



Preterm delivery in multiple pregnancy

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Abstract

Introduction: Preterm delivery rates have been stable for many years. Improvement in diagnostic and treatment decreases the rates of spontaneous preterm delivery but increases frequency of iatrogenic prematurity.

Aim: The aim of the review was to systematize knowledge about preterm delivery reasons in multiple pregnancies.

Material and methods: Literature regarding preterm delivery in multiple pregnancy was analyzed.

Results and discussion: Preterm delivery is more frequent in multiple pregnancies when compared to singleton gestations. There are many pathophysiological mechanisms of early shortening of uterine cervix, rupture of membranes and uterine contractions leading to delivery. Additional problem is related to multiple pregnancy complications, increasing the risk of both, spontaneous and iatrogenic, delivery.

Conclusions: Multiple pregnancy is a risk factor of spontaneous and iatrogenic preterm delivery.

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1. INTRODUCTION

Preterm delivery is one of the most frequent causes of neonatal mortality and morbidity. It is well known that short cervix, preterm premature rupture of membranes or preterm uterine contractions may lead to early delivery, but the underlying mechanisms are still a little mysterious. Vaginal and intrauterine infections are the best-known factors blamed for triggering processes ending in preterm labor. One of the other, proved to be important factors, involves uterine muscle stretching and functional effects. It may be due to polyhydramnios, fetal macrosomia, but also multiple pregnancy.¹ The review concentrated on the multiple pregnancy and its complications. Some of the described pathologies due to quicker than in normal multiples increase of the uterus are more likely to cause preterm delivery or may be the reasons for iatrogenic prematurity.²

2. AIM

The aim of the review was to systematize knowledge about preterm delivery reasons in multiple pregnancies.

3. MATERIAL AND METHODS

Literature regarding preterm delivery in multiple pregnancy was analyzed.

4. RESULTS AND DISCUSSION

4.1. PRETERM BIRTH IN UNCOMPLICATED MULTIPLE PREGNANCY

Recent decades have witnessed a notable rise in the incidence of multiple pregnancies, primarily attributable to increasing maternal age and the widespread use of assisted reproductive technologies.² Multiple gestations inherently confer a substantially elevated risk of preterm birth. The mean duration of a twin pregnancy is approximately 36 weeks, implying that up to 65% of neonates from such pregnancies are delivered before term, i.e., prior to 37 completed weeks.³ Each additional fetus further abbreviates gestational length; while deliveries beyond 37 weeks occasionally occur in triplet pregnancies, they remain exceptional, and term delivery in higher-order multiples is virtually absent.²

Preterm birth in otherwise uncomplicated multiple gestations is driven by two principal pathophysiological mechanisms associated with accelerated uterine enlargement and markedly increased uterine volume compared with singleton pregnancies. These include stimulation of uterine contractility, precipitating labor, and progressive cervical shortening secondary to isth-

mic-cervical insufficiency induced by excessive uterine distension, even in the absence of contractions. Although premature rupture of membranes is more frequent in multiple pregnancies, this mechanism appears less pivotal in determining preterm birth.²

Furthermore, in multiple gestations – particularly those characterized by shared chorionicity or amnionicity – the risk of unpredictable intrauterine fetal demise escalates considerably earlier than in singleton pregnancies. Consequently, current recommendations advocate elective delivery prior to 37 weeks, either by induction or cesarean section. An extreme example of iatrogenic prematurity is the recommendation for cesarean delivery of monoamniotic pregnancies between 32 and 34 weeks of gestation.⁴

4.2. PRETERM BIRTH ASSOCIATED WITH MATERNAL COMPLICATIONS IN MULTIPLE GESTATIONS

Maternal complications in multiple pregnancies can further amplify the risk of preterm birth. This primarily concerns conditions typical of monochorionic gestations; however, other pathologies – also observed in singleton pregnancies – occur with significantly greater frequency in multiple gestations.²

For instance, polyhydramnios secondary to uncontrolled diabetes may involve two amniotic sacs, accelerating uterine volume expansion compared to singleton pregnancies. This rapid increase predisposes to uterine contractions, premature rupture of membranes, or cervical shortening. Clinical manifestations of polyhydramnios – such as dyspnea, edema, malaise, and pain – also appear earlier, often necessitating amnioreduction, which itself carries a risk of preterm delivery.⁵

Patients with cholestasis, gestational hypertension, intrauterine growth restriction, or HELLP (hemolysis, elevated liver enzymes and low platelets) syndrome face an elevated risk of both iatrogenic and spontaneous preterm birth. In such cases, premature termination of pregnancy may be indicated to safeguard maternal and/or fetal health. The cumulative effect of these complications, combined with the inherent predisposition of multiple gestations to preterm delivery, substantially increases the proportion of infants born prematurely.⁶

4.3. FETAL COMPLICATIONS IN DICHORIONIC TWIN PREGNANCIES

A distinctive feature of complications in dichorionic twin pregnancies is that the threat to fetal health or survival typically concerns only one fetus, while the co-twin is usually healthy and does not require early delivery. This scenario complicates considerations

regarding iatrogenic preterm birth, as interventions aimed at saving the compromised fetus often occur at the expense of the healthy twin.

In cases where delivery of the affected fetus – such as in severe fetal growth restriction (FGR) – offers a greater chance of survival compared to continuing the pregnancy, clinicians face the dilemma of exposing the co-twin to extreme prematurity, with associated risks of neonatal death, severe neurological injury, and other complications.⁷ The decision to intervene, balancing the potential benefit for one fetus against the harm to the other, is profoundly challenging. For expectant parents, witnessing the demise of one fetus to preserve the life and well-being of the other is emotionally overwhelming and frequently unacceptable.

4.4. COMPLICATIONS SPECIFIC TO MONOCHORIONIC TWIN PREGNANCIES

An entirely different clinical scenario involves complications characteristic of monochorionic twin gestations. Similar to previously described situations, these conditions may precipitate both spontaneous preterm labor and planned, iatrogenic preterm delivery. Given that more than 40% of monochorionic twin pregnancies are affected by severe pathologies associated with a shared placenta, the clinical significance of this issue is considerable.²

TWIN-TO-TWIN TRANSFUSION SYNDROME (TTTS)

The first complication characteristic of monochorionic twin pregnancies is Twin-to-Twin Transfusion Syndrome (TTTS), which occurs in approximately 10–15% of such gestations. In TTTS, the donor twin becomes hypovolemic, with reduced amniotic fluid volume, and is at risk of intrauterine demise due to severe anemia and hypoxia. Conversely, the recipient twin, hypervolemic and affected by polyhydramnios, develops cardiac failure that may also result in death.

A third critical aspect in TTTS management is the rapid increase in uterine volume caused by severe polyhydramnios in the recipient twin. This expansion significantly heightens the risk of uterine contractions, premature rupture of membranes, and cervical shortening, all of which predispose to spontaneous preterm birth. When TTTS develops before fetal viability, intrauterine therapy – preferably fetoscopic laser ablation of placental anastomoses – is recommended.⁸ Although these procedures carry a substantial risk of complications, including preterm delivery, they remain the treatment of choice due to their effectiveness in reducing the risk of fetal demise and preterm labor associated with rapid uterine enlargement.⁵

Regardless of the chosen intervention, when imminent intrauterine death of either twin occurs after 26 weeks of gestation, delivery may be considered. Such decisions should involve a multidisciplinary team, including neonatologists, as outlined in the section on iatrogenic preterm birth. The presence of a second, less compromised twin complicates decision-making, as both fetuses will be exposed to the risks of prematurity. Ultimately, the decision rests with the patient; however, the manner in which clinicians communicate potential scenarios and consequences of prematurity profoundly influences parental choices.

SELECTIVE FETAL GROWTH RESTRICTION (sFGR)

The second complication, as frequent as TTTS, is selective fetal growth restriction (sFGR). In monochorionic twin pregnancies, the presence of oligohydramnios and severe circulatory compromise in the growth-restricted fetus poses a significant challenge in determining the optimal timing of delivery. Clinicians must balance the need to prevent intrauterine demise of the compromised fetus against minimizing the risks of prematurity for the normally grown co-twin, who remains unaffected until fetal death occurs.^{2,7}

Monochorionic pregnancies present a very complex scenario. Demise of the growth-restricted twin may trigger acute hemodynamic shifts through placental vascular anastomoses, resulting in transfusion to the deceased fetus and catastrophic consequences for the surviving twin, including death, severe neurological injury due to abrupt hypotension, or profound anemia. Preventive fetoscopic laser ablation of intertwin vascular connections in high-risk sFGR cases has been explored; however, outcomes differ only marginally from the natural course of such pregnancies, likely due to the technical complexity and high complication rates of these procedures compared to TTTS interventions.

Additionally, concerns have been raised regarding potential neurological injury in the normally grown twin, attributable to hemodynamic disturbances transmitted via vascular connections during the period when both fetuses remain alive.⁸

TWIN ANEMIA-POLYCYTHEMIA SEQUENCE (TAPS)

Twin Anemia-Polycythemia Sequence (TAPS), another complication of monochorionic twin pregnancies, occurs far less frequently than TTTS or sFGR and often arises as a sequela of fetoscopic treatment for these conditions. It is caused by small, frequently invisible during fetoscopy, communicating vessels, where blood flow from one fetus to another is not large enough to cause TTTS, but leads to anemia in one and poly-

cythemia in the other twin. Fortunately, only a minority of cases progress to a severity that threatens fetal health or survival. In advanced stages, arterial thromboembolism may develop in the polycythemic recipient, while profound anemia in the donor can lead to neurological injury or intrauterine demise.

Management strategies for severe TAPS include intrauterine interventions such as laser ablation of vascular anastomoses, intrauterine transfusion, or partial exchange transfusion. However, consensus regarding the most effective therapeutic approach remains lacking.^{5,9} Each intervention carries inherent risks, necessitating careful consideration of potential intrauterine complications and determination of the optimal timing for delivery. As with other monochorionic complications, clinicians must weigh the risks of continuing pregnancy against the consequences of prematurity for both fetuses.

TWIN REVERSED ARTERIAL PERFUSION SEQUENCE (TRAP)

Twin Reversed Arterial Perfusion (TRAP) sequence represents another severe complication of monochorionic twin pregnancies. The presence of an acardiac twin imposes a significant hemodynamic burden on the pump twin, ultimately leading to progressive cardiac volume overload and heart failure. Polyhydramnios, frequently associated with TRAP, may precipitate spontaneous preterm labor; however, more commonly, the need for iatrogenic preterm delivery arises due to imminent risk to the pump twin's survival.

Cardiac failure and profound anemia in the pump twin may result in non-immune hydrops fetalis and, consequently, maternal mirror syndrome – both constituting indications for delivery in a short time from diagnosis. Current guidelines recommend intrauterine intervention upon TRAP diagnosis in the first trimester, irrespective of the size of the acardiac twin. Fetoscopic laser coagulation of vascular connections supplying blood from the pump twin to the acardiac twin is considered the treatment of choice. Successful ablation significantly reduces hemodynamic strain and allows continuation of pregnancy to term.⁵

4.5. DELAYED DELIVERY

A particularly distinctive scenario in multifetal pregnancy is delayed delivery. This occurs when one fetus is delivered extremely prematurely, after which uterine contractions spontaneously subside, allowing the other fetus to remain in utero. Management in such cases may follow two opposing strategies: either inducing uterine activity to complete the delivery or, conversely, suppressing contractions to prolong gestation of the remaining twin or additional fetuses.¹⁰

In patients where the first fetus is born at a gestational age with negligible or no chance of survival – and where the risk of severe prematurity-related complications is high – extending the latency period for the second twin significantly improves its prospects for survival and normal development. The prerequisites for maintaining pregnancy after the birth of the first fetus include the absence of intrauterine infection and no signs of fetal compromise. Risk of fetal compromise or event death and maternal infection including sepsis are the hazards of delaying delivery of the second twin. Physicians rarely opt for this approach once the amniotic membranes of the second twin have broken; however, when the membranes remain intact, continuation of pregnancy is feasible.

Recommended interventions include prophylaxis against uterine contractions immediately following delivery of the first fetus (tocolysis), antibiotic prophylaxis – typically following protocols for preterm premature rupture of membranes, and close monitoring of fetal well-being and infection markers. Achieving a prolonged latency period is generally easier in twin pregnancies, though successful outcomes have also been reported in higher-order multiples, such as triplets or quadruplets. Even a delay of several days during certain gestational stages can markedly improve prognosis; under favorable conditions, pregnancy may be extended by several weeks or even months.^{10,11}

5. CONCLUSIONS

Multifetal pregnancies are associated with a significantly higher incidence of preterm birth compared to singleton pregnancies. Some of these are spontaneous, triggered by premature onset of uterine contractions, rupture of membranes, or cervical shortening. However, the most challenging scenarios often involve conditions affecting one fetus that threaten its health or survival, while the co-twin remains healthy and developing normally. In such cases, clinicians face a critical dilemma: whether to intervene to save the compromised fetus at the expense of exposing the healthy twin to the risks of prematurity, or to prioritize the well-being of the healthy fetus, potentially sacrificing the other.

The decision to initiate an iatrogenic preterm delivery in a twin pregnancy is particularly difficult for expectant parents, who may ultimately face lifelong consequences if both children suffer from disabilities as a result of this choice.

CONFLICT OF INTEREST

None declared.

FUNDING

None declared.

ETHICS

Not applicable.

REFERENCES

- ¹ Goldenberg R, Culhane J, Iams J, Romero R. Epidemiology and causes of preterm birth. *Lancet*. 2008;371(9606):75–82. [https://doi.org/10.1016/s0140-6736\(08\)60074-4](https://doi.org/10.1016/s0140-6736(08)60074-4).
- ² Bręborowicz G, Malinowski W, eds. *Multiple pregnancy* [in Polish]. Warszawa: PZWL. 2022. <https://doi.org/10.53270/2022.007>.
- ³ Seetho S, Kongwattanakul K, Saksiriwuttho P, Thepsuthammarat K. Epidemiology and factors associated with preterm births in multiple pregnancy: a retrospective cohort study. *BMC Pregnancy Childbirth*. 2023;23(1):872. <https://doi.org/10.1186/s12884-023-06186-0>.
- ⁴ Wielgoś M, Bomba-Opoń D, Bręborowicz G, et al. Recommendations of the Polish Society of Gynecologists and Obstetricians regarding caesarean sections. *Ginekol Pol*. 2018;89(11):644–657. <https://doi.org/10.5603/GP.a2018.0110>.
- ⁵ Kosiński P, Borowski D, Brawura-Biskupski-Samaha R, et al. Fetal therapy guidelines of the Polish Society of Gynecologists and Obstetricians – Fetal Therapy Section. *Ginekol Pol*. 2024;95(4):285–315. <https://doi.org/10.5603/gpl.100108>.
- ⁶ Bręborowicz G. *Obstetrics* [in Polish]. Warszawa: PZWL. 2020.
- ⁷ Kosińska-Kaczyńska K, Torbe A, Kwiatkowski S, et al. The Polish Society of Gynecologists and Obstetricians guideline for the diagnostic assessment and management of multiple-gestation pregnancy complicated by fetal growth restriction. *Ginekol Pol*. 2022;93(3):256–263. <https://doi.org/10.5603/GP.a2021.0244>.
- ⁸ Buskmiller C, Munoz J, Sanz Cortes M, Donepudi RV, Belfort MA, Nassr AA. Laser therapy versus expectant management for selective fetal growth restriction in monozygotic twins: A systematic review. *Prenat Diagn*. 2023;43(5):687–698. <https://doi.org/10.1002/pd.6348>.
- ⁹ Da Silva Rocha J, Guedes-Martins L, Cunha A. Twin Anemia-Polycythemia Sequence (TAPS): From Basic Research to Clinical Practice. *Curr Vasc Pharmacol*. 2023;21(2):91–105. <https://doi.org/10.2174/1570161121666230131112930>.
- ¹⁰ McDonnell BP, Martin A. Delayed interval delivery of preterm multiples: experience from a large specialized twin center. *J Matern Fetal Neonatal Med*. 2022;35(12):2227–2233. <https://doi.org/10.1080/14767058.2020.1782375>.
- ¹¹ De Frias CAS, Queirós ASPAF, Simões HTF. Delayed-Interval Delivery in Dichorionic Twin Pregnancies: A Case Report of 154 Latency Days. *Rev Bras Ginecol Obstet*. 2020;42(1):61–64. <https://doi.org/10.1055/s-0040-1701468>.