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Original Article

EVALUATION OF CAFFEINE CONSUMPTION AND EFFECT DURING PREGNANCY AMONG WOMEN IN THE UAE

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ABSTRACT

Objective: To investigate the relationship between caffeine consumption among pregnant women in the UAE and spontaneous abortion and stillbirth.

Methods: A retrospective cross-sectional survey has been conducted on 97 pregnant ladies randomly selected from Al Ain city in the UAE. Only pregnant women with caffeine intake were included in the study.

Results: The results showed that: 61.9% of women consumed coffee, 34% consumed tea, and 4.1% consumed soft drinks during pregnancy. 43% of women who consumed caffeine during pregnancy had at least one spontaneous abortion, 10.3% suffered from stillbirth and 17.5% gave birth to underweight babies. Cross tabulation between spontaneous abortion and caffeine consumption did not show high significance using Pearson Chi-Square for correlation (p-value 0.103), The likelihood ratio shows significant results (p-value 0.039).

Conclusion: Providing comprehensive counselling for pregnant women is essential in order to prevent the negative impact of caffeine consumption.

Keywords: Caffeine, Pregnant, Abortion, Miscarriage

INTRODUCTION

Caffeine is the most widely used psychological stimulant available and provided in the form of drinks like coffee, tea, fizzy drinks, in the form of tablets alone or in combination with analgesics. The safety and health benefits of caffeine are controversial since the amount, a form of consumption and the person's health status can all have an impact on its effect.

Caffeine ingestion during pregnancy may have some negative impacts: decreased maternal blood supply and increased adrenaline placental concentration may lead to perinatal risk. Caffeine affects the body through many receptors including adenosine, adrenergic, cholinergic and serotonin receptors [1, 2].

The risk of spontaneous abortion and premature labour could be due to high caffeine consumption; a study done in the seventies could not prove a direct link between caffeine intake and spontaneous abortion but 13 out of 16 pregnant women who ingested more than 600 mg of caffeine daily had some sort of spontaneous abortion [3].

Another study carried out in the eighties on 3135 pregnant women with around 100 mg/day ingestion of caffeine showed an increase risk of spontaneous abortion in late pregnancy [4].

This result is supported by a study done in 2008 which concluded that the increase in caffeine consumption increased the risk of miscarriage [5].

A meta-analysis carried out in 2015 proposed a significant link between caffeine consumption and spontaneous abortion [6].

The objective of this study was to investigate the relationship between caffeine consumption among pregnant women in the UAE and abortion and stillbirth.

MATERIALS AND METHODS

Methods

A retrospective cross-sectional survey was conducted on 97 pregnant ladies randomly selected from the city of Al Ain in the UAE. Only pregnant women with caffeine intake were included in the study. All comorbidities were excluded from the study. All women were asked about their past experience regarding caffeine intake and maternal complications. Data were collected and analysed using SPSS statistical program. The analysis used cross-tabulation with correlation tests.

RESULTS

This study included 97 female subjects. The results showed that: 61.9% (60) of the women consumed coffee, 34% (33) consumed tea, and 4.1% (4) consumed soft drinks during pregnancy. 43% (42) of women who consumed caffeine during pregnancy had at least one spontaneous abortion, 10.3% (10) suffered from stillbirth and 17.5% (17) had given birth to underweight babies. Table 1 shows the relation between the amount of caffeine consumption and abortion.

Even though all women who consumed more 400 mg of caffeine on daily bases had spontaneous abortions, cross tabulation between spontaneous abortion and caffeine consumption did not show high significance using Pearson Chi-Square for correlation (p-value 0.103). The likelihood ratio shows significant results (p-value 0.039).

Additionally, 12 out of 97 women confirmed that their children faced the following complications after birth: 9% faced faster heart rates, 33% faced increased breathing rate, and 58% spent more time awake.

Eighty-five percent of spontaneous abortions happened in the first trimester and only one spontaneous abortion in the third trimester.

Table 1: Caffeine consumption and abortion

	Caffeine consumption in mg				
Abortion	**<75**	**75-200**	**200-300**	**300-400**	**>400**
Yes	3	21	3	9	6
No	23	18	1	13	0

DISCUSSION

Caffeine is 1,3,7-trimethylpurine-2,6-dione which has more than 200 different names; it is an alkaloid available in many natural plants. The exact amount of caffeine available in food products is not always provided accurately; this makes it very difficult to measure the exact amount consumed on daily bases. Relating caffeine consumption to certain types of food like tea, coffee, chocolate, etc. may lead to over-consumption and negative side effect especially during pregnancy [7, 8]. This addictive substance is used by more than 80% of the population worldwide. Genetic factors play a crucial role in the response to caffeine intake; this leads to a variation in the effect of caffeine on health outcomes [9]. Some of these effects were positive such as increasing brain activity, stimulant effect, and many others. On the other hand, many negative effects have been documented such as fatty liver, low birth weight, abortion and many others [10].

The aim of this study was to evaluate the effect of different concentrations of caffeine intake on pregnancy in the UAE. The participants were asked about the possibility of maternal risk particularly spontaneous abortion or miscarriage. The results illustrated that the increase in caffeine consumption plays a crucial role in the incidence of spontaneous abortion or miscarriage. These results supported by many studies: One study concluded that the increase in caffeine consumption is associated with the risk of spontaneous abortion[11]. On the other hand, a Danish study done in 2012 contradicted these results; it showed that there was no clear association between caffeine and spontaneous abortion. Although this study measured the effect of ephedrine and caffeine consumption on pregnant women, the negative effect could be due to ephedrine. But since it was a combination diet drug, it is difficult to rule out the effect of caffeine [12-15]. Caffeine is abundant in many drinks as mentioned earlier [16, 17]. The fact that it is found in so many drinks can often make it difficult to avoid even during pregnancy. It's hazardous effect during pregnancy is due to the absence of cytochrome P450 1A2 (CYP1A2), in both the placenta and the fetus which results in the accumulation of caffeine in the central nervous system of the fetus [18, 19]. The decrease in caffeine metabolism during the first and third trimester increases the chance of caffeine accumulation in the fetus [20]. The presence of caffeine in the placenta is added aetiology for spontaneous abortion that should not be neglected [21]. The threshold where caffeine could result in spontaneous abortion is still not evident, but caution is important in this matter until a clear association between the amount of caffeine consumed and the induction of abortion is established [22]. The maximum caffeine consumption during pregnancy is 300 mg/day according to WHO. If the daily allowance is exceeded, many other undesirable symptoms might occur other than spontaneous abortion including low birth weight and decreased cognitive behaviour among new-born babies [23]. Childhood obesity might also result from a high dose of caffeine ingestion during pregnancy; this fact is supported by a prospective cohort study done in 2014 [24]. The mechanism by which caffeine cause obesity is not fully understood but since the brain is the main part in the body to control satiety, caffeine effect on the fetal brain might play a significant role in the development of obesity after birth. Animal studies proved the effect of caffeine on glucose metabolism and the development of insulin resistance. This may be the explanation of the increased incidence of childhood obesity. This effect should warrant a public concern about the use of caffeine during pregnancy [25, 26]. According to a meta-analysis study carried out in 2014, "Low caffeine intake (50 to 149 mg/day) was associated with 13% low birth weight. A moderate caffeine intake (150 to 349 mg/day) was associated with a 38% low birth weight, and high caffeine intake (≥350 mg/day) with a 60% higher risk of low birth weight as compared with very low or no caffeine intake". According to this study, the negative impact is directly proportional to the concentration of caffeine taken every day. Each 100 mg caffeine increment increases the chance of low birth weight by 13 % [27].

CONCLUSION

This study emphasizes the possibility of an adverse effect of caffeine on pregnancy. The effect was dose-dependent which agrees with many published literature. Providing comprehensive counselling for pregnant women is mandatory in order to prevent the negative impact of caffeine consumption. I is recommended that more animal studies should be conducted on pregnant rats and rabbits in order to further explain the direct effect of caffeine on pregnancy since clinical trials is not ethically feasible.

CONFLICT OF INTERESTS

Declared none

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