Obesity and passive smoking reduce oxygen supply to unborn baby

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Babies born to mothers with obesity and exposed to passive smoking are more likely to have health problems than others. This conclusion is based on evidence of elevated levels of nucleated red blood cells in the umbilical cord reported in the *International Journal of Food Safety, Nutrition and Public Health*.

Pediatrician Abd ElBaky of the National Research Centre, in Cairo, and colleagues there and at Cairo University, Egypt, have found that obesity and passive smoking are risk factors for elevated umbilical cord neonatal immature, or nucleated red blood cells (NRBCs). Raised levels of NRBCs are indicative of a degraded oxygen supply to the baby during the pregnancy.

The team compared NRBC count in umbilical blood in three groups. Group I neonates (29 infants) were born to obese mothers. Group II (21 babies) were born to mothers exposed to tobacco smoke during pregnancy and a control group III (15 members). The team found that NRBC count was higher in groups I and II compared to the control group III. They also found that maternal body mass index (BMI) and infant birth weight were significantly higher in group I.

The team explains that, obesity in young and women is on the increase and is a known risk factor for a range of health problems. Maternal obesity at conception affects gestational metabolic adjustments, the placenta, and fetal growth and development. They add that neural tube defects and other developmental anomalies are more common in infants

born to obese women. Pre-eclampsia, a potentially life-threatening condition involving raised blood pressure, is also more common in obese pregnant women.

Critically, the team says, fetal development during the last half of pregnancy depends on maternal metabolic adjustments detected by placental hormones and the subsequent oxygen and nutrient supply. If these are compromised, through obesity issues or exposure to tobacco smoke, then serious problems can occur.

The mechanisms that link the raised levels of immature blood cells in the samples to obesity and passive smoking or complicated. Obesity is known to affect metabolism, hormones, blood pressure and other physiological factors. Tobacco smoke inhalation whether direct or indirect may affect the amount of oxygen reaching the unborn child, because hemoglobin is poorly oxygenated. Nicotine can also cause narrowing of blood vessels, vasoconstriction, and so reduce oxygen supply through that mechanism too.

The team speculates that even apparently healthy newborns of obese mothers and passive smokers may suffer subtle effects of the reduced oxygen levels during the pregnancy. "We recommended that every effort to control maternal obesity and prevent exposure to tobacco smoke be made," the team says, they insist that "smoking regulations in the workplace and at home should be enforced strictly for the well-being of our infants."

More information: "Effect of maternal obesity and passive smoking on neonatal nucleated red blood cells" in Int. J. Food Safety, Nutrition and Public Health, 2010, 3, 57-63