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Management of Twin Pregnancies and The Risk of Fetal Death

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ABSTRACT:

Introduction: Twin pregnancies can present risks to both mother and fetus. One of the biggest concerns in twin pregnancies is premature birth.

Objectives: To discuss the management of twin pregnancies in order to avoid fetal death. **Material and Methods:** The methodology used was a literature review. The research was carried out through an electronic search of scientific articles published between 2010 and 2024.

Discussion: Complications such as premature birth, pre-eclampsia, intrauterine growth restriction and gestational diabetes are more common in twin pregnancies. Reducing these complications requires a well-coordinated, multidisciplinary approach that includes rigorous prenatal monitoring, appropriate medical interventions, nutritional and psychological support for the pregnant woman, as well as specific strategies for birth management.

Conclusion: Twin pregnancies are always special. They are always monitored differently and the risks of them happening are always greater. Health professionals should therefore do their utmost to be aware of all possible complications during twin pregnancies.

KEYWORDS: pregnancy; management of twin pregnancies; premature birth.

1. INTRODUCTION

Twin pregnancies occur when the ovary releases more than one egg and each one is fertilized by a different sperm (non-identical or bivitelline twins) or when only one egg is fertilized by a single sperm and divides, giving rise to two embryos (identical or univitelline twins) (PAGE et.al, 2015).

According to Francisco & Carvalho (2015), twin pregnancies have their particularities. Some complications can affect both the mother and the fetus.

There are less frequent cases of triplets (three fetuses), quadruplets (four fetuses) and even a larger number of fetuses born together. It is also common to think that twin siblings will be identical. However, there are several types of twin pregnancy, each of which has its own characteristics. In monochorionic and monoamniotic pregnancies, the fetuses share the same placenta and gestational sac, resulting in identical siblings (MAHONY et.al, 2011).

According to Louza et.al (2024), in monochorionic and diamniotic twin pregnancies there is one placenta but two gestational sacs. In this case, the fetuses will also be the same. In dichorionic and diamniotic twin pregnancies, there are two placentas and two gestational sacs, and the fetuses generated may or may not be identical.

Magalhães (2020) points out that a twin pregnancy can present risks to the mother and her unborn child. One of the biggest concerns of twin pregnancies is premature birth.

According to the American College of Obstetricians and Gynecologists (ACOG), half of twin pregnancies are delivered before the 37th week. The chances increase when there are more than two fetuses.

Twin pregnancies also carry a higher risk of pre-eclampsia and gestational diabetes. In addition, miscarriage, premature birth and placental abruption can occur. As a multiple pregnancy overloads the body, there is a greater chance of health problems for the pregnant woman and her unborn child (JAIN & PUROHIT, 2014).

The type of placenta is determined by when, in days, the embryo divides randomly into twins after fertilization of the egg (conception). Twinning in the first four days results in dichorionic or separated placentas, similar to those found in fraternal twins (FIGURE 1).

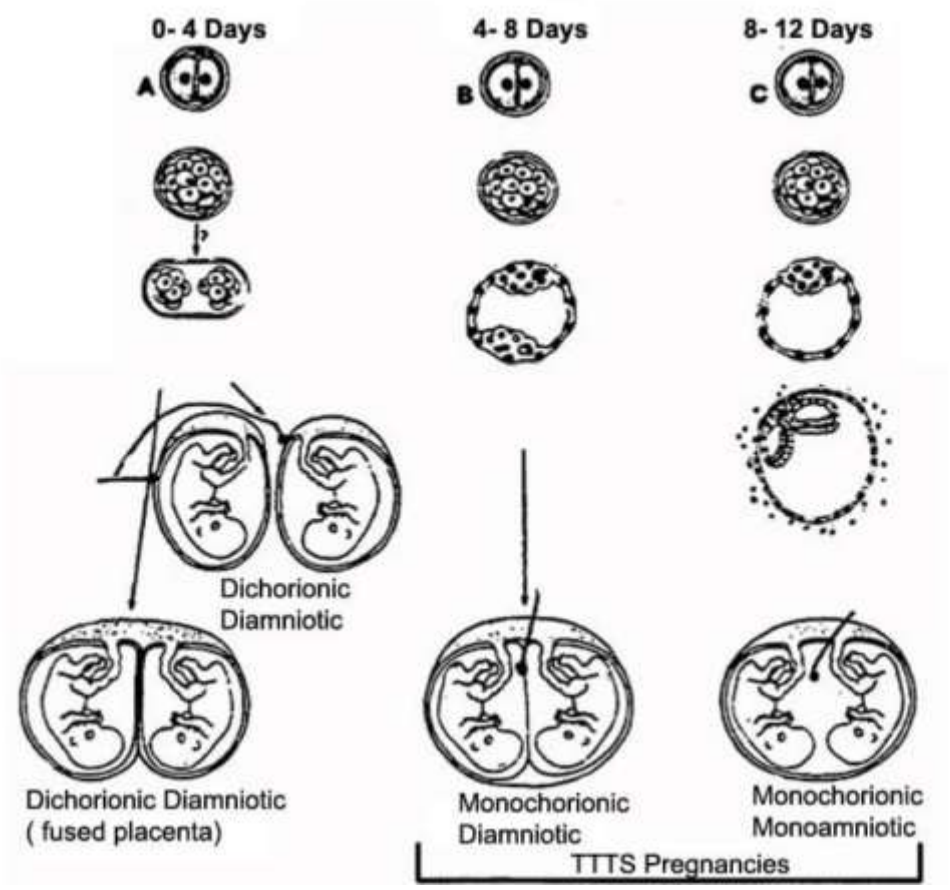

Figure 1. The type of placenta in identical twins is determined by when the twinning process occurs in the first two weeks of pregnancy. Twinning in the first four days results in separate placentas (dichorionic), after four days a shared placenta (monochorionic) with separate water sacs (diamnionic) and after eight days the twins share the placenta and water sac (monoamnionic). TTTS occurs in monochorionic twins. Source: tttsfoundation (2024).

According to Aslan et al (2024), the incidence of twin pregnancies increases with maternal age, peaking around the fourth decade of life. During this period, the maximum stimulation of follicle-stimulating hormone (FSH) increases the rate of development of multiple follicles. Despite this, the main factors responsible for the increase in twinning are assisted reproduction, ovarian hyperstimulation and in vitro fertilization (IVF). Maternal family history of twinning and multiparity are also associated with twinning, although to a lesser extent.

Rodrigues et al (2024) highlights the use of bedside ultrasound in the management of gynecological and obstetric pathologies. For the author, it is essential that all women with twin pregnancies undergo an ultrasound examination between 11 + 0 and 13 + 6 weeks of gestation (head-neck length 45-84 mm).

This examination is crucial for assessing fetal viability, gestational age and chorionicity. In diamniotic monochorionic pregnancies, the inter-twin membrane becomes progressively thinner after 9 weeks. A characteristic "T" sign is seen on ultrasound with a sensitivity of 100% and a specificity of over 98% for detecting monochorionic diamniotic pregnancy (SAITO et.al, 2019).

Coelho et.al (2011) reports that in dichorionic diamniotic pregnancies, the "twin peak" or lambda sign is characteristic, with a sensitivity of over 97% and a specificity of 100% in predicting chronicity. It is good practice to determine amnionicity at the same time and document it too.

For Francisco & Carvalho (2015), other echographic signs to determine chorionicity, especially when women present after 14 weeks of gestation, include the number of placental masses, the number of gestational sacs and the concordant sex of the fetuses, but the most valuable sign is the interim membrane using two-dimensional echography, which is considered highly accurate, with a very high sensitivity and specificity. Pregnancies of more than 34 weeks are usually terminated. If under 24 weeks, the mother or even the family, if the mother is not conscious (which is more common), is advised to terminate the pregnancy to save the woman's life.

The twin mother's physiological conditions must be monitored, especially in the first few weeks after giving birth. Blood pressure usually returns to pre-pregnancy levels, but it can take weeks for this to happen, and edema in the hands and feet can also remain for some time. In the first 48 hours after giving birth, blood pressure should be monitored closely (DE PAIVA PINTO et.al, 2022).

Figure 2. Twin pregnancy loss. Source:

2. OBJECTIVES

The aim of this article is to discuss ways of managing twin pregnancies in order to avoid fetal death. Given the increase in the number of twin pregnancies and the risks involved, it is essential to study the complications and characteristics of these pregnancies.

3. MATERIAL AND METHODS

The methodology used was a literature review. The research was carried out by means of an electronic search for scientific articles published on the Scielo (Scientific Electronic Library Online) and Lilacs (Latin American Health Sciences Literature) and Pubmed websites. The health terminologies consulted in the Health Sciences descriptors (DeCS/BIREME) were used: risks and management in twin pregnancies with single fetal death; obstetric risks in multiple pregnancies and approaches to reducing complications; the role of ultrasound in determining chorionicity and amnionicity; twin pregnancies: frequency of pre-eclampsia, gestational diabetes and prematurity; selective growth restriction in monochorionic twin pregnancies.

The inclusion criteria were: original article, published in Portuguese and English, freely accessible, in full, on the subject, in electronic format and published in the last ten years (2010 - 2024) totaling 27 articles.

4. DISCUSSION

Complications such as premature birth, pre-eclampsia, intrauterine growth restriction and gestational diabetes are more common in twin pregnancies. Reducing these complications requires a multidisciplinary and well-coordinated approach, which includes rigorous prenatal monitoring, appropriate medical interventions, nutritional and psychological support for the pregnant woman, as well as specific strategies for birth management (FRANCISCO & CARVALHO, 2015).

The implementation of evidence-based protocols can improve maternal and neonatal outcomes, promoting a safer and healthier pregnancy (ASLAN et.al, 2024).

Multiple pregnancies present significantly higher risks for both mother and fetus. The probability of stillbirth is five times higher in multiple pregnancies compared to single pregnancies, and neonatal mortality is seven times higher, especially when associated with prematurity. The main complications include premature birth, abnormal placentation, restricted intrauterine growth (CIUR), premature rupture of the ovular membranes (RPMO), intrauterine fetal death, gestational diabetes (GDM), pre-eclampsia (PE) and anemia due to the greater demand for folate and iron during pregnancy (COELHO et.al, 2011).

According to Francisco & Carvalho (2015), in monochorionic pregnancies, the risk of miscarriage is significantly high. Specific complications such as feto-fetal transfusion syndrome (FFS) are also more common in monochorionic pregnancies, where blood circulation is shared unequally between the fetuses. Early and continuous medical intervention is crucial for the detection and management of these complications, highlighting the importance of specialized prenatal care.

The specialization of prenatal and childbirth care services can make a significant contribution to reducing fetal and maternal morbidity and mortality. Early detection of complications and appropriate management, through specific protocols and a multidisciplinary approach, are fundamental to improving clinical outcomes. Measures such as intensified monitoring, educating pregnant women about warning signs and preventive interventions can reduce the associated risks (FRANCISCO & CARVALHO, 2015).

The studies by Deveer et.al (2013), reported that the most essential component of fetal well-being in twin pregnancy is the determination of placental chorionicity. Placental physiology has a vital impact on fetal and neonatal outcomes.

Aslan et.al (2024) cites that if egg division occurs 9-12 days after fertilization, it will result in monochorionic monoamniotic twins. The incidence of these twins is only 1%. The increased incidence of second trimester losses, congenital anomalies and prematurity in these twins is well documented.

Due to the existence of a single placenta, monochorionic twins have significant vascular communication between the two fetal circulations. In 80% of cases, the vascular anastomosis is bidirectional, which rarely leads to a hemodynamic imbalance between the fetal circulations, however, it allows a direct vascular connection between the twins with an increased risk of fetal death (FRANCISCO & CARVALHO, 2015).

Deveer et.al (2013), highlights in their studies that in 15% of monochorionic pregnancies, the placenta has a predominance of unidirectional vascular anastomosis that results in twin-twin transfusion syndrome (TTTS). Other morbidities unique to monochorionic pregnancies are; intrauterine growth restriction (sIUGR); twin anemic polycythemia sequence (TAPS); neurodevelopmental morbidity; trap reversal arterial perfusion syndrome (TRAP); the death of a single twin and its effects on the second twin.

FIGURE 3 schematically represents twin formation and its possible complications.

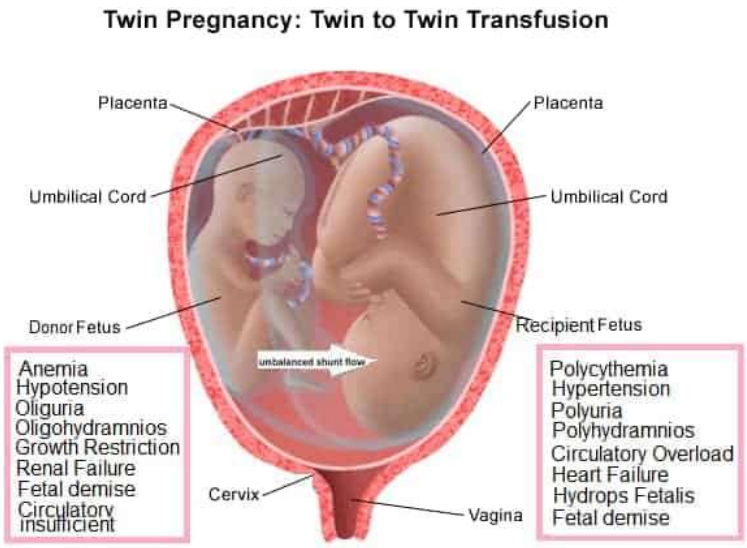

Figure 3. Complications of twin pregnancy. Source: medicoapps.org/multiple-pregnancy-complication-and-management (2024).

According to Carvalho et al (2024), the exact cause of pre-eclampsia has not yet been established. What is known is that it is associated with high blood pressure, which can be chronic or specific to pregnancy. Other possible causes include: autoimmune diseases, blood vessel problems, diet and genes.

Although the exact cause of pre-eclampsia is not known, risk factors have been defined. The likelihood is higher in the first pregnancy or when there is a gap of at least ten years between two pregnancies (CARVALHO et.al, 2024).

According to Jain & Purohit (2014), twin pregnancies are worrying, especially for public health, as they are considered a risk for the fetus and mother. The literature suggests that it can result in neonatal prematurity, low birth weight, fetal malformations and there is also a risk of maternal and fetal mortality and morbidity. Twins show an eight times higher risk of delivery below 32 weeks, a three times higher risk of fetal growth restriction (FGR) and a three times higher risk of neonatal mortality.

According to Louza et.al (2024), selective fetal growth restriction is defined as the fetal weight of one of the fetuses below the 10th percentile for gestational age, and is documented in at least 10% of monochorionic twin pregnancies.

Fetal growth restriction (FGR) occurs in approximately 3 to 10% of singleton pregnancies, in 9.1% of all twins, and in 9.9% of monochorionic twins. The growth deficit can selectively affect only one of the twins (S-FCR). The spontaneous death of the restricted twin can result in the concomitant death or severe neurological impairment of the other twin (FRANCISCO & CARVALHO, 2015).

An important assessment concerns the weight of the fetuses in twin pregnancies. In cases of selective growth restriction, the difference in weight between the fetuses is at least 25%, with one of the fetuses having an estimated weight below 10% for gestational age. It should be remembered that in situations of uncomplicated monochorionic twin pregnancies, ultrasound examinations should be carried out every 15 days (DE FIGUEIREDO ALVES et.al, 2019).

However, once selective growth restriction has been diagnosed, these examinations should be carried out weekly (SANTEMA, 2015).

Regarding vascular impairment in pregnancy, as the state of fetal hypoxia progresses, other fetal vessels such as the middle cerebral artery and ductus venosus also begin to alter their flow. This happens as an adaptive way of the fetus to more extreme hemodynamic conditions. In this way, studies suggest that monitoring during twin pregnancies by assessing the Dopplervelocimetry of the umbilical artery can reduce the risk of perinatal death (PAGE et.al, 2015; ASLAN et.al, 2024).

The loss of one of the fetuses in twin pregnancies is relatively frequent, with a higher risk in monochorionic twins (COELHO et.al, 2011).

If fetal loss occurs after the 16th week of pregnancy, the surviving twin is at increased risk of intrauterine death (ASLAN et.al, 2024).

In monochorionic twins, the risk of neurological sequelae with fetal death can be as high as 25%, and the lesions are the result of acute hypoperfusion immediately after the death of one of the fetuses (PAGE et.al, 2015).

Due to the greater risk of fetal growth restriction, the number of ultrasound examinations required to monitor twin pregnancies should be greater than for single pregnancies. The doctor must be alert to ultrasound changes. Abnormal amniotic fluid

changes, estimated fetal weight less than the 10th percentile, fetal weight discordance (20% or more), presence of malformations and abnormal umbilical artery doppler o (ASLAN et.al, 2024).

5. FINAL CONSIDERATIONS

The follow-up and evolution of these pregnancies will depend on the type of placenta, gestational age and the condition of the surviving twin, bearing in mind that prematurity is also an important cause of neonatal morbidity and mortality with possible neurological sequelae, which can make analysis difficult.

In order to compare the sequelae observed in twin infants, both those resulting from perinatal conditions associated with prematurity and others, such as intrauterine fetal death, a detailed investigation is required during the prenatal period and after birth.

Twin pregnancies are always special. They are always monitored differently and the risks of complications are always higher.

Health professionals should therefore do their utmost to be aware of all possible complications during twin pregnancies.

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