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FETAL ALCOHOLIC SYNDROME: BIBLIOGRAPHIC REVIEW

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Abstract: Introduction: Alcohol use has a teratogenic effect throughout pregnancy, especially in the first trimester, and can lead to Fetal Alcohol Syndrome (FAS), identified by abnormal facial features, growth failure and neural problems. **Goal:** The present study aims to review articles in the national and foreign literature on FAS, analyzing causes, consequences and possible actions to prevent alcohol intake by pregnant women. **Methodology:** Searches for scientific articles were carried out in the virtual databases: SciELO, Google Scholar, PubMed, published between 2010 and 2018, and the most important references for the topic in question were selected. **Review:** The use of alcohol during pregnancy can harm fetal development and even cause miscarriage. Affected children have phenotypic changes common to Fetal Alcohol Syndrome Spectrum Disorder (FASD) or Fetal Alcohol Spectrum Disorders (FASD). Among the spectrum diagnoses, FAS is the most severe, evidenced by craniofacial deformities, microcephaly, thin upper lip, smooth philtrum, hearing loss and low birth weight. It can also favor the development of psychiatric illnesses by the mother and the child. Alcohol consumption by women is influenced by economic, personal and social factors. **Conclusion:** Fetal Alcohol Syndrome is dose-dependent, but there is no consensus on the minimum amount. Therefore, its prevention is carried out through abstinence. Since its incidence has increased in Brazil, it constitutes a public health problem. Therefore, immediate interventions are needed to raise awareness among pregnant women and encourage pre- and postnatal care.

Keywords: Fetal Alcohol Syndrome, alcohol use during pregnancy, Fetal Alcohol Spectrum Disorders.

INTRODUCTION

In 1967, Philip Lemoine described a pattern of anomalies seen only in children of alcoholic women. In 1973, Ken Jones and David Smith proposed that this set of anomalies would be called Fetal Alcohol Syndrome (FAS) (ALVES, 2016).

Alcohol is one of the best studied substances in terms of its effects on the gestational period, allowing that its harm to the fetus is well established in the literature. The consumption of alcoholic beverages by pregnant women can lead to abortion, stillbirth and prematurity. In addition, it can cause consequences of varying severity to the fetus, which constitute Fetal Alcohol Syndrome Spectrum Disorder (FASD), also known as Fetal Alcohol Spectrum Disorders (FASD) (WARREN; HEWITT; THOMAS, 2011; NASH, 2017).

FASD is an expression used to describe a variety of disabilities and diagnoses. Among the possible diagnoses are Fetal Alcohol Syndrome (FAS), Alcohol-Associated Neural Developmental Disorder (DDNA), Alcohol-related Birth Defects (ARBD) and Alcohol-Related Neurodevelopmental Disorders (alcohol). -related neuro developmental disorders - ARND) (BARBOSA et al., 2018; MESQUITA, 2010).

Fetal Alcohol Syndrome (FAS) is the most serious of these disorders. It is a permanent condition identified by facial changes, growth deficiency and problems in the Central Nervous System (CNS), which can lead to cognitive and behavioral problems (GOUVEA et al., 2010; BRITISH MEDICAL ASSOCIATION, 2016).

The diagnosis of FAS consists of confirming intrauterine alcohol exposure and evaluating clinical signs (ALVES, 2016).

In the last four decades, there has been a significant increase in the number of high-risk pregnancies, nursing consultations and

ultrasounds during the prenatal period. The characteristics of pregnant women and the care provided by obstetric nurses have changed (MARQUES et al., 2012). Therefore, the need for constant updating of primary care services is evident, in order to provide the best possible care for women and avoid the irreversible problems caused by the use of alcohol during pregnancy.

JUSTIFICATION

In recent years, alcohol consumption by women has increased significantly. As a result, there are even more cases of such consumption during pregnancy, especially by pregnant women who do not have information about the severity of alcohol consumption and its repercussions on the development of the fetus and neonate. The present study can, therefore, provide information regarding current considerations about Fetal Alcohol Syndrome (FAS), one of the most serious consequences of alcohol abuse during pregnancy. With such considerations, the primary care health team can better guide pregnant women about the existing risks and carry out prenatal care to monitor fetal and maternal health, in addition to having information about the risks of some actions during pregnancy, such as the use of alcohol. As it is a serious syndrome and cannot be treated, it is imperative to implement health prevention actions, mainly to raise awareness of the population, which is the primary purpose of this study.

GOAL

The present study aims to review articles in the national and foreign literature on Fetal Alcohol Syndrome (FAS), analyzing what predisposes pregnant women to alcohol consumption, the repercussions of this intake for the mother-fetus binomial and possible prevention actions in made by the Unified Health System (SUS) in Brazil.

METHODOLOGY

For this review, searches were carried out for scientific articles, in Portuguese and English, in the virtual databases: SciELO, Google Scholar, PubMed, published between 2010 and 2018. The most important references for the topic in question were selected.

The words and word associations used in the search were: Fetal Alcohol Syndrome, use of alcohol during pregnancy, Fetal Alcohol Spectrum Disorders.

REVIEW

EFFECTS ON THE MOTHER-FETUS BINOMIAL

The use of psychoactive substances throughout pregnancy, especially in the first trimester, can cause complications such as uterine hypertonia, placental vasoconstriction, uterine and placental hypoperfusion, restricting intrauterine development and facilitating placental detachment. It can also cause spontaneous abortion, premature labor, maternal and neonatal morbidity and mortality and meconium amniotic fluid. In addition, the use of alcohol by pregnant women increases the risk of cancers and psychiatric diseases, such as depression, which leads to an increase in suicidal behavior (BARBOSA et al., 2018; GUIMARÃES et al., 2018; RODRIGUES et al., 2018).

The alcohol ingested by the pregnant woman passes through the placental barrier and comes into contact with the fetus, whose metabolism is slow, so that the drug is impregnated in the amniotic fluid and inhibits biochemical reactions. Oxygen free radicals produced by ethanol metabolism destroy cellular proteins and lipids and accelerate programmed cell death (apoptosis) (DO NASCIMENTO et al., 2017).

Alcohol reduces glucose metabolism in the fetal brain and influences neurocortical maturation. If this occurs during the

period of neuroepithelial proliferation, neural differentiation is impaired, which affects the migration of neurons, resulting in severe changes in the structure of the neocortex. Thus, the brain is the organ most affected by the teratogenic effect of ethanol. The consequences are permanent malformations - mainly in the cerebellum, frontal and parietal lobes, corpus callosum and basal ganglia - that promote repression of learning and language skills and cognitive and motor skills. Such changes result from neuroapoptosis caused by acetaldehyde and oxygen free radicals (DO NASCIMENTO et al, 2017).

The frequent use of ethanol during pregnancy can adversely affect the child's memory, mental health, intelligence quotient, and visual and verbal performance (BAKARGI, 2017). Children with FAS are highly likely to develop behavioral disorders such as hyperactivity, antisocial personality and depression (GUIMARÃES et al., 2018). They may also have balance problems and difficulties with communication, hearing and attention. In addition, the brain activation patterns of children and adults with FAS are similar, which demonstrates that changes in the brain do not improve with age (U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, 2011).

On the other hand, exposure to alcohol during the postnatal period results in a decrease in the volume of breast milk, aggravated by lower production of cytokine and prolactin, since the suction of a baby with Fetal Alcohol Syndrome is lower (DO NASCIMENTO et al., 2017).

CLINICAL FEATURES AND DIAGNOSIS

The prevalent clinical signs of Fetal Alcohol Syndrome are craniofacial deformities (Figure 1), reduced brain volume, congenital heart defects, kidney abnormalities, thin upper lip, smooth philtrum (Figure 2), cleft lip, micrognathia, maxillary hypoplasia, language, microcephaly, palpebral fissure, cleft palate, hearing loss, prenatal and postnatal growth retardation and low birth weight (ALVES, 2016; RODRIGUES et al., 2018; SIMÕES; ZANCHETTA; FURTADO, 2016; NASH; DAVIES, 2017). The visual system is also affected due to the toxic action of alcohol. The most common ocular manifestations are: microphthalmia, myopia, hyperopia, strabismus, palpebral fissures, hypertelorism, optic nerve hypoplasia and tortuosity of retinal vessels (ALVES, 2016; NASH; DAVIES, 2017). Newborns may also have seizures during the first four weeks due to alcohol withdrawal syndrome.

Computer systems and 3D cameras have been developed to detect facial dysmorphologies. This technology would automate the diagnosis, reduce the need for consultation with specialists and allow an increase in FAS screening through telemedicine. The application of this technique in children of different ages allows faster detection of Fetal Alcohol Syndrome, noted with variable facial dysmorphologies in children of different ethnicities (U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, 2011).

The diagnosis of FAS is primarily clinical, however, it can be confirmed by biochemical data. The determination and quantification of fatty acid ethyl ester (EEAG), ethyl glucuronide (EtG) and ethyl sulfate (EtS) have been used to assess intrauterine exposure to alcohol by analyzing meconium, newborn hair and placenta (CASSINI; LINDEN, 2011).

[..] Absorbed ethanol [..] impairs the active displacement of amino acids; produces

increase in fatty acids; generates hypoxia

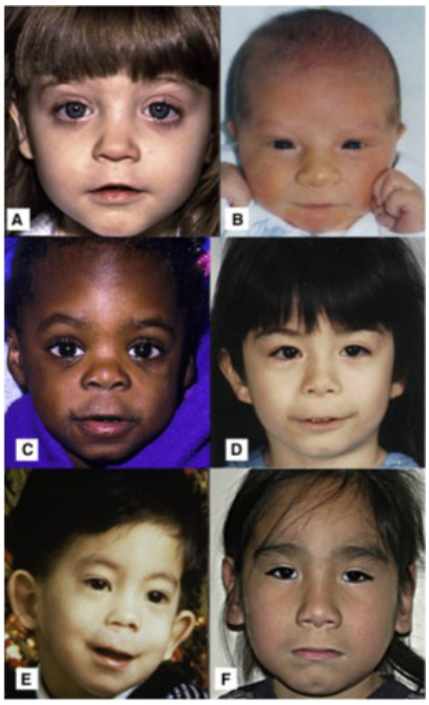

Figure 1: Fetal Alcohol Syndrome Phenotype.

Source: *Journal Of Pediatric Health Care*. Usado com permissão, 2016. Susan Astley, PhD, Universidade deWashington.

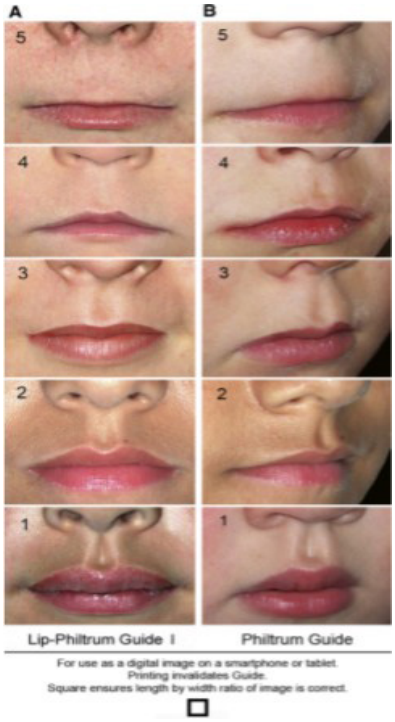

Figure 2: Guide used to analyze upper lip thickness and philtrum softness. Rows 4 and 5 exemplify the Fetal Alcohol Syndrome phenotype.

SOURCE: *Journal Of Pediatric Health Care*. Usado com permissão, 2016. Susan Astley, PhD, Universidade deWashington.

> causing vasoconstriction, which, in turn, increases hypoxia; hypoxia also compromises the circulation of amino acids and carbohydrates through the placenta; increases the supply of prostaglandins in various tissues; increases oxidative stress; alters the production of retinoic acid and neurotransmitters; affects folate circulation; inhibits vitamin A metabolism; causes cell death, etc. That is, it impairs organogenesis and/or fetal development in several spheres (QUEIROZ, 2017, p. 7).

POSSIBLE CAUSES OF ALCOHOL CONSUMPTION BY PREGNANT WOMEN

Preventing alcohol consumption during pregnancy requires understanding why women drink. Popova et al. analyzed in 2017, a Swedish study with young non-pregnant and nulliparous women that showed that most of them are aware of the potential harm of alcohol to the fetus. However, social factors (for example, not suspecting pregnancy), insufficient education (some felt that small doses would not be harmful) and personal factors (not wanting to stop enjoying the pleasure of alcohol, for example) are the reasons why they feel that practicing abstinence in pregnancy would be difficult.

Gouvea et al., in 2010, showed that a large number of women in Londrina/PR consumed alcohol during pregnancy. Most of them showed discomfort in providing data regarding alcohol consumption and belonged to the lower middle class and the poor class.

Factors such as low age, low education, low monthly income, non-cohabitation with a partner, living with groups that promote abusive consumption of alcohol, rural residence, social isolation, smoking, use of illicit drugs, unplanned pregnancy, late onset of prenatal care - and fewer prenatal consultations are also associated with alcohol consumption by pregnant women (MESQUITA, 2010; NASH; DAVIES, 2017).

On the other hand, low parity, access to education, religiosity, non-alcoholic partner and adequate nutrition are protective mechanisms against alcohol use by pregnant women, contributing to the prevention of FAS (MESQUITA, 2010).

PREVENTION AND TREATMENT

Advances in epigenetic research may collaborate to determine risk factors, which predict the severity of Fetal Alcohol Syndrome Spectrum Disorder (NASH; DAVIES, 2017). This contributes to the prevention of its most serious condition, that of Fetal Alcohol Syndrome.

To prevent FAS, the ideal is to stop drinking alcohol during pregnancy. There is no consensus on the minimum dose needed to affect the development of the embryo. If the pregnant woman has used alcohol, supplementation with antioxidants such as vitamin C, vitamin E, folic acid, beta-carotene and flavonoids can be used, since oxidative stress is one of the main pathways of damage caused by ethanol (SANTANA; ALMEIDA). ; MONTEIRO, 2014).

Fetal Alcohol Syndrome has no cure, however a variety of interventions can help parents and children to live with FAS, such as multidisciplinary parent support groups, stimulating environments for the child, school intervention and nutritional supplementation in the child's diet. Such proposals would help patients with the syndrome to live a more productive and satisfying life (U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, 2011).

CONCLUSION

The consequences of alcohol use during pregnancy are dose-dependent, but there is no consensus on the minimum amount.

Therefore, the prevention of FAS is carried out through abstinence. Since there is no cure and its incidence has increased in Brazil, it constitutes a public health problem. Therefore, immediate interventions are needed to raise awareness among pregnant women and encourage pre- and postnatal care.

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