CODEN [USA]: IAJPBB ISSN : 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
SJIF Impact Factor: 7.187
http://doi.org/10.5281/zenodo.4264718

Avalable online at: http://www.iajps.com *Research Article*

# PASSIVE SMOKING AND NICOTINE LEVELS ON PREGNANCY OUTCOMES AND INFANT HEALTH

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**Article Received:** September 2020 **Accepted:** October 2020 **Published: November** 2020

**Abstract:**
*Preterm birth can be categorized as medically indicated (when pregnancy is interrupted at preterm gestations for maternal or fetal indications) and spontaneous (onset of labor before or after membrane rupture at preterm gestations). The main objective of the study is find the passive smoking and nicotine levels of pregnancy outcomes in Pakistan. This cross sectional study was conducted in Rawalpindi medical College during 2019 to 2020. The data was collected from 100 pregnant females who visited the OPD of hospital. The data was collected through a questionnaire. This questionnaire include the demographic data of all the participants. 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. 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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*Please cite this article in press Nida Khan et al,* ***Passive Smoking And Nicotine Levels On Pregnancy Outcomes And Infant Health.,*** *Indo Am. J. P. Sci, 2020; 07(11).*

## INTRODUCTION:

Preterm birth can be categorized as medically indicated (when pregnancy is interrupted at preterm gestations for maternal or fetal indications) and spontaneous (onset of labor before or after membrane rupture at preterm gestations). More than one-half of PTBs due to medical indications are on the basis of conditions associated with ischemic placental disease including preeclampsia, fetal distress, small-for-gestational-age (SGA) and placental abruption[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]. With the exception of preeclampsia, maternal smoking is associated with each of these etiologies and is a frequent risk factor for PTB. Despite the well known association of maternal smoking with PTB, less is known about the effects of SHS on pregnancy outcomes. To date, few studies have documented adverse on neonatal and pregnancy outcomes in nonsmoking women. Both mainstream and side stream smoke contain thousands of compounds many of them are harmful to humans[6].

### Aims and objective

The main objective of the study is find the passive smoking and nicotine levels of pregnancy outcomes in Pakistan.

## MATERIAL AND METHODS:

This cross-sectional study was conducted in Rawalpindi medical College during 2019 to 2020. The data was collected from 100 pregnant females who visited the OPD of hospital. The data was collected through a questionnaire. This questionnaire include 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 was performed with SPSS 17.0 software (Chicago, IL). Results are reported as median, geometric mean or numbers with percentages.

## 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).

| | 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:

Studies reporting on neonatal outcomes in nonsmoking women have generally used shorter periods of prenatal exposure (1–2 days) or based findings on self-report assessed the effect of prenatal airborne particulate matter ($PM_{2.5}$) exposure in the second trimester on selected birth outcomes (gestational age, weight, length, and head circumference at birth) and found all were negatively affected by the exposure. Three studies further demonstrated the association between domestic prenatal SHS exposure and lowered mean infant birth weights by 36, 79 and 137 grams, respectively. 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].

## 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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