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Effect of Maternal Smokeless Tobacco use during Pregnancy on Neonatal Outcome- A Hospital-Based Study

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Abstract **Original Research Article**

Introduction: Outcomes that are related to maternal smokeless tobacco (ST) were considerably assessed over the past 50 years with resultant health issues. About 28% of Bengali women have been seen using ST. Some significant health consequences of smoking during pregnancy as, continuous abortion, stillbirth, preterm delivery, preeclampsia, low birth weight babies, and intrauterine growth retardation. ***Aim of the study:*** To investigate the influence of use ST during pregnancy on aspects of neonatal outcome like LBW & preterm birth. ***Methods:*** A comparative cross sectional study, conducted in the Department of Paediatrics and Department of Gynecology & Obstetrics, Dhaka Medical College Hospital, Dhaka from January 2009 to December 2010. A total of 340 mother-neonate pairs were included in the study and among them,170 mothers using ST for years and heir recently delivered newborn infants (mother-neonate pairs) were enrolled as 'cases' by purposive sampling, and another 170 mother-newborn pairs matched with histories of not using smokeless tobacco or smoke were enrolled as controls. Detailed history of each mother about the antenatal period was taken and through physical examination of the mother was done immediately. Each neoborn was assessed for birth weight and gestational age. Birth weight was weighted in gram using baby scale. Gestional age was determined by LRMP method and also by New Ballard Scoring System. ***Result:*** Most of the mothers in this study used shada, followed by jorda, shada+jorda and gul. Smokeless tobacco (ST) used by mothers during pregnancy had a significant association with the delivery of LBW baby (P <0.001) and carries a risk of having delivery of LBW baby 3.7 times higher compared to nonusers of smokeless tobacco. Preterm delivery(P <0.001)was significantly associated with use of smokeless tobacco by mothers in the study group in comparison to the control group and carries a risk of having preterm delivery 3.1 times more than nonusers. ***Conclusion:*** To conclude the effect of maternal ST is considerably associated with LBW baby and preterm birth.

Keywords: Smokeless Tobacco, LBW, Preterm birth etc.

INTRODUCTION

Tobacco of any form is adequate to circulate diseases around the world. Maternal smokeless (ST) use and maternal denunciation to ignited tobacco vapors are recently acknowledged as leading resilient risks associated with detrimental maternal consequences [1]. Smoking is substantially reduced among women compared to men. However, more than 200 million women normalize smoking globally. In Southeast Asia, smoking among women may be occasional, however, the use of smokeless tobacco is very common [2]. In India, 57.5% currently used tobacco, 99.6% of which was smokeless [3].Generally, in both developed and developing countries more than 22% and 9% of women use ST respectively [4]. Tobacco is available in the market in the form of cigarettes, bidis, sticks, pipe, paan, snuff, mishri, etc. Paan is the most common chewing habit, especially for Bengali women. It is one of the frequent ways of ST use in Bangladesh [5]. In developed countries, one in every five children is born underweight to mothers who smoke or use ST during

maternity. Pregnancy is a piercing concern for mother to fetal evaluation. Both maternal and physical elements play a key role which can lead sometimes to antagonistic pregnancy consequences [6]. Ectopic pregnancy, underweight infants, IUGR babies, endless abortion, preterm babies are the outcomes of detrimental effects [7]. Spontaneous abortion is the loss of pregnancy naturally before twenty weeks of gestation which is referred to as a 'miscarriage' to avoid association with induced abortion [8]. Premature birth is a significant universal problem and the leading cause of newborn deaths. Tobacco smoking has been associated with premature birth for over 50 years [9]. Fifteen million babies are born early around the world. Preterm baby means a live-born infant delivered before 37 completed weeks of gestation from beginning to last menstruation defined by WHO [10]. Some cohort studies have focused on preterm births; however, awareness of the potential results and prognosis of all preterm babies is an essential step for health professionals caring for these children. Huge disparities exist between high- and low-income countries, but also among high-income countries themselves [11].The hindrance of LBW is a crucial public health and clinical distress mostly in developing countries. Babies with a birth weight less than 2500 gram, irrespective of gestation are termed as LBW baby[12] .The neonatal mortality among LBW infants is 133 deaths per thousand. Babies born with underweight have higher mortality rates and are at greater risk of growth retardation, poor cognitive development, increased morbidity, and impaired immunity in the long run [13]. Now a days tobacco is one of the prime concerns of death both nationally and internationally and causes significant inimical influences on maternal and child health. The study intended to determine the effects of smokeless tobacco during pregnancy on neonatal outcomes like LBW and preterm birth.

METHODS

This is a comparative cross sectional study that was carried out in the Department of Paediatrics and Department of Gynecology and obstetrics, Dhaka Medical College Hospital, Dhaka. A total of 340 mother-neonate pairs were included in the study and among them, 170 mothers using ST during pregnancy and heir recently delivered newborn infants (mother-neonate pairs) were enrolled as 'cases' by purposive sampling, and another 170 mother-newborn pairs matched with age, socio-economic status, BMI, paternal smoking, educational status with histories of not using smokeless tobacco or smoke were enrolled as controls. Ethical consent was taken from the Ethical Committee of Dhaka Medical college and hospital, Dhaka. The information was kept confidential only to be used for the study purpose.

Inclusion criteria

- Mothers using smokeless tobacco during this pregnancy and had delivered recently a newborn infant.
- The age of the mother was between 20-40 years.
- BMI and hemoglobin level of the mother was more than 18.5 and 10gm/dl accordingly.
- The infant's age was less than 24 hours

Exclusion criteria

- Multiple gestations
- Both smoker and alcoholic mother
- Mothers having hypertention, pre-eclampsia, diabetes mellitus & chronic renal disease.

Control

The neonates whose age was not more than 24 hours and mothers who neither smoked nor took ST were selected as controls.

Matching

Matching was assessed regarding

- Age and sex of the baby
- BMI of mothers
- Maternal age
- Socioeconomic status
- Passive smoking
- Hb level of mother
- Educational status

Evaluation

Specified records of mothers were taken which included age, educational level, socioeconomic status, smoking status, paternal smoking status, frequency of taking ST. Mothers were asked about the signs of eclampsia or preeclampsia. Mothers' physical examinations were done entirely which included height, weight, BMI, blood pressure, signs of any systematic disease, or any infection, hypertension. Estimation of Hb, blood urea, serum creatinine, the blood sugar of each mother was done. The neonatal was assessed for birth weight, OFC, supine length, any stigmata of chromosomal disorders, and signs for congenital infection. Karyotyping and screening were done when required. The baby's supine length was taken in centimeters by infantometer. The babies were weighed in grams using the baby scale. OFC was calculated in centimeters by using a measuring tape. The gestational age of the newborn was examined by LRMP and New Ballard Scoring System. In case of any discrepancy of more than two weeks, the latter was accepted.

RESULTS

Table-I depicts that the maternal mean age of patients was 27.64 ±4.6 who were recruited as cases. The mean BMI and the Hb status of the patients enrolled as cases were 20.23±0.8 and 10.99±0.3 respectively. More than half of the study population

(52.94%) studied at the secondary level, around one-fifth (35,20.59%) of patients were illiterate and completed primary schooling respectively enrolled as cases. About three-forth (116,68.24%) of the study population were poor who enrolled as cases. Passive smoking was found in about 70% (118,69.41%) of the study population (case). The mean age in hours of the neonate was 12.0±SD and most of the neonates recruited as cases were female (55%). In the case of controls, the maternal mean age of patients was 26.99±4.78.The mean BMI and the Hb status of the patients enrolled as control were 20.09±0.8 and 10.90±0.3 respectively. Half (85,50%) of the study population (controls) completed secondary level of education, about one-fifth (40,23.53%) of them were illiterate. More than half of the study population (65.29%) were poor and passive smoking was found in about 66.47% of patients who were enrolled as controls. The mean age in hours of neonatal was 11.6±SD. Most of the neonates enrolled as controls were female(54%). Most of the mothers used shada 105(70%) followed by jorda 30 (20%), shada+jorda 10(7%) &gul 5(3%) [Fig:1]. Table-II shows that maximum mothers (62.6%) used ST 5-10 times per day with a minimum once and maximum of 15 times per day. Table-III shows the frequency of LBW delivery among ST users was 58.2% (100) and among non-ST users was 27.7% (47) and the odds ratio was 3.7. The use of ST during pregnancy is significantly associated with the delivery of LBW infants (P<0.001) & carries a risk of having delivery of LBW baby 3.7 times higher than that of non-ST users. Table-IV explains the frequency of preterm delivery among ST users was 38.2% (65) and among non-ST users was 16.5% (28) and the odds ratio was 3.1. The use of ST during pregnancy is significantly associated with preterm delivery (P<0.001) & carries a risk of having a preterm delivery 3.1times more than non-ST users.

Table-I:Baseline characteristics of the cases N=170 and controls N=170.

	Characteristics	**Cases N=170**	**Controls N=170**	**p-value**
Maternal	1.Total number	170	170	
	2.Age in years(Mean±SD)	27.64 ±4.62	26.99±4.78	>.10 *
	3.BMI(Mean±SD)	20.23±0.8	20.09±0.8	>.10 *
	4.Hb status in gm/dl(Mean±SD)	10.99±0.3	10.90±.0.3	>.10 *
	5. Educational status Illiterate Class1-V Class VI-X SSC and above	 35(20.59%) 35(20.59%) 90(52.94%) 10(5.88%)	 40(23.53%) 30(17.65%) 85(50%) 15(8.82%)	 >.50 # >.10 # >.50 # >.10 #
	6.Socio-economic status Poor Middle class	 116(68.24%) 54(31.76%)	 111(65.29%) 59(34.71%)	 >.50 # >.50 #
	7. Husbands smoking Yes No	 118(69.41%) 52(30.59%)	 113(66.47%) 57(33.53%)	 >.50 #
Neonatal	Age in hours	12.0±SD	11.6±SD	>.50 #
	Sex Male Female	 77(45.0%) 93(55.0%)	 78(46.0%) 92(54%)	 >.50 #

* = by Z test

#= by λ^2 test

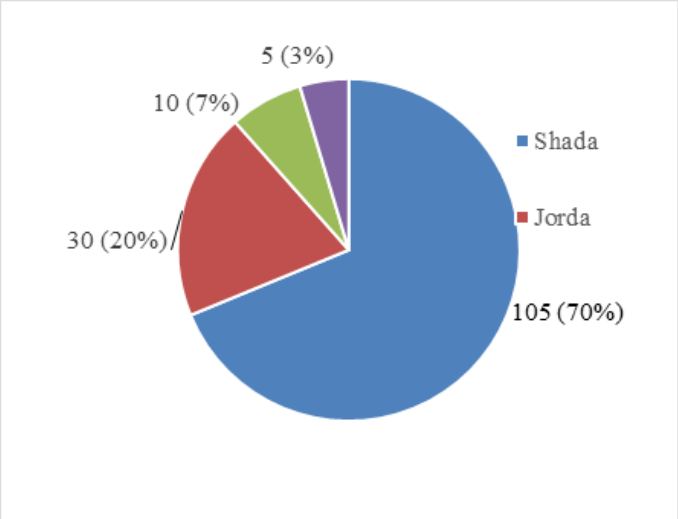

Fig 1: Types of smokeless tobacco (ST) used by mothers

Table-II: Frequency of Smokeless Tobacco use by Mothers During Pregnancy (Cases, N=170)

Times per Day	N, %	Mean (±SD)
<5	59, 34.5%	5.74±2.8
5-10	107,62.6%	
>10	5,2.9%	

Table-III: Frequency of LBW Delivery in women and Who Did Not Use Smokeless Tobacco During Pregnancy (Cases, N=170, Controls, N=170).

Characteristics	Yes (N, %)	No (N, %)	p-value	Odds Ratio
ST Users	100, 58.2%	70, 41.8%	<0.001	3.7
Non-ST Users	47, 27.7%	123, 72.3%		

Table-IV: Frequency of Preterm Delivery in women and Who Did Not Use Smokeless Tobacco During Pregnancy (Cases, N=170, Controls, N=170)

Characteristics	Yes (N, %)	No (N, %)	p-value	Odds Ratio
ST Users	65, 38.2%	105, 61.8%	<0.001	3.1
Non-ST Users	28, 16.5%	142, 83.5%		

DISCUSSION

All forms of tobacco are harmful, and there is no safe level of exposure to tobacco. Maternal smoking refers to the adverse behavior of women who tend to smoke or use smokeless tobacco before or during the gestational period. The purpose of the study was to determine the effect of maternal smokeless tobacco use during pregnancy on neonatal outcomes. This present comparative cross sectional study revealed that among newborn ST user mothers 58.2% were LBW infants and 38.2% were preterm babies. In contrast with non-ST user mothers, the percentage of LBW babies and preterm babies and was 27.7% and 16.5% respectively. In Pakistan, the author found almost similar results [14]. Another case control study conducted in Bangladesh showed that maternal smokeless tobacco (ST) use during pregnancy was significantly associated (46%) with the delivery of preterm babies ($p<0.001$) and carries a risk of 2.7 times than that of non ST users[15]. In this present study, the author described a lesser proportion of preterm babies among the control group and a higher proportion of LBW infants in study groups. In this current analysis, for refreshment most of the mothers used shada, jorda, shada+jorda, gul during pregnancy and the percentage is about 70%, 20%, 7% and 3%. Similar findings were conducted in Mumbai [3]. Women in Bangladesh are deprived of sorts of recreation, so they start this sort of chewing habit to divert their monotony. Mothers took ST initially as an element of recreation as there is lacking enough scope of recreation in our society for women and ended up continuing it for years [5]. A similar study conducted in Europe and North America found most of the women especially during pregnancy chew tobacco or snuff to divert their mood [16]. Analyses conducted in India also revealed the same sorts of ways of ST consumption among mothers of LBW babies [3]. In this study, the author found that mothers used ST for one year. Smoking can alone be responsible for having 20-30% of low birth weight babies [17]. More analyses done in middle-income countries and India support the recent outcomes [18, 19]. But, developed countries had a very low incidence of LBW babies, for example, Thailand

9%, East Asia and Pacific 8% Sub-Saharan Africa 14%, Latin America 10%, US 8%, Russia 6%, globally 16% [20]. This study established that the potentiality of delivery of LBW baby among the non-ST mothers was 3.7 times lower than ST users group. The association between the use of ST during pregnancy and the delivery of LBW infants is extremely significant ($p<0.001$). In India, the author found almost alike outcomes such as 1.6 times more risk of LBW for women who used ST compared to the non-ST user [21]. Maternal mishri use was allied with a 3.2 times higher risk of having LBW infants [20]. Analysis which was carried out in Bangladesh demonstrated that there were 4.1 times and 2.2 times more risk of LBW for women who were used ST than non-ST users [22, 23]. Tobacco smoking during pregnancy abridges the gestational period and increases the number of early deliveries. This study showed that the risk of preterm deliveries among ST user mothers is 3.1 times higher than the non-ST user. A prospective cohort study directed in India found that 0.19 million preterm births occurring annually in India could be attributed to maternal SLT use.[24]. A prospective cohort study directed in India found 1.4 times the risk of preterm deliveries for women who use ST than non-users [3]. Another study carried out in Bangladesh found that mothers who use ST during pregnancy carry a huge risk of having preterm deliveries 4.6 times higher in contrast with the non-ST user [25].

Limitations

Some limitations include:

- Some mothers were confused about the frequency and duration of chewing tobacco use.
- Poor sample size.

CONCLUSION

Exposure to combusted tobacco in pregnancy has long been addressed as a contributing element in adverse maternal outcomes. Smokeless tobacco is often inexpensive and easily attainable to women around the world. Simultaneously use of smokeless tobacco during pregnancy significantly associated with LBW and preterm baby. Special attention should be prioritized to avert or at least diminish the use of ST during pregnancy as a part of routine antenatal care.

RECOMMENDATIONS

Some recommendations may need in this study. That includes

- Women during pregnancy should not use smokeless tobacco.
- Steps should be undertaken to demand public awareness about untowarded effects of smokeless tobacco through mass and social media.

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