

## Adverse Effects of Tobacco on Pregnancy Outcome

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### Introduction

Tobacco, Nicotianatabacum of solanaceae family, was originally cultivated in North America, thousands of years ago and smoked by indigenous Americans at least 2000 years ago, spreaded throughout the world after the arrival of the European settlers.<sup>1</sup> Tobacco is being used in various forms, predominantly as smoking and smokeless tobacco (ST). About one third of the adults in the world including increasing number of women (250 million) daily smokes (22% in developed world & 9% of women in developing world.<sup>2</sup> In Bangladesh smoking prevalence is 45% among men and 1.5% among women where 26% of men and 28% of women use smokeless tobacco in chewing form.<sup>3,4</sup> Smoking is an established cause of adverse pregnancy outcome. Smoking is associated with higher rates of abortion, ectopic pregnancy, stillbirth, placenta previa, abruptio placentae, premature rupture of the membranes, preterm birth, intrauterine growth retardation and sudden infant death syndrome (SIDS).<sup>5,6</sup>

Smoking during pregnancy can lead to a plethora of health risks to both the mother and the fetus. Women who smoke during pregnancy are about twice as likely to experience the following additional pregnancy complications<sup>7</sup>: premature rupture of membranes, placental abruption, placenta previa, premature birth, sudden infant death syndrome (SIDS); birth defects associated with smoking during Pregnancy are heart defects (odds ratio 1.09), musculoskeletal defect (odds ratio 1.16), clubfoot (odds ratio 1.28), eye defects (odds ratio 1.25), orofacial defects (odds ratio 1.28), anal atresia (odds ratio 1.20), hernia (odds ratio 1.40). Smoking can also cause other birth defects e.g. reduced birth circumference, altered brainstem development, altered lung structure, and cerebral palsy.<sup>8</sup>

Tobacco contains thousands of compounds that may have adverse effects on the human body. Nicotine is

the major compounds of significance. Nicotine is metabolized to many different compounds, the most notable being cotinine. Nicotine and its active metabolite cotinine increases maternal blood pressure and heart rate. Fetal heart rate is also increased. There is concomitant reduction in the blood flow of uterine artery and umbilical artery.<sup>9, 10</sup> Nicotine also impairs placental transfer of amino acids and affects fetal brain development which may cause fetal hypoxia and growth retardation.<sup>11,12</sup> ST users are exposed to higher level of nicotine than smokers. The systemic absorption of nicotine per dose is greater with use of chewing tobacco (average 4.5 mg from average dose of 7.9 g chewed over 30 minutes) compared with that from smoking cigarettes (average 1mg per cigarette).<sup>13</sup> Nicotine of ST may cause same adverse pregnancy outcome as smoking.

Tobacco is an important public health issue and a number of studies had been carried out focusing adverse effects of tobacco on pregnancy outcome. The most recognized effect of maternal smoking is the increased risk LBW baby. In addition to preterm delivery tobacco, both in smoking and smokeless form, is associated with intrauterine growth retardation (IUGR). Deshmukh JS *et al* 14 studied the prevalence of LBW and its association with maternal factors in India. They found tobacco exposure (both smoking and smokeless tobacco) was significantly associated with LBW baby (odd ratio 3.14). Rahman ME *et al* 15 conducted a case-control in Bangladesh to see the role of maternal tobacco use during pregnancy in the development of IUGR infants. A total of 75 cases and 150 controls were studied. Maternal smokeless tobacco use during pregnancy was associated (71.9% & 28.5%) with the development of IUGR infants ( $p < 0.001$ ) and carried a risk of having IUGR infants 6.4 times that non-tobacco users. A prospective cohort study

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done in Mumbai, India by Gupta PC<sup>et al</sup><sup>16</sup> showed that there was 1.6 times more risk of LBW for women who used ST than non-users.

Tobacco is a preventable cause of adverse pregnancy outcome. Intervention to quit tobacco includes behavior therapy and pharmacotherapy; the only drug readily available for quitting tobacco use is nicotine replacement therapy. Nic VAX<sup>17</sup> is a nicotine conjugate vaccine intended to reduce or eliminate physical addiction to nicotine. Smoking & Tobacco product usage Act should be followed up strictly, in that situation, rate of smoking can be curbed in Bangladesh.

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