

Consequences of Maternal Smoking During Pregnancy on Maternal and Fetal Outcomes

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Abstract

Pregnancy is one of the most beautiful gifts of the God. According to The World Health Organization, prevalence of smoking among women in developed countries is comparatively higher than underdeveloped countries. The level of nicotine and thiocyanate in the blood of pregnant women is 20%–30%. Smoking during pregnancy, affects maternal and fetal health. It affects the fertility, perinatal mortality and increased risk of spontaneous abortion among women while, low birth weight and preterm birth among infants. In addition, it is also associated with increased risks of ectopic pregnancies, placenta praevia, pre-eclampsia, and reduced foetal outcomes including mortality, low birth weight, and sudden infant death syndrome. Moreover, small for gestational age (SGA), shorter length and smaller head circumference at birth are reported among infants as an outcome of maternal smoking. Educational interventions regarding anti-tobacco campaigns and quit-smoking initiatives should be planned and implemented for pregnant women. There is need of sensitization regarding cessation of smoking among pregnant women.

Keywords: Pregnancy; Smoking; Maternal; Fetal outcomes; Consequences

Introduction

In the world, India is the second-largest consumer of tobacco while third-largest tobacco producer.¹ According to The World Health Organization, the prevalence of smoking among women in developed countries and underdeveloped countries are 22% and 9% respectively.² At the global level, western countries like as France, Scotland, Wales, Northern Ireland and Spain have high prevalence

rate of smoking during pregnancy. However, the estimation of prevalence of smoking during pregnancy is difficult because of many nations have limited data regarding smoking status.³ The level of nicotine and thiocyanate in the blood of pregnant women is 20%–30%.⁴ Maternal and fetal health is important for every nation. Complications during pregnancy lead to morbid and fatal conditions to pregnant woman and her fetus.⁵ Vikram K et al revealed that maternal education had significant

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association with medical care, immunization, iron supplementation among pregnant mothers. In addition, the study reported that maternal education impacts child health and medical care outcomes.⁶ Placenta concentrated the level of placenta and it's reabsorbed from amniotic fluid through the fetus's skin and gastrointestinal tract. Vasoconstriction effects are observed on umbilical and uterine arteries.¹ The study stated that abnormal development of placental vascularization prone to placental insufficiency, which minimizes the exchange between maternal circulation and fetal circulation. In smoker pregnant women, fetal capillaries in villi were in smaller size.⁷ Level of nicotine in the fetal circulation is 15% more than the maternal circulation. In a systematic review and meta-analysis was conducted to assess the effect of tobacco on pregnancy and its outcomes. Among 13,189 studies, 210 were found suitable for inclusion in the systematic review, and 124 in the meta-analysis. The study communicated that active tobacco use during pregnancy was significantly associated with small for gestational age (SGA), shorter length and smaller head circumference at birth.⁸ Pizent A et al communicated that maternal smoking leads to exposure to toxic metals and there was an increased concentration of toxic metals in maternal and umbilical cord blood and placenta. However, a compromised antioxidant level was also observed among smoker pregnant women.⁹

Effects of Smoking on Maternal and Fetal Outcomes

Pregnancy is a unique experience for the women. Lifestyle modifications and diet have significant effect on the outcomes of pregnancy. Literature has revealed that smoking is prohibited during pregnancy moreover; it has fatal effect on maternal and fetal health. Shenoy RD et al highlighted that maternal outcomes have increased risk for gestational hypertension and fetal growth.¹ A study suggested that exposure to tobacco during pregnancy can lead to stunting and altered brain development during early childhood and may be later in life.⁸ In addition, Maessen et al conducted a study to assess anthropometry measurement in 22,421 adult daughters in association with their mothers' tobacco smoking early in pregnancy in Sweden. Daughters whose mothers were Light and Heavier smokers in early pregnancy were 0.8 cm and 1.0 cm shorter, BMI 0.84 kg/m² and 1.15 kg/m² higher and 2.3 kg and 2.6 kg heavier,

respectively, than daughters of Non-smokers mothers. The relative risk of short height was 55% higher in women with smoking habits.¹⁰ In terms of fertility, a study revealed that smoking during pregnancy affects the fertility, perinatal mortality and increased risk of spontaneous abortion among women while, low birth weight and preterm birth among infants. A systematic review highlighted the effect of maternal smoking on placental vascularization.⁷ During pregnancy, maternal smoking is significantly associated with an increased risk of short height and obesity in their adult daughters.¹⁰ A prospective study highlighted that smoking during pregnancy cause prolong third stage of labour, low birth weight infant and larger placenta.⁴ Frazer K et al reported that smoking is a modifiable risk factor during pregnancy. It is associated with increased risks of ectopic pregnancies, placenta praevia, pre-eclampsia, and reduced foetal outcomes including mortality, low birth weight, and sudden infant death syndrome.¹¹ Moreover, the risk of sudden infant death syndrome, altered neuro-cognitive development and behavioral problems are associated with maternal smoking during and after pregnancy. A cross-sectional study revealed that among these tobacco user mothers, 1.7 % infants have neural tube defect.¹² Moreover, Smoking during pregnancy has various hazards of maternal health and outcomes.

Conclusion

Maternal and fetal health is important for the overall development of the community health status. Maternal smoking during pregnancy is not recommended by the WHO. Smokers and nonsmokers mothers are at risk of tobacco smoke. The toxins cross placenta barriers and affect fetal circulation and fetal growth. Smoking during pregnancy has various consequences of the maternal outcomes. Declining the smoking habits during pregnancy is a global challenge. Educational interventions regarding anti-tobacco campaigns and quit-smoking initiatives should be planned and implemented for pregnant women. We suggested that pregnant women should be sensitized for the cessation of smoking. During antenatal visits, healthcare providers have to counsel the women regarding fatal effects of smoking during pregnancy. This initiative may be effective in minimizing the harmful maternal and fetal outcomes.

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