



**Libyan International Medical University  
Faculty of Basic Medical Science**

**Effect of caffeine consumption during pregnancy**

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◆ **Abstract :**

Caffeine crosses the placenta to your baby. Although you may be able to handle the amounts of caffeine you feed your body, your baby cannot. Your baby's metabolism is still maturing and cannot fully metabolize the caffeine. Numerous studies on animals have shown that caffeine can cause spontaneous abortion , some behavior change and effect on infant growth and childhood weight.

◆ **Introduction :**

Caffeine is one of the most commonly consumed stimulants in the general population. It is found in a variety of foods and beverages, including coffee, tea, chocolate, cocoa products, soft drinks, and energy drinks. In addition, it is increasingly used as an ingredient in prescription and over-the-counter medications for colds, influenza, headache, menstrual symptoms, weight loss, and central nervous system stimulation. The effects of caffeine on the body are mediated via interaction with a number of receptors, including adenosine, adrenergic, cholinergic  $\gamma$ -aminobutyric acid, and serotonin receptors. After ingestion, caffeine is readily absorbed into the bloodstream and distributed to the tissues. During pregnancy, elimination of caffeine is prolonged and it rapidly passes all biological membranes, including the blood-brain and placenta barriers, resulting in exposure of the fetus and infants poorly metabolize caffeine until 3 months of age. A maximum intake level of caffeine for pregnant women has been stipulated by several authorities, most of which agree that it should not exceed 200 mg/day.<sup>(1)(2)(3)</sup>

◆ **Discussion :**

our studies have been conducted on potential associations between caffeine and spontaneous abortion, congenital malformations, and fetal growth restriction . shows if less than 300 mg/d is consumed; there is no increased risk of spontaneous abortion . Demonstrated that caffeine consumption during pregnancy increases levels of catecholamines and cellular cyclic adenosine monophosphate that may affect blood flow to the fetus through vasodilation pathways.<sup>(1)</sup> While minimal effects of caffeine ingestion during pregnancy on neurodevelopment and behaviour in infants and children.<sup>(2)</sup> maternal caffeine intake during pregnancy was associated with a higher risk of excess growth in infancy and overweight in early childhood. In addition, caffeine intakes in pregnancy above the recommendation (200 mg/day) were associated with modified growth from very early in life and maintained during childhood. More specifically, children exposed prenatally to caffeine levels above 200 mg/day had persistently higher weight velocity, BMI velocity and weight gain velocity up to 8 years of age. The biological plausibility supporting findings is mainly provided by animal studies where, prenatal exposure to caffeine was shown to program the offspring towards excess growth and cardiometabolic disorders through alterations (1) in the hypothalamic-pituitary-adrenocortical axis that plays a key role in growth and metabolism (2) in regulation of adenosine and adenosine antagonists, which are important modulators of development and (3) in the placental expression and transportation of leptin, essential for appetite regulation.<sup>(3)</sup>

◆ **Result and method:**

1- We investigated the relation between caffeine consumption and spontaneous abortion in 2,967 pregnant women planning to deliver at Yale-New Haven Hospital in 1988-1992. We evaluated coffee, tea, and soda drinking in the first month of pregnancy in interviews before the end of the sixteenth week of gestation. We obtained information on 98.2% of the pregnancies (including 2,714 singleton live-births and 135 spontaneous abortions).<sup>(1)</sup> Result for this study revealed that : An increasing dose of daily caffeine intake during pregnancy was associated with an increased risk of miscarriage, compared with no caffeine intake, with risk 1.42 for caffeine intake of less than 200 mg/day, and 2.23 for intake of 200 or more mg/day, respectively . In addition, the magnitude of the association appeared to be stronger among women without a history of miscarriage (risk 1.48 to 3.67) than that among women with such a

history (risk 0.34 to 1.94). As compared with abstinence from caffeine beverages (coffee, tea, and soda), the adjusted odds ratios for spontaneous abortion associated with consumption of 1-150, 151-300, and > 300 mg caffeine daily were 0.81, 0.89 and 1.75 respectively . In this study, caffeine consumption is more strongly related to spontaneous abortion than alcohol or cigarette use in early pregnancy.<sup>(1)</sup>

2-. A cohort study of 885 children born in Brazil demonstrated risk of frequent nocturnal awakening (more than 3 episodes per night) at 3 months postpartum when examining women consumed an average of 144 mg/d of caffeine and (300 mg/d or greater). This study reported: no adverse effects on child behavior and no risk of frequent nocturnal awakening with the consumption of moderate amounts (144 mg/d) of caffeine during pregnancy where Almost 20% of mothers were heavy caffeine consumers during pregnancy more than 300 mgdl / increase incidence of frequent night awakening in children tended to increase, (22.5% vs 13.5% ).<sup>(2)</sup>

3- A study was conducted within the Norwegian Mother and Child Cohort Study. Pregnant women from all over Norway were recruited during 1999–2008 and 40.6% of the invited women consented to participate. The cohort now includes 50 943 mother-child pairs . Follow-up of the participants, after delivery, have been conducted at 6 months, 18 months, 36 months, 5 years, 7 years and 8 years. the mothers examined for caffeine consumption during pregnancy while the child examined for weight and rate of growth. we found that: The prevalence of excess growth in infancy increased from 23% to 29% as prenatal caffeine intake increased from low to very high . children born to average, high and very high caffeine consumers had 1.15, 1.30 and 1.66 to higher growth in infancy, compared with children born to low consumers . The prevalence of overweight increased by 5% at age 3 years, by 6% at age 5 years and by 3% at age 8 years with increasing prenatal caffeine exposure from low to very high . Children born to average, high and very high caffeine consumers had 1.05, 1.17 and 1.44 higher for overweight at age 3 years, compared with children born to low caffeine consumers.<sup>(3)</sup>

#### ◆ Conclusion

Caffeine is the world's most widely consumed central nervous system stimulant. It occurs naturally or is added to foods and beverages, with coffee and tea as the most common and major sources . We found that the risk of spontaneous abortion , minimal change in baby behavior and excess infant growth and overweight in childhood is increasing with maternal caffeine intake Maternal caffeine intake >200 mg/day during pregnancy.

#### ◆ Reference :

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