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CASE REPORT

Neonatal Outcome After the Use of Synthetic Cannabinoid Bonzai in Pregnancy: A Case Report and Brief Review of Literature

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ABSTRACT

A 34-year-old nulliparous woman with an unplanned pregnancy reported regular smoking herbal products containing synthetic cannabinoid. Prenatal sonographic examinations at each trimester revealed normal fetal growth. Detailed anomaly scan findings were normal and compatible with gestational age. The patient gave birth to a healthy baby at 38th gestational week by cesarean section. The physical and neurological examination of the baby was found to be normal after birth and during the 6 month follow- up period. There is no published studies on synthetic cannabinoid use in pregnancy. This report describes an unique case of synthetic cannabinoid exposure in human pregnancy. To determine the effects of these drugs in pregnancy, further reports and studies are needed.

Key words: Synthetic cannabinoid, pregnancy outcome, drug abuse

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INTRODUCTION

Maternal substance use disorder during preconception and pregnancy is associated with the increased risk of adverse perinatal outcomes such as low birth weight and preterm delivery [1]. Cannabis is the most commonly used illicit drug among pregnant women. Cannabis smoke includes various chemicals, and tetrahydrocannabinol (THC) is the main psychoactive component in natural cannabis [2].

In recent years, a variety of smoking mixtures under the different brand names like "Spice/ K2/ Bonzai" have become increasingly popular among adolescents. These herbal products include leafy materials laced with synthetic cannabinoids bound to cannabinoid- like receptors, and they are stronger than natural cannabis [2]. Because the cannabinoids are often mixed with tobacco or botanicals when smoked, it is difficult to estimate the harmful effects of these drugs.

It is well established the relationship between cannabis and pregnancy in humans, but data regarding prenatal exposure to synthetic cannabinoids are limited to preclinical animal studies. This report presents an unique case of synthetic cannabinoid exposure in pregnancy and neonatal outcome.

CASE PRESENTATION

A 34-year-old nulliparous woman diagnosed with bipolar disorder for 4 years had been Bonzai user for the last 6 months. She had no response to lithium treatment. When her pregnancy was discovered in the 5th week, she had a depressive episode treated with escitalopram (10 mg/day), quetiapine (200 mg/day), venlafaxine (150 mg/day) and lamotrigine (100 mg/day). She had no alcohol consumption, but she smoked 10 cigarettes per day. The patient was referred by her psychiatrist to our clinical

pharmacology consultation service. She was informed about the potential effects of the medications on the fetus, and antidepressant treatment was continued with low dose of quetiapine (100 mg/day).

A detailed fetal ultrasonography was offered to scan the development of the fetus at about 20th gestational week. Patient's medical history was documented through the drug risk consultation. After expected date of delivery, information about pregnancy outcome and baby's growth was obtained from the patient and her family physician.

In the 8th, 17th and 28th weeks of her pregnancy, prenatal sonographic examinations revealed normal fetal growth and amniotic fluid volume. Detailed anomaly scan findings were reported to be normal. The patient had a serious fear of childbirth and she gave birth to a healthy boy by cesarean section at the 38th week. The baby's Apgar scores were recorded as 9 in the first minute and as 10 in 5th minute. Birth weight was 3150 g (25- 50th), length was 49 cm (25- 50th) and head circumference was 35 cm (25- 50th). The patient continued quetiapine monotherapy and decided not to breastfeed. The physical and neurological examinations of the baby revealed normal findings with no birth defects. The mother and her baby had no neuropsychiatric and perinatal complications.

Follow-up controls were monthly performed by the family physician. Weight, supine length and head circumference measurements were recorded at the periodic visits, plotted and analyzed on the growth chart (Data shown in Table 1). Additionally, cognitive, fine- gross motor, social- emotional and language development were assessed at each visit. The physical growth and neurological development were uneventful for the infant at 6 months of age.

Written informed consent was obtained from the patient for publication of this case report.

Table 1. Baby's growth during the follow-up period

Age	Weight (g)	Weight Percentile	Length (cm)	Length Percentile	Head Circumference (cm)	Head Circumference Percentile
At birth	3150	25- 50th	49	25- 50th	35	25- 50th
1 month	3500	25- 50th	51	25- 50th	36	25th
2 month	4030	25th	53	25th	38	25th
3 month	5600	25th	58	25th	40*	25th
4 month	6600	25- 50th	62	25th	41	25th
5 month	7250	25- 50th	64	25- 50th	42	25th
6 month	7900	25- 50th	67	25- 50th	43	25th

*The posterior fontanelle was closed.

DISCUSSION

Cannabinoids are classified into three groups according to their origins: phytocannabinoids, endocannabinoids and synthetic cannabinoids. The well-known examples of phytocannabinoids that are derived from cannabis plant are delta-9-tetrahydrocannabinol (THC), cannabidiol (CBD) and cannabinol (CBN). Endocannabinoids are produced in the body and act as intracellular modulators for a variety of physiological processes.

About 50 years ago, synthetic cannabinoids were developed as analogues of tetrahydrocannabinol for potential therapeutic uses; however they were used as smoking mixtures in recent years. The products are considered as "designer drugs" and sold via internet or in head shops with different brand names like Spice, K2. According to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) Report in 2008, the psychoactive effects of "Spice" products are due to added synthetic cannabinoids. JWH-018, an agonist at CB1 and CB2 cannabinoid receptors, are the first reported synthetic cannabinoids in some samples of herbal mixtures

[2]. In 2013, Gurdal et al. presented a review of detection frequency of synthetic cannabinoids in Istanbul and its surrounding area. In this study, it was reported that 1179 samples (98.3%) of 1200 herbal compounds included synthetic cannabinoids, and JWH-018 was available in 1172 (99.4%) samples. The most common product names were "Bonzai Aromatic Potpouri" and "Bonzai Plant Growth Regulator" [3]. In recent years, many young people have died as a result of using Bonzai in Turkey [4]. Especially adolescents and young adults use synthetic cannabinoids instead of cannabis, because these products are not easily detectable in routine drug screening.

Cannabinoids have been found to across the placenta and reach to the fetus [5]. Preclinical studies have not shown a consistent pattern of defects with prenatal cannabinoid exposures. Limited data has been published on exposure to exogenous cannabinoids like THC, but no data on synthetic cannabinoid exposure in human pregnancy [6, 7]. Some researchers suggested that maternal THC use might be associated with impaired fetal growth, low birth weight, reduced length and smaller head circumference [8]. Inconsistent findings on neonatal behavior and infant cognitive development, as a result of the findings on birth outcomes have been also reported [9, 10]. There is no evidence of a specific pattern of congenital malformations in infants born to women with THC exposure.

According to a recent literature review by Sellers et al. (2017), there is no studies on synthetic cannabinoid use in pregnancy [11]. This report describes a unique case of synthetic cannabinoid exposure in human pregnancy. Toxicological analysis of fetal and maternal biological samples is important to identify synthetic cannabinoids. The findings obtained by analysis of biological samples could be compared with physical and neurological development of the baby. In this case referred to our drug consultation service, there was no toxicological analysis performed. Long term follow-up of pregnant patients using drugs might also be helpful to understand the effects of prenatal drug exposure. To determine the effects and possible toxicity of these drugs in pregnancy, further reports and studies are needed.

REFERENCES

[1] Bonello MR, Xu F, Li Z, et al. Mental and behavioral disorders due to substance abuse and perinatal outcomes: a study based on linked population data in New South Wales, Australia. Int J Environ Res Public Health 2014;11: 4991-5005.

[2] Vardakou I, Pistos C, Spiliopoulou Ch. Spice drugs as a new trend: mode of action, identification and legislation. Toxicol Lett 2010;197: 157-62.

[3] Gurdal F, Asirdizer M, Aker RG, et al. Review of detection frequency and type of synthetic cannabinoids in herbal compounds analyzed by Istanbul Narcotic Department of the Council of Forensic Medicine, Turkey. J Forensic Leg Med 2013; 20: 667-72.

[4] Coban M. The rise of synthetic marijuana in Turkey: the Bonzai phenomenon of the 2010s. Addicta Turk J Addict 2014; 1: 41-62.

[5] Blackard C, Tennes K. Human placental transfer of cannabinoids. N Engl J Med 1984; 311: 797.

[6] Fergusson DM, Horwood LJ, Northstone K. Maternal use of cannabis and pregnancy outcome. BJOG 2002; 109: 21-7.

[7] Desai A, Mark K, Terplan M. Marijuana use and pregnancy: prevalence, associated behaviors, and birth outcomes. Obstet Gynecol 2014; 123 (Suppl 1): 46S.

[8] Hayatbakhsh MR, Flenady VJ, Gibbons KS, et al. Birth outcomes associated with cannabis use before and during pregnancy. Pediatr Res 2012; 71: 215-9.

[9] Huizink AC. Prenatal cannabis exposure and infant outcomes: overview of studies. Prog Neuropsychopharmacol Biol Psychiatry 2014; 52: 45-52.

[10] Jaques SC, Kingsbury A, Henshcke P, et al. Cannabis, the pregnant woman and her child: weeding out the myths. J Perinatol 2014; 34: 417-24.

[11] Sellers J, Nunes V. A Synthetic Cannabinoid Use in Pregnancy: A Brief Educational Intervention for Obstetric Providers and Patients. Obstet Gynecol 2017; 129: 97-8. doi: 10.1097/01.AOG.0000514958.58005.54

