

Original Articles

Role of Maternal Smokeless Tobacco Ingestion During Pregnancy in Delivery of Preterm Babies

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Abstract

Background: Smokeless tobacco is an established cause of adverse pregnancy outcome. Preterm deliveries are quite high (14%) in our country and approximately 39% women in Bangladesh use smokeless tobacco (ST).

Objective: To determine the outcome of maternal smokeless tobacco ingestion during pregnancy in delivery of preterm babies.

Methods: A retrospective case control study was carried out in the department of Pediatrics & department of Obstetrics and Gynecology in Dhaka Medical College Hospital between July 2010 to June 2011. Immediately after admission, detailed history of the newborn baby & mother was taken. A total of 100 cases (preterm babies) and 100 suitably matched controls (sick term neonates) were enrolled. Every case satisfying the selection criteria (inclusion & exclusion criteria) was enrolled in the study. The mother was asked whether she used to use smokeless tobacco (jorda, shada or gul) during pregnancy and about frequency and duration of ingestion of ST.

Results: Baseline characteristics of cases and controls were comparable. ST user mothers of preterm babies used ST about 5 times a day. 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.

Conclusion: Maternal ST use ≥ 5 times a day during pregnancy increases 2.7 folds risk of delivery of preterm babies than that of non-ingested.

Key words: Smokeless tobacco, Pregnancy, Preterm Babies.

Introduction

Low birth weight and preterm birth are powerful determinants of morbidity and mortality in newborn babies and infants. In Bangladesh preterm birth is approximately 14%.¹ 15.4% of global under five deaths are associated with prematurity.² In Bangladesh 7% of under five deaths is caused by prematurity.³

The etiology of prematurity is multifactorial and involves a complex interaction between fetal, placental, uterine and maternal factors. The common reasons of preterm birth in developing countries include: genital tract infection, multiple gestation, pregnancy induced hypertension, teenage mother, incompetent cervix, previous preterm labour, abruption placenta, heavy work and smoking.⁴

In Bangladesh, commonly used smokeless tobaccos are :shada, jorda and gul. These are taken usually with betel quid, areca nut and lime and use of smokeless tobacco mixed with areca nut is very popular here.⁵ In Bangladesh, smoking prevalence is 50% among men and 3% among women where as 22% of men and 39% of women use smokeless

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tobacco in chewing form.⁶ One study conducted by locally showed that prevalence of chewing tobacco in females was 21.6% and in males 19.4%.⁷

ST users are exposed to higher continuous level of nicotine and carcinogen than smoker. Total number of nicotine absorbed from a one unit dose of ST ingestion is several fold (4.5 mg) higher than that of cigarette (1 mg) and blood nicotine levels are achieved rapidly with ST ingestion within 30 minutes.⁸ In the duration of half hour chew, the average smokeless tobacco user ingests an amount in 4 cigarettes. It would take nearly 60 cigarettes to equal the amount of nicotine in a single cane of chewing.⁹

ST is as harmful as tobacco smoking though many people believe wrongly that ST is a safe alternative to smoking. In Bangladesh prevalence of preterm delivery is high & is major cause of under five mortality. A lot of studies have been done to see the effect of tobacco smoking on pregnancy outcome. But studies on the effect of ST on pregnancy is scanty specially in Bangladesh.

The aim of our study is to determine the effect of duration & frequency of ST ingestion of mothers during pregnancy in delivery of preterm babies.

Materials and Methods

This retrospective case control study was carried out in the Department of Pediatrics and Department of Obstetrics & Gynecology, DMCH between July 2010 to June 2011. Total 100 cases and 100 suitably matched controls were included in this study. Immediately after admission, detailed history of the newborn baby (aged 24 hours or less) and mother was taken; each baby was weighed in gram using NNC bar scale; and thorough physical examination was done. Gestational age was determined from the 1st day of the last menstruation (when available) and also by using "New Ballard Scoring system". In case of any discrepancy of more than 2 weeks, the later was accepted. When any preterm baby was found admitted, detailed history; with special emphasis on hypertension, renal disease, radiation exposure during pregnancy, features of toxemia, alcohol consumption and whether any family member smokes; were taken. The mother was asked whether she used to use smokeless tobacco (jorda, shada or gul) during pregnancy. If she was found to be a ST user, asked about frequency and duration of ingestion of smokeless tobacco. Inclusion criteria were: 1) Preterm baby having gestational age less than 37 completed weeks; 2) Age of baby less than or equal to 24 hours; 3) BMI of mother more than 17; 4) Mothers age between 20-35

years & 5) Hemoglobin level of mother more than 10 gm/dl. Exclusion criteria were 1) Term IUGR baby; 2) Baby of mother having hypertension, diabetes mellitus, pre-eclampsia, eclampsia and chronic renal diseases; 3) multiple gestations; 4) baby of smoker parents & other closed family members and 5) peri-natal infection eg. TORCH infection. Every case satisfying the selection criteria were enrolled in the study. Sick non-IUGR term infants (perinatal asphyxia, birth trauma, neonatal jaundice etc.) admitted in the pediatric wards were included as control for comparing effect of ST in preterm and term babies.

Data were processed and analyzed using computer software. Exposure rate was calculated, significance of difference was calculated using chi-square (χ^2) test. Ethical issues were addressed duly.

Results

Baseline characteristics regarding age, BMI, Hb level of mother of cases & controls were almost similar (Table-I).

Table-I
Baseline characteristics

Baseline characteristics	Cases Mean (\pm SD)	Controls Mean(\pm SD)
Age of neonate(Hours)	12.15(\pm 7.09)	12.01(\pm 8.66)
Weight of neonate (in gm.)	1635.8 (\pm 409.17)	2792.1 (\pm 485.79)
Gestational age by history(in weeks)	31.79(\pm 2.41)	39.02(\pm 0.88)
Gestational age by new ballard scoring system in weeks	32.02(\pm 2.25)	39.16(\pm .86)
Age of the mother	27.91(\pm 4.43)	26.08(\pm 4.17)
BMI of the mother	20.81(\pm 1.83)	20.46(\pm 1.01)
Hb level of mother (gm/dl)	10.97(\pm .35)	11.03(\pm .51)

About 52% mothers used to take jorda, gul and shada was ingested by 28% and 20% respectively (Fig.-1)

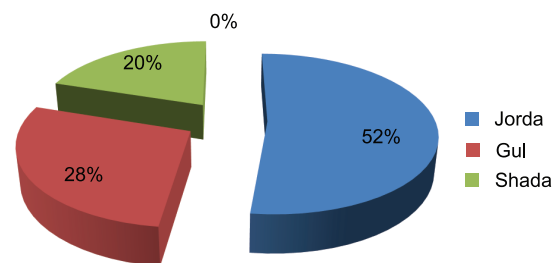


Fig.-1 Types of smokeless tobacco used by mothers (n- 70)

Table-II

Number of mothers used to take ST ≥5 year in study & control group

	No. of mothers	Percent(%)	P Value
Cases	4	73%	<0.01
Controls	6	25%	

About 73% of cases used to take ST >5 years as compared to 25% of mothers in the control group (p <0.01)

Table-III

ST taken ≥ 5 times/day during pregnancy

Frequency of ST (per day)	Case	Control	P value
<5 times/day	22 (48%)	23 (96%)	<0.01
≥5 times/day	24 (52%)	1 (4%)	

Table-IV

Effect of antepartum smokeless tobacco ingestion in the delivery of preterm baby

	Case	Control	Total	Odd Ratio
Smokeless tobacco ingestion present	46	24	70	2.69
Smokeless tobacco ingestion absent	54	76	130	
Total	100	100	200	

Effect of smokeless tobacco ingestion during pregnancy is significantly associated with the development of preterm babies (p<0.01) and the calculated value of odds ratio is= 2.69.

Smokeless tobacco ingestion carries a risk of having preterm babies about more than 2.69 times than those who are not habituated to ST ingestion.

Discussion

Over 80% of all the cases of neonatal deaths, in both the developed and developing countries, occur among the LBW babies. One third of the LBW babies are preterm, they are the major determinants of malnutrition during infancy because over 40% of the LBW babies are malnourished at one year of age.

In Bangladesh, one of the most socially accepted health-damaging behavior is tobacco use, mainly

cigarette smoking and smokeless tobacco ingestion. The prevalence of adult smoking in Bangladesh fell from 34.6% to 20% between 2000 and 2013. More than a quarter of the adult population use ST.¹⁰ Among females, the prevalence of ST use in Bangladesh is 27.9%.¹¹

In this study we found about 46% of the mothers of preterm babies were ST Gul and 21.73% users & majority of the ST users used Jarda. The study found that about 52.17% of mothers used Jarda, 26% used Gul and 21.73% used Shada.

To know about the habit of using smokeless tobacco among the mothers of the neonate's, it was found that out of 200 members of the study; only 35% patients had a habit of using ST from both of the group. Besides, 65% of the member did not have any habit of using ST. 24% mothers from the control group had a habit of using ST, 46% mothers were used to take ST from the case group. To illustrate about the generally used tobacco types, it was found that 24 (almost 50%) respondents generally used Jarda as their ST intake habit. To illustrate the frequency of taking ST among the users (mother of the neonate's) it was found that, the frequency of taking ST ranges 2 to 6 times. Besides, while answering the question that, how long did the mother of the neonate's continued taking ST (years-anti partum), it was found that, from the case group, most of the respondents were found of taking ST for 6-8 years. But from control groups, it was about 2-3 years.

The reasons for taking jarda by majority of mothers were that it was easily available, sweetened and they thought it as less harmful. Emesis is an unwanted consequences of early pregnancy; to combat this mother used to take ST with paan which could not be avoided later.

In the present, we found that the effects of ST ingestion during pregnancy is significantly associated with the delivery of preterm babies (p<0.01). Smokeless tobacco ingestion carries a risk of having preterm babies about more than 2.69 times than those who are not habituated to ST ingestion.

Previously several studies were conducted locally by Rahman ME et al¹², and Rahman ME et al¹³ found almost 60% of ST ingestion among mothers of IUGR babies. A retrospective cohort study was carried out in Sylhet, Bangladesh showed preterm delivery was

higher in ST user group (odd ratio 3:1 and $p < 0.01$) than non ST user.¹⁴

Conclusion

Maternal smokeless tobacco ingestion e" 5times/day is significantly associated with delivery of preterm babies. Ingestion of ST by mother carries a risk of having preterm babies 2.7 times more than that of not ingested.

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