

Effect of paternal tobacco consumption on the newborn

Haleema Hashmi¹, S. Ali Arsalan^{1*}, Aneel Roy¹, Imroz Arif Farhan¹, Sadaf Kanwal¹ and S. Arshad Husain²

¹Departments of Gynaecology and Obstetrics and Pulmonology, Liaquat National Hospital and Medical College, Stadium Road, Karachi, Pakistan

²Department of Pulmonology, NHS Trust Maidstone Hospital, Kent, United Kingdom

Abstract: There has been significant research done on the effects of maternal smoking on pregnancy but not much data is available regarding the role of paternal smoking and its effect on the vitals of a newborn child. We therefore evaluated the effects of paternal tobacco use on new born child. A cross-sectional study was carried out in Department of Gynecology and Obstetrics Liaquat National Hospital and Medical College, Karachi. A questionnaire based interview was conducted in the year 2010 among the delivering females in terms of the pattern of tobacco consumption of their spouse. The neonatal baby's vitals were assessed and previous abortion history was also reviewed in the delivering females. There were n=100 females with mean age 28.34 years±4.095 SD. Tobacco use was found among spouses of n=25 females. Out of them n=14 were smokers and n=11 chewed tobacco. Among females whose husbands smoked (n=14), previous abortion history was found in n=6 (42.85%) females out of which (n=2) females were exposed to tobacco smoke during their present pregnancies. Among the (n=86) females with non smoking husbands, previous abortion was noted in n=19(20.09%). Among females whose husbands chewed tobacco (n=11), previous abortion history was found in (n=3) females. Among (n=2) preterm neonates (n=1) had positive paternal smoking history. Our results suggest that paternal tobacco consumption could increase the risk of complications at birth in the newborn child and abortions in pregnant women. Paternal smoking may also have a biological correlation with such outcomes. Further research and bigger trials are needed to be conducted on this subject.

Keywords: Tobacco smoking, paternal tobacco consumption, neonatal.

Received: September 12, 2012 **Accepted:** January 24, 2013

***Author for Correspondence:** arsalan1957@hotmail.com

INTRODUCTION

The effects of maternal smoking have been studied in great detail. It is well established that maternal smoking and the constituents of tobacco have toxic effects on the ovaries, placenta and uterus¹. Smoking in both active and passive forms is harmful to pregnancy in every trimester. Fetal growth restriction, preterm birth, placental abruption and miscarriages are reported by epidemiological studies². Furthermore, smoking is associated with lower fecundity rates and harmful reproductive results. Not much data is available regarding the contribution of paternal tobacco consumption and its effects on pregnancy and reproductive outcome. This question became the basis of our study and we aimed to find out if paternal tobacco consumption, both as cigarettes and smokeless tobacco, is associated with any pregnancy outcomes.

MATERIALS AND METHODS

This was a cross-sectional study, carried out in the Department of Obstetrics and Gynaecology of Liaquat National Hospital and Medical College, Karachi. Females undergoing delivery in the month of November 2010 were recruited in this study. After having verbal consent from the delivering females, following information was collected in an interviewed questionnaire:

Parity, previous abortion history, co-morbid, tobacco consumption habits in terms of chewing and smoking tobacco of the females and their spouses,

exposure to environmental tobacco smoke during pregnancy by other members of the family other than their spouses.

Neonatal vitals such as APGAR scores, gender, FOC, weight, length and any complication at birth were also recorded.

Statistical analysis was done using SPSS-13 software. Student *t*-test was used for age. Females were divided into two groups, those whose spouses consumed tobacco (either as cigarette smoking or tobacco chewing) and the other in which neither of the couple consumed tobacco.

RESULTS

Mean age of the delivering females was 28.34±4.095 (mean±SD) years. Total 100 females were interviewed who were undergoing delivery. There were 61 male births, 36 female births and 3 intrauterine deaths (IUD). Tobacco use (as cigarette smoking) was found in only 1 female during pregnancy. Tobacco consumption as both cigarette smoking and chewable tobacco was found among spouses of 25 females. Out of them 14 were smokers and 11 chewed tobacco. We found that spouses who used tobacco had a higher history of having spontaneous abortions than those who did not used tobacco. The abortion histories and their relation to paternal tobacco consumption are shown in table 1. Exposure to second hand tobacco smoke from their spouses who smoked cigarette was found in 6 females. We found that among the newborns of these exposed females, 1 was preterm with diminished

reflexes, 1 had respiratory distress and 1 had poor sucking reflex. Exposure to second hand smoke by other members of the family except the spouse was noted in 4 females, out of which 1 had an IUD.

Table 1: Abortion histories of spouses of the male tobacco consuming partners.

Paternal History	Mean Weight (kg)	Mean FOC (cm)	Mean Length (cm)
Smoking (n=11)	3.0091	33.7273	48.3636
Chewable Tobacco (n=11)	2.7545	33.7727	48.7273
Both (n=3)	3.3233	35.3333	49.6667
Mean for Tobacco consumers (n=25)	2.9240	33.940	48.68
None (n=72)	3.0653	34.3403	48.3750

There was no major difference in the height and Fronto Occipital Circumference (FOC) of the neonates of tobacco consumers and non- tobacco consumers as shown in table 2 but we noted that mean weight of neonates whose father consumed tobacco was 0.141Kg lower than the mean weight of non-tobacco consuming fathers' neonates. As depicted in table 2, the weight of the babies whose fathers chewed tobacco was much lower than the babies. We noted at-birth complications in 26 neonates, out of which 7 were associated with paternal tobacco consumption. Neonates with positive paternal tobacco history which was noted in 3 male neonates and 5 female neonates as shown table 3, 7 had an increased respiratory distress at birth along with delayed sucking, delayed micturation reflexes. During pregnancy 5 females had placental problems, 3 had placenta previa and all their spouses smoked cigarettes and 2 were exposed to passive smoke. Abruptio placenta was found in 2 females; out of which 1 had her spouse chewing tobacco and 1 was exposed to second hand smoke from the other members of the family.

DISCUSSION

It is well accepted that maternal smoking and tobacco consumption poses high risk to the fetus and the neonates. A study performed by Salihu et al. in 2003, showed that the infant mortality rate was 40% higher in the females who smoked during pregnancy as compared to non-smoking gravidas³. Maternal smoking has been shown to cause an increased risk of malformations such as microcephalus, cleft defects and clubfoot⁴, increase

in spontaneous abortions and preterm deliveries and reduction in birth weight^{5,6}. Impact of paternal tobacco use on neonates has not been studied in much detail as compared to studies done on maternal smoking.

Table 2: Anthropometric measures of the neonates of the tobacco consuming fathers.

	Cigarette Smoking (n=11)	Chewable Tobacco (n=11)	Both (n=3)	No Tobacco (n=75)
Single Abortion	n=4 (36.36%)	n=2 (18.18%)	n=1 (33.33%)	n=12 (16%)
Multiple Abortion	n=0 (%)	n=1 (9.09%)	n=1 (33.33%)	n=3 (4%)
Total	n=4 (36.36%)	n=3 (27.27%)	n=2 (66.67%)	n=15 (20%)

Table 3: Complications occurring at birth to neonates of tobacco consuming fathers.

At Birth Complication	Total (n=100)	Cigarettes Smokers (n=14)	Tobacco Chewers (n=11)
Respiratory distress	n=7	n=2	n=1
Delayed sucking	n=2	n=1	
Delayed micturation	n=2		n=1
Meconium aspiration	n=2		n=1
Tachypnea + tachycardia	n=4		n=1
Preterm	n=2		n=1
IUD	n=3		
Diminished reflexes	n=1		
Erythema toxicum	n=1		
Hydronephrosis	n=1		
IUGR	n=1		

According to a review by Wigle et al., prenatal exposure to environmental tobacco smoke delays conception. But the evidences in support of this statement are still inadequate and no consistency has been found in the fecundability and male partner smoking. According to this review there is limited evidence that ETS causes spontaneous abortions but sufficient evidence is available to support that ETS causes preterm births⁷. A study showed that paternal smoking was not associated with increased risk for small for age gestational babies⁸. Our study shows that the child born to the smoking spouses of non-smoking females had higher histories of spontaneous abortions than those of either non-smoking parents. Our study reflects that the use of chewable tobacco by male partner was associated with increased risk for spontaneous abortions compared with non-tobacco consumers. A casual association between paternal smoking and spontaneous abortions has been reviewed by an expert panel. They noted that this relationship between paternal smoking and spontaneous abortions may result from paternal germ-cell mutations before pregnancy rather than

REFERENCES

maternal ETS exposure after conception⁹. Our study also reflects that neonates born to tobacco consuming fathers had higher incidence of complications at birth along with slightly low birth weight than babies of non-smoking fathers. Respiratory distress was found more common in babies of tobacco consuming fathers. Women who smoked during pregnancy have a 2.6-4.4 fold higher risk of placenta praevia than non-smokers¹⁰. It has been recognized that women who smoke during pregnancy give birth to a high proportion of neonates with low birth weight (LBW) or growth retardation, sometimes with shortened pregnancies (preterm deliveries), and/or are more likely, than non-smoking pregnant women, to miscarry due to premature placental abruption¹¹. There may be a correlation of tobacco consumption by the male partner and exposure to second-hand smoke if he is cigarette smoker and placental problems of the delivering females.

CONCLUSION

This study suggests that paternal tobacco use in the form of smoking or tobacco without cigarettes in a chewable form may have some relation with the antenatal complications and previous abortions. Further studies in the form of bigger cohort trails on tobacco usage in any form as cigarettes or smokeless tobacco by the father and its effects on pregnancy and antenatal complications should be evaluated.

1. Shiverick KT and Salafia C Cigarette smoking and pregnancy I: ovarian, uterine and placental effects. *Placenta*, 1999; 20: 265-272.
2. Dechanet C, Anahory T, Mathieu Daude JC, Quantin X and Reyftmann L. Effects of cigarette smoking on reproduction. *Hum. Reprod. Update*, 2011; 17: 76-95.
3. Salihu HM, Aliyu MH, Pierre-Louis BJ and Alexander GR. Levels of excess infant deaths attributable to maternal smoking during pregnancy in the United States. *Matern. Child Health J.*, 2003; 7: 219-227.
4. Van den Eeden SK, Karagas MR, Daling JR and Vaughan TL. A case-control study of maternal smoking and congenital malformations. *Paediatr. Perinat. Epidemiol.*, 1990; 4: 147-155.
5. Himmelberger DU, Brown BW Jr and Cohen EN. Cigarette smoking during pregnancy and the occurrence of spontaneous abortion and congenital abnormality. *Am. J. Epidemiol.*, 1978; 108: 470-479.
6. Shah NR and Bracken MB. A systematic review and meta-analysis of prospective studies on the association between maternal cigarette smoking and preterm delivery. *Am. J. Obstet. Gynecol.*, 2000; 182: 465-472.
7. Wigle DT, Arbuckle TE, Turner MC, Bérubé A, Yang Q, Liu S and Krewski D. Epidemiologic Evidence of Relationships Between Reproductive and Child Health Outcomes and Environmental Chemical Contaminants. *J. Toxicol. Environ. Health*, 2008; 11: 373-517.
8. Mitchell EA, Thompson JMD, Robinson E, Wild CJ, Becroft DMO, Clark PM. Smoking, nicotine and tar and risk of small for gestational age babies. *Acta. Paediatr.*, 2002; 91: 323-328.
9. Chelmow D, Andrew DE and Baker ER. Maternal cigarette smoking and placenta previa. *Obstet. Gynecol.*, 1996; 87: 703-707
10. Cnattingius S and Nordstrom ML. Maternal smoking and foeto-infant mortality: biological pathways and public health significance. *Acta Paediatr.*, 1996; 85: 1400-1402.