 0.84 (range from 0 to 5). 14.2% (213) of women were SHS exposure during pregnancy and 85.8% (1287) were not.* ***Conclusion:*** *It is concluded that non-smoking pregnant women in Pakistan who lived with a smoking husband were highly exposed to SHS, especially from their husbands. In addition, non-smoking pregnant women have inadequate knowledge on the harms of SHS.*

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INTRODUCTION:

Smoking during pregnancy is associated with various adverse effects on pregnancy and fetal development, carries a lot of serious complications such as spontaneous abortion, placental abruption, and reduced birth weight of the newborn. Children of smoking mothers have an increased risk of premature birth, low birth weight, sudden infant death syndrome and respiratory diseases during infancy[1]. Smoking also causes long-term risk of maternal health problems such as: heart disease, cancer, emphysema, chronic obstructive pulmonary disease and higher mortality rate[2]. Because women are more likely to quit smoking during pregnancy than at any other time, there are attempts to increase motivation and help them to stop smoking at the procreative phase of their life[3].

There is growing concern surrounding potential adverse reproductive health effects and pregnancy outcomes resulting from exposure to second-hand tobacco smoke[4]. Although exposure to second-hand tobacco smoke is preventable, it remains prevalent. The majority of second-hand tobacco smoke is in the form of side stream smoke generated from the burning end of a lighted cigarette, whereas the remainder is composed of mainstream smoke exhaled by individuals actively smoking[5]. Both mainstream and side stream smoke contain thousands of compounds many of them are harmful to humans[6-7].

Aims and objective

The main objective of the study is to find the effect of second-hand tobacco smoke and nicotine levels on pregnancy outcomes and infant health among local population of Pakistan.

MATERIAL AND METHODS:

This cross-sectional study was conducted in Shaikh Zayed Medical College and Hospital Rahim Yar Khan during September 2019 to January 2020. This study was done with the permission of ethical committee of hospital. The data was collected from 100 pregnant females who visited the OPD of hospital. The data was collected through a questionnaire. This questionnaire includes the demographic data of all the participants. The self-administrated questionnaire included medical and lifestyle variables, such as demographics, ages of both male and female partner, medical and reproductive history, smoking history and duration of infertility. Clinical pregnancy was determined by ultrasound visualization of a gestational sac and a fetal heartbeat. The samples, based on exposure to cigarette smoking, were divided into two groups: passive smoking-exposed and control groups and outcomes of maternal and neonatal complications, (Preterm Delivery, gestational age, rupture of membranes before the onset of labor, or up to 37 weeks of gestation (PROM), Stillbirth, Baby's head circumference, birth weight and length) in two groups were compared.

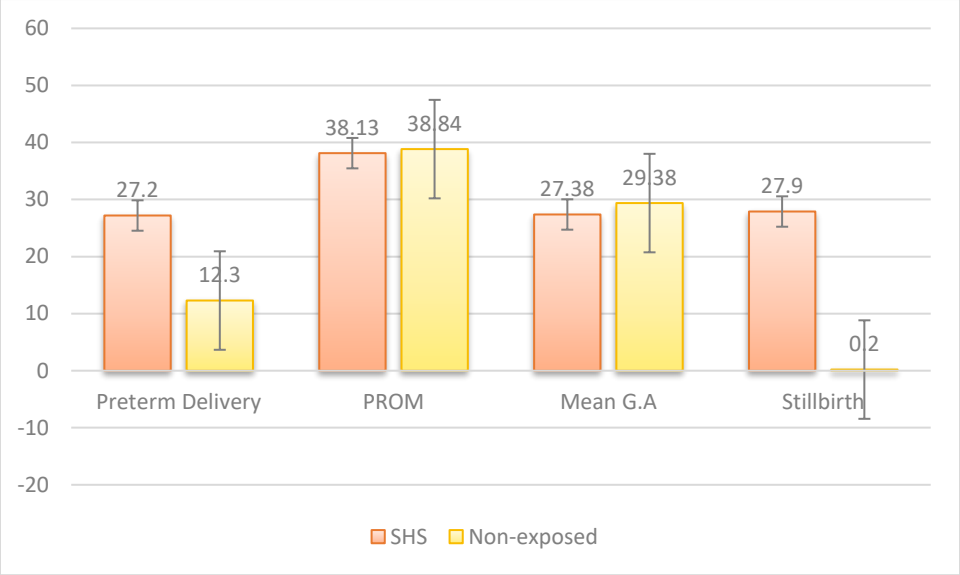
Statistical analysis

Statistical analysis was performed with SPSS 17.0 software (Chicago, IL). Results are reported as median, geometric mean or numbers with percentages. Categorical data were analyzed using chi-squared analyses, and continuous variables using independent Student's t-tests. Spearman's rank correlation was used to assess the relation between self-reported exposure and nicotine levels.

RESULTS:

The data was collected from 100 pregnant females who were second hand smokers. These women were non-smoker pregnant women and exposed to cigarette smoking and suffer from complications during childbirth. The mean age of mothers, was 27.38±5.5 years (range from 13 to 45 years). The mean number of pregnancies was 1.91 ± 0.99 (range from 1 to 5). The mean parity was 1.77 ± 0.84 (range from 0 to 5). 14.2% (213) of women were SHS exposure during pregnancy and 85.8% (1287) were not.

Factor	SHS	Non-exposed	P-values
Preterm Delivery	27.2	12.3	<0.001
PROM	38.13 ± 1.54	38.84 ± 1.31	<0.001
Mean G.A	27.38±5.5	29.38±2.8	<0.001
Stillbirth	27.9	0.2	1.00



The mean number of cigarettes smoked by the partners of pregnant women was 12.5 ± 7.7 (range from 5 to 40 cigarettes per day). The gestational age, in SHS exposure group, on average was 38.14 weeks (SD = ± 1.55) and in non-SHS exposure group, was 38.85 weeks (SD = ± 1.32). This difference was statistically significant (p- value < 0.001). This means, exposure to cigarette smoke effects on gestational age (Table 1). The mean length of infants, in SHS exposure group was 48.69 ± 1.88 and in non-SHS exposure group, was 49.42 ± 213. This difference was statistically significant (p- value < 0.001). This means, exposure to cigarette smoke effects on baby's length (Table 2).

	Passive smoker	**Non passive smoker**	**P value**
Baby's head circumference(cm)	33.42 ± 1.23	33.88 ± 1.45	<0.001
birth weight (g)	2996.19 ± 354.35	3236.46 ± 413.32	<0.001
Birth length(cm)	45.69 ± 1.88	46.42 ± 2.13	<0.001

DISCUSSION:

The high prevalence of SHS exposure for the non-smoking pregnant women in our provincial study (75%) is consistent with previous literature described 10 years ago in the city of Guangzhou. Although one study in the U.S.A. reported that 16.4% of non-smoking singleton pregnancies had SHS exposure during pregnancy, certain subpopulations even in developed countries like the U.S.A. may have high SHS exposure rates[8]. Among pregnant women in New Haven, Connecticut, U.S.A., 52% of nonsmokers had been classified as having had recent SHS exposure according to their urinary cotinine levels[9]. Another study examined correlates of SHS avoidance in a population of African-American pregnant non-smokers who lived with smokers and reported 73% of the women's salivary cotinine levels exceeded the passive smoking cut-off of 10 ng/ml[10].

The results of our study indicated an adverse effect of SHS exposure on length, weight, baby's head circumference, PROM and pre–mature birth. However, SHS exposure in mothers during pregnancy causes to decrease of birth weight, length, baby's head circumference but, increase the risk of PROM and pre-mature birth[11].

CONCLUSION:

It is concluded that non-smoking pregnant women in Pakistan who lived with a smoking husband were highly exposed to SHS, especially from their husbands. In addition, non-smoking pregnant women have inadequate knowledge on the harms of SHS. These findings are particularly significant for rural women.

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