

CASE REPORT

DOI: 10.5336/jcog.2021-86162

Caffeine Consumption During Pregnancy and Brief Resolved Unexplained Event in a Newborn

Saleh AL-ALAIYAN^a, Weam ELSIDAWI^a^aDepartment of Pediatrics, Neonatal Intensive Care Section, King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia

ABSTRACT Caffeine is a very commonly used substance. has been associated with negative pregnancy outcomes. We present a neonate with brief resolved unexplained event presumable due to heavy coffee consumption during pregnancy. The neonate presented with symptoms in the form of apnea and cyanosis that required vigorous stimulation to return him to spontaneous breathing. Sepsis, congenital heart disease, seizure and inborn error of metabolism were all excluded. he mother reported that during pregnancy she was consuming 1-2 large cups of brewed coffee (480 mL) every day that volume of coffee contained 265-300 mg. The neonate overtime improved when withdrawal effect of caffeine resolved. We advise pregnant women and women planning to get pregnant to limit caffeine consumption.

Keywords: Newborns; pregnancy; caffeine; apnea

Caffeine is a very commonly used substance. It is absorbed quickly and crosses the human placenta to the fetus with serum concentrations similar to their mothers.¹ Caffeine may directly affect the fetal development and growth.²⁻⁴ Nonetheless, heavy caffeine intake during pregnancy might increase the risk of sudden infant death syndrome (SIDS). A study showed that mothers consumed 400 mg/day or more of caffeine at the first trimester had infants with an increased risk for SIDS.⁵ It is not easy to calculate the consumed amount of caffeine during pregnancy, however, taking a detailed history of caffeine consumption may be close estimate to the true ingestion. This can be calculated by summing the average amount of brewed coffee [filter 100-115 mg per 180 mL cup. large cups (480 mL) contain 265-300 mg].⁶ In this case report, we present a neonate with brief resolved unexplained event (BRUE) due to heavy coffee consumption during pregnancy.

CASE REPORT

We report a male newborn, second child of a 34-year mother who was born at 37 weeks of gestation by spontaneous vaginal delivery with a birth weight of 3,330 grams. Following his delivery, the newborn required the initial steps with excellent Apgar scores (7 and 9 at 1 and 5 min). The pregnancy was uneventful and there was no family history of similar condition. The neonate was discharged home on the second day on breast milk and formula. He was asymptomatic until 3 days of age when he became apneic, cyanosed and flaccid. This happened during sleep and after he was fed. There were no vomiting or abnormal movements. The neonate was vigorously stimulated then took a breath and became pink. A similar episode occurred 24 hours after the first one. The neonate was admitted to the hospital where he was started on ampicillin and gentamicin for possible sepsis but all cultures (blood, cerebrospinal fluid and urine) came

Correspondence: Saleh AL-ALAIYAN

Department of Pediatrics, Neonatal Intensive Care Section, King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia

E-mail: alaiyan@kfsshr.edu.sa



Peer review under responsibility of Journal of Clinical Obstetrics & Gynecology.

Received: 10 Sep 2021

Received in revised form: 22 Feb 2022

Accepted: 24 Feb 2022

Available online: 25 Feb 2022

2619-9467 / Copyright © 2022 by Türkiye Klinikleri. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

back negative. Chest X-ray, echocardiogram and electroencephalogram were performed and all were reported normal. He experiences a third episode while he was in the hospital that was associated with apnea, bradycardia and desaturation down to 65%. Basal complete blood count, arterial blood gas analysis, renal and hepatic profiles were all normal. Inborn errors of metabolism were excluded by tandem mass spectrometry. Although there was no history of vomiting, but he was started on anti-regurgitation milk formula during his stay in the hospital. The mother reported that during pregnancy she was consuming 1-2 large cups of brewed coffee (480 mL) every day that volume of coffee contained 265-300 mg. He was discharged home in a good health and was seen at 3 weeks of age as an outpatient with excellent weight gain on mixed breast milk and formula with no recurrence of the event.

A verbal consent was obtained from the mother of newborn in this case report.

DISCUSSION

In this case report, we present a neonate with BRUE that required vigorous stimulation. Cardiac, seizure, septic causes were excluded. The neonate improved overtime and discharged home in a good health. The possible causes of BRUE are gastrointestinal, neurological, respiratory, cardiovascular, metabolic and endocrine. Infants who experience a BRUE are often asymptomatic upon arrival at the hospital, thus a very thorough and detailed history should be obtained from the witness. Although, the level of caffeine in the mother was not estimated, but taking detailed history of caffeine consumption during pregnancy was very adequate to say that this mother consumed large amount of caffeine during pregnancy.

In this case report, we believe that the cause of BRUE was a complication of caffeine withdrawal due to heavy caffeine consumption during pregnancy. It has been reported that maternal caffeine intake during pregnancy has been associated with increased episodes of central apnea in infants. Chronic fetal ex-

posure to caffeine increases the number of adenosine receptor sites in the brainstem causing respiratory depression in neonates. After delivery, newborns will experience caffeine withdrawal on day 3 to 5, when the clearance of caffeine from their bodies is completed.

SIDH has been shown to be associated with heavy caffeine consumption during pregnancy. In a case control study, authors found that infants whose mothers had heavy caffeine consumption throughout their pregnancy had a significantly increased risk for SIDS (odds ratio 1.65; 95% confidence interval 1.15 to 2.35) after adjusting for likely confounding factors.⁵

Chronic fetal exposure to caffeine may have long term effect on the future development, through alterations in DNA methylation.⁷

In conclusion, consumption of caffeine by pregnant women is associated with negative pregnancy outcomes and there is no harmless level of consumption.⁸ Thus, pregnant women and women planning to be pregnant should be advised to limit caffeine consumption.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Saleh AL-Alaiyana; **Design:** Saleh AL-Alaiyana; **Data Collection and/or Processing:** Saleh AL-Alaiyana, Weam Elsidawia; **Analysis and/or Interpretation:** Saleh AL-Alaiyana; **Literature Review:** Saleh AL-Alaiyana.

REFERENCES

1. Kuczkowski KM. Caffeine in pregnancy. *Arch Gynecol Obstet.* 2009;280(5):695-8. [[Crossref](#)] [[PubMed](#)]
2. al-Alaiyan S, al-Rawithi S, Raines D, Yusuf A, Legayada E, Shoukri MM, et al. Caffeine metabolism in premature infants. *J Clin Pharmacol.* 2001;41(6):620-7. [[Crossref](#)] [[PubMed](#)]
3. Morris MB, Weinstein L. Caffeine and the fetus: is trouble brewing? *Am J Obstet Gynecol.* 1981;140(6):607-10. [[Crossref](#)] [[PubMed](#)]
4. CARE Study Group. Maternal caffeine intake during pregnancy and risk of fetal growth restriction: a large prospective observational study. *BMJ.* 2008;337:a2332. Erratum in: *BMJ.* 2010;340. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
5. Ford RP, Schluter PJ, Mitchell EA, Taylor BJ, Scragg R, Stewart AW. Heavy caffeine intake in pregnancy and sudden infant death syndrome. New Zealand Cot Death Study Group. *Arch Dis Child.* 1998;78(1):9-13. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
6. Fenster L, Eskenazi B, Windham GC, Swan SH. Caffeine consumption during pregnancy and fetal growth. *Am J Public Health.* 1991;81(4):458-61. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
7. Rivkees SA, Wendler CC. Long-term consequences of disrupting adenosine signaling during embryonic development. *Mol Aspects Med.* 2017;55:110-7. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
8. James JE. Maternal caffeine consumption and pregnancy outcomes: a narrative review with implications for advice to mothers and mothers-to-be. *BMJ Evid Based Med.* 2021;26(3):114-5. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]