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Incidences of Twin Pregnancies, Fetal Outcomes and Complication Affecting the Mother in AL-Gomhori Hospital in Taiz, Yemen

Rasha Murshed Said Nagi
rashamurshed641@gmail.com

Dr. Gabel Al-Tayeb Mohammed
Associate professor of Obstetrics and Gynecology
Faculty of Medicine, Aden University
gabelaltayeb@gmail.com

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Rasha Murshed Said Nagi

Dr. Gabel Al-Tayeb Mohammed
Associate professor of Obstetrics and Gynecology
Faculty of Medicine, Aden University

Abstract

Background

Multiple pregnancies are much more common today than they were in the past. Twin pregnancies occur in about 4% of pregnancies in some countries. Adverse pregnancy outcome was more common in twin pregnancy than in singleton pregnancy.

Study Objectives

The study generally aims to highlight the incidence of twin pregnancies in Al Gomhori hospital, Taiz, Yemen over a year (from Oct 1st 2024 to Sep 30th 2025)

Study Design

A prospective observational study.

Subjects and Methods

A questionnaire was constructed to collect data about each woman admitted to the hospital with twin pregnancies. The questionnaire included the important data about the mothers, such as age, parity, associated factors of twin pregnancy, antenatal healthcare, complications during pregnancy and delivery, gestational age at delivery, mode of delivery, and the condition of the mothers and the newborns after delivery. The data were collected and analyzed using SPSS software.

Results

The study found that 115 women gave birth to twins, resulting in the incidence of twin pregnancy as 1.3% in the hospital. The majority of these women (37.3%) were multipara. Their mean age was 29.16 ± 5.4 years, ranging from 18 to 40 years. A previous personal twin pregnancy accounted for 8.4% of the women, while a family history of twin pregnancies was

present in 67.8% of the maternal side and 15.7% paternal side. Obesity was present among these women (20.9%). A total of 97.3% of the women had received prenatal care, while only three women did not attend antenatal care. Maternal complications included anemia (60.8%), premature birth (53.9%), urinary tract infections (29.5%), preeclampsia (9.5%), and polyhydramnios (8.7%). The most common complication during delivery was rupture of membranes (10.4%), and postpartum complications included postpartum hemorrhage (7.8%) and retained placenta (3.4%). Smoking was not significantly associated with preterm birth, but khat use had a statistically significant effect ($P < 0.001$). The rate of cesarean section reaching 44.3%, the most common indication being non- cephalic presentation of the first twin. The most common fetal complications were premature birth and its consequences (53.9%), fetal injury (6.9%) twin discordance (16.5%), and others. The study did not observe any differences in the Apgar score at five minutes between the first and second twins. Seven of the first twins and seven of the second twins were stillborn. The mean birth weight of the first twin was 2157.86 ± 638.1 grams, and the mean birth weight of the second twin was 2071.40 ± 623.3 grams. The perinatal mortality was 73.91 per 1000 births

Conclusion

The incidence of twin pregnancy in the hospital observed in this study is 1.3% similar to the global incidence. The majority of women were multiparous and the incidence of twin pregnancy increased with increasing maternal age. Twinning was detected more among women with family history particularly along the maternal side. The majority of twin pregnancies were diagnosed during antenatal care. Anemia, premature birth, urinary tract infection, preeclampsia, polyhydramnios, pressure symptoms, PROM, and PPH were the most frequent maternal complications. The rate of cesarean section was lower than that of vaginal delivery with no combined mode of delivery for the second twin. The commonest indication of the cesarean section was non-vertex presentation of the first twin followed by prior scar. Prematurity, discordance, fetal demise, and congenital anomalies were the most frequent fetal complications. The mean birth weight for the first twin was higher than the second one with no statistical difference between the first and second twin in relation to Apgar score at 5 minutes.

Introduction

Multiple pregnancy occurs because of the in utero development of two or more fetuses at the same time. Multiple pregnancies are associated with increased risk to both the mother and fetuses and this risk increases with the number of fetuses [1]. Though the incidence rate appears to be variable, multiple pregnancies account for 3-4 % of births globally. Twin pregnancy is a major challenge in obstetric practice [2]. Sub-Saharan Africa has the highest incidence of multiple pregnancy, with an average twinning rate of 20 per 1,000 deliveries whereas it is 10 per 1,000 deliveries in Europe and about 5-6 per 1,000 deliveries in Asia [1, 3]. Complex interaction between various genetic and environmental determinants like maternal obesity, age, multiparity, family history, race and other social factors results in twin pregnancy and occurs in 2-4 of live births [4]. These rates of multiple pregnancies have a direct effect on the rates of preterm deliveries and its associated complications. The risks of congenital malformations are also high with multifetal pregnancies. The incidence of multiple pregnancy had raised by more than 70% over the last three decades due to the emergence of various infertility treatment modalities [5]. Women's desire to give birth to more than one baby and transfer of multiple embryos to achieve higher live births has led to an increase in twin pregnancy rates. More than 20% of pregnancies that resulted from assisted reproductive techniques are multiple pregnancies [6]. There is significant variation in the incidence of multiple pregnancies among populations of different countries, due to variations in the frequencies of dizygotic twinning. The increase in the levels of follicle stimulating hormone in multiple ovulation results in dizygotic twins. Monozygotic twinning rate is relatively constant [7]. The outcome of monozygotic twinning process depends on when the division occurs. Among twin pregnancies, monochorionic (MC) twins have worse pregnancy outcomes compared to dichorionic (DC) twins, irrespective of the mode of conception. Also, the perinatal outcome is worse in monochorionic twins conceived through assisted reproductive techniques when compared with monochorionic twins conceived spontaneously [8]. Some vascular anastomotic connections are likely to exist in all monochorionic placentas. The anastomosis may be artery-to-artery, artery to-vein or vein-to-vein and whether the anastomoses are dangerous to either twins depends on the degree to which they are

hemodynamically balanced. The resulting chronic feto-fetal circulation may lead to complications that are unique to monochorionic twins such as twin to twin transfusion syndrome (TTTS) and twin anemia-polycythemia sequence (TAPS). These explain the increased risk of perinatal morbidity and mortality in monochorionic twins compared with dichorionic pregnancy [9]. Discordant growth of twin fetuses, with growth restriction in one twin (selective fetal growth restriction) occurs in 10-15% of monochorionic twin gestations and represents a challenges in management [10]. Studies have shown that growth is lower in DC twins from 30 weeks of gestation compared to singleton pregnancies and growth of MC twins is smaller when compared to both singleton and DC twins, throughout the gestation [11]. Approximately 60% of twins will deliver spontaneously before 37+0 weeks of gestation [12]. Congenital malformations, low-birth weight, birth asphyxia, intrauterine fetal death are few reasons for high mortality, contributing to increased perinatal complications such as post-partum hemorrhage, preeclampsia and preterm birth [13]. Standardization of the criteria for diagnosis, improving the monitoring and management protocols and proper reporting of the outcome are likely to reduce the perinatal risks [14].

Problem Statement

The incidence of twin pregnancies and their associated health risks constitute a significant yet poorly quantified challenge to maternal and neonatal health services in Taiz, Yemen. At a population level, twin births are expected to rise in low-income countries such as Yemen due to projected shifts in maternal age structure [1]. Twin pregnancies are high-risk, leading to higher rates of complications such as preterm birth and low birth weight (LBW) [2]. In the context of Taiz, where the healthcare system is severely strained by conflict and one hospital was documented to be operating 50% beyond its intended capacity [3], even a small increase in complex cases like twin births could critically overwhelm services. Currently, the absence of baseline data on twin pregnancy incidence at Al Gomhori Hospital hinders effective planning for the resource allocation, staff training, and the development of specialized care protocols to mitigate risks for this vulnerable group.

Justification

Conducting this study is justified for several compelling reasons:

- **Public Health Planning:** The findings will provide the first crucial data on the scale of twin pregnancies in a key Taiz hospital, informing strategic plans for obstetric and neonatal care.
- **Resource Allocation**: Evidence on the number of twin births can help hospital administrators anticipate the need for specialized equipment, neonatal intensive care unit (NICU) spaces, and blood bank supplies [4].
- **Improving Outcomes:** Twin births are associated with higher perinatal mortality rates [5]. Understanding their local prevalence is the first step toward implementing targeted interventions to save lives.
- **Addressing a Growing Need:** Research indicates that twinning rates are expected to increase in most low-income countries in the coming decades [1]. This study will position Al Gomhori Hospital to proactively address this future challenge.
- **Context of Crisis**: With over 882,000 women in Yemen receiving safe delivery care from humanitarian partners in a recent reporting period [6], generating precise local evidence is key to ensuring that aid is effective and reaches the most vulnerable, including mothers with multiple births.

Significance of the Study

"The purpose of this research is to explore the incidence and outcomes of twin pregnancies in Taiz, Yemen, given the lack of previous studies on this subject in the area

Twin pregnancies are inherently high-risk, with increased rates of preterm birth, low birth weight, gestational diabetes, preeclampsia, and cesarean delivery compared to singleton pregnancies. By analyzing outcomes such as maternal morbidity, neonatal survival, and long-term health complications, this study will:

- Identify risk factors specific to twin pregnancies in the study population.
- Guide healthcare providers in tailoring prenatal care and delivery protocols to reduce adverse outcomes.
- Empower expectant mothers with evidence-based information for informed decision-making.
- Reduce maternal and fetal mortality

Research Question

Q1: What is the incidence rate of twin births and fetal outcomes?

Q2: What are the Risk factor affecting mother pregnancies?

Objectives of the Study

General Objective

The study generally aims at highlight the incidence of twin pregnancies and improving outcomes in Taiz, Yemen given the lack of previous studies on this subject in the area.

Specific Objectives

1. To determine the incidence of twin pregnancies.
2. To assess the main antepartum and intrapartum complications affecting the mother and her twins pair
3. To assess the association of various related demographic, gynecologic and obstetric factors associated with twin pregnancy (maternal age, parity, gestational age, previous history of twins, family history of twins, drug history and body mass index)
4. To observe the effect of antenatal care utilization in the outcome of twin pregnancy

Additional objectives:

1. To partially fulfill the requirement of obtaining a Master Degree in Obstetrics and Gynecology in Taiz University.
2. To reduce the maternal morbidity and fetal mortality which occurring in twin pregnancies.

Subjects & Methods

Study Design

This was a prospective observational study.

Study setting

This study was carried out at Al Gomhori Hospital which is the largest public hospital, affiliated to Taiz University and serves patients from all governorate. The hospital consists the Pediatric and Neonatology department; the Obstetrics and Gynecology department; the internal medicine, surgery and Dermatology departments.

Study Population

The study population includes all twin pregnancies in women who attended Al-Gomhori Hospital for delivery after 20 weeks of gestation.

Inclusion Criteria

- All twin pregnancies with a gestational age of more than 20 weeks were included in the study.

- Pregnant women of any age.
- Any Parity.

Exclusion Criteria

- Singleton pregnancies.
- Triplet or higher order pregnancies.
- gestational age less than 20 weeks. Pregnancies

Sample size calculation

The study sample included all twin pregnancies during the study period who attended and were managed at the hospital.

It was a convenient sample size and included 115 women.

Data collection

The data were collected directly by the author, from the patients who delivered twins, from the patient's relatives, and from the case sheet. A questionnaire was designed for the purpose of this study (annex 1). Each mother was asked to compilete to answer an independent questionnaire. All questionnaires were kept by the author, throughout the data collection period. The data included in the questionnaire were maternal age; current residenci; parity; previous preterm delivery; antenatal care visits; previous history of twins; family history of twins; or ovulation induction therapy in this pregnancy; history of one month stoppage of prolonged use (more than 6 months) of contraceptive drugs; body mass index (BMI) (when the height and pregravid weigh is known); hemoglobin level, and Rh grouping; the study also focused on the mode of delivery, sex of the neonate and their weights, Apgar scores; the first and fifth minutes number of placentas and membranes; with particular focus on maternal and fetal complication.

Data analysis

Data were analysis processed using Statistical Package for Social Science (SPSS) version 24

Quantitative variables were presented as mean +_ SD while qualitative variables were presented as frequencies and percentages.

Results

In this study, 115 twin pregnancies were registered in Al–Gomhori Teaching Hospital – Taiz Governorate, in during the period from Oct 1st 2024 to Sep 30th 2025. These twin deliveries represent an incidence of 1.3% of the

total hospital deliveries (8978 deliveries) during the same of study period. (See table 1).

Table (1):

Incidence of twin pregnancies at AL Gomhori hospital Taiz city (10-12) 2024-(1-9) 2025

Hospital deliveries	No	%
Singleton deliveries	8863	98.7
Twin deliveries	115	1.3
Total deliveries	8978	100
Incidence of twin	115	1.3

Table (2):

Distribution of twin pregnancies by their maternal complications

Maternal Complications	Twin deliveries (n=115)	
	№	%
* Ante partum:		
- Anemia	70	60.8
-Preterm delivery	62	53.9
- Hyperemesis gravidarum	7	6.0
-Urinary tract infection	34	29.5
-Preclampsia-eclampsia syndrome	11	9.5
- Pressure symptoms	7	6.0
-Polyhydramios	10	8.7
- Abruptio placenta	1	0.86
-Placenta previa	0	0
-Gestational hypertension	5	4.3
* Intra partum:		
- Premature rupture of membrane	12	10.4
- Ruptured uterus	0	0
* Post partum:		
- Post partum haemorrhage	9	7.8
- Retained placenta	4	3.4

Table (3):

Distribution of twin deliveries accurding to Mode of delivery by presentation of the first and second twins

Order of twin	Mode of delivery	Presentation							
		Cephalic		Breech		Transverse		Total	
		No.	%	No.	%	No.	%	No.	%
Twin one	Vaginal	46	71.9	18	28.1	0	0	64	55.7
	Cesarean	19	37.2	9	56.8	3	5.9	51	44.3
	*Total	65	56	47	40.9	3	2.6	115	100
Twin two	Vaginal	34	53.1	29	45.3	1	1.6	64	55.7
	Cesarean	22	43.1	24	47	5	9.8	51	44.3
	*Total	56	48.7	53	46	6	5.2	115	100

Table (4):

Fetal complications in twin pregnancies

Fetal complication	Twin pregnancy (n=115)	
	№	%
Prematurity	62	53.9
Birth trauma	8	6.9
fetal demise	7	6.0
Retained second twin	2	1.7
Discordance	19	16.5
Congenital anomaly	6	5.2

Table (5):

Perinatal mortality in relation to antenatal care utilization

Antenatal care:	Total	Perinatal death	Survival	P-value
User	224	14	210	<0.05
Non user	6	3	3	
Total	230	17	213	OR 15

The risk of perinatal deaths was increased among non-users of antenatal care seriously, about five folds with significant statistical difference ($P < 0.05$). The perinatal mortality rate of both twins was 73.91 per 1000 births

Discussion

This study aimed to investigate the incidence of twin pregnancy among women attending Al-Gomhori Hospital, Taiz governorate. Twin pregnancy is often associated with multiple adverse outcomes, both maternal and perinatal. The present study found that the incidence of twin pregnancy in this single center was 1.3 %. The incidence of twinning varies greatly across different parts of the world. It is reported that twin pregnancy occurs in about 0.6% of all pregnancies in Asia, 1-2% in Australia, Europe and in the United States and about 4% in Africa [15]. A study from Bangladesh by Naznin et al [16] reported the incidence of twin pregnancy as 1.47%. The incidence is low in Japan as 1.3 per 1000 birth, and 49-53 per 1000 birth in Nigeria [17]. In Europe and the United States, the typical twin birth rate ranges between 9 and 20 per 1000 births. Such variation could underscore the influence of geographical and genetic factors in twin birth. There is evidence in the literature that the incidence of twin pregnancy has increased greatly in the recent decades mainly due to the increasing use of assisted reproductive technology (ART), use of ovulation drugs, and increasing maternal age during conception [18]. The incidence found in our study is within the global range of twinning 1-3% [16]. However, the low figure observed in our study compared to Gupta et al [19] and Uprate et al [20] as 1.8% and 1.9% respectively could be explained partly by low rate of ART use in our society as well as lower maternal age at conception due to the fact that early marriage and early pregnancy are still common in Yemen society. The present study found that the twinning was significantly more common at maternal age ≥ 30 years old and the rate of twinning decreased with decreasing maternal age. This finding is similar to another study by Monmalar et al [21] from India which reported that the mean maternal age was 26.6 years and Zanjad et al [22] which found that the mean age of women of mean age of was 29.45 ± 4.01 years closely similar to our results.

Regarding the distribution of age group, the present study found that the age group ≥ 30 years accounted for nearly half of the study population (49.5/%), while 46.9% belonged to the 20-30y age group.

This result contrasts with the study from India by Harika et al [23] which reported that a higher incidence of twin pregnancy was detected among the age group of 20-30 years (63.9%) followed by the age group > 30 years

(28%). It's obvious that the maternal age between 20-30 years is the peak reproductive age group when often obstetrical complications happen. Another study by Parvia et al [17] reported that the age group between 20-30 years was the most frequent group for twin pregnancy. However, the slight discrepancy with the above studies could be attributed to difference in sample size. It should be remembered that the risk of twin pregnancy increases with advanced maternal age [24]. Therefore, twin pregnancy should be looked for among women with advanced maternal age (AMA). The present study found that the incidence of twin pregnancy was higher among multiparous women (37.3%) followed by pluripara (para 1-2) with a rate of 34.8%.

These results are consistent with the study by Harika et al [23] which reported that multigravida women constituted the majority of women with twin pregnancies (61-83%). Another study [25] by Smith K reported that multiparous women accounted for 51.2% of women with twin pregnancy. These findings are comparable to our results. It is clear that in most cases the parity perhaps follows the maternal age thus the chance of twining increases with increasing parity. The present study found that the personal history of twin pregnancy was present among eight women (8.4%) and family history of twin pregnancy was positive among 67.8% on the maternal side and 15.7% on the paternal side. These findings underscore the importance of genetic predisposition, particularly through familial inheritance in twin pregnancies. Fraternal (dizygotic) twins are known to have a hereditary component. There is evidence that women with a close relative who had fraternal twins are twice as likely to conceive twins themselves [26]. A study published by UT Southwestern Medical Center explained that identical (monozygotic) twins do not run in families, as their occurrence is random and not influenced by genetics [27]. The Centers for Disease Control and Prevention (CDC) reports that twins account for 31.2 per 1,000 live births in the U.S., with fraternal twins being more common than identical ones [27,28]. A large-scale study published by MIT Press, analyzing 17 million births across 72 countries, found that maternal health and prenatal conditions also significantly influence twin births, even among women not using fertility treatments [28]. The present study found that only two women (1.7%) had ovulation induction and only one woman had stopped chronic use of contraception one month prior to conception. This indicates that the twinning observed in our study were

represented natural twinning not driven by ovulation inducing drugs. With regard to antenatal care visits, the present study found that 97.3% had attended antenatal care visits and only 2.6% had no antenatal check-up at all. This finding is consistent with other studies from different settings. Patidar et al [18] The high ANC utilization rate (97.3%) in this study may be attributed to the hospital-based design, as women attending healthcare facilities are more likely to follow antenatal care. The urban setting also provides better access to services compared to rural areas. Additionally, support from organizations and improved health awareness among women may have contributed to this high rate despite the ongoing conflict.

Regarding Maternal complications during pregnancy, the present study found that the commonest complication was anemia which affected 60.8% of the study population, followed by urinary tract infection (UTI) that occurred in 29.5%, preterm delivery (53.9%), preeclampsia (9.5%), polyhydramnios (8.7%) and others (table 9). In addition, the most frequent intrapartum complication was premature rupture of membranes (PROM) (10.4%). These results are supported by previous studies on twin pregnancy outcomes. Patidar et al [18] reported in their study that maternal anemia was detected among 60.8% similar to ours, hypertensive disorders (24%), polyhydramnios (1.6%), PROM (20%), preterm labor (76%), among others. The study of ponmalar et al [21] reported that preterm labor was the commonest complication representing 48% followed by anemia (34%), hypertensive disorders (30%), polyhydramnios (16%), UTI (12%) among others. The discrepancy in frequencies between the studies could be attributed to the differences in sample size. There is evidence in the literature that anemia is the most frequent complication of twin pregnancy due to the increasing demand for iron, vitamin B12, folate, and physiologic anemia [29]. The incidence of PROM was 10.4% in our study population. It is reported in a study of Patidar et al [18] that the incidence of PROM was 20%, while Singh et al [130] reported the incidence as 10.8% which is very close to our results. The high rate of UTI in our study is comparable to the above-mentioned studies which could be related to the bulky gravid uterus with its pressure effect on the ureters. Post-partum maternal complications observed in this study were post-partum hemorrhage (PPH) which was seen in 7.8% and retained placenta in 3.4%. Another study [21] found that PPH was present in

4%, while the study conducted by Harika found that the incidence of PPH was 36.5%. Another study by Patidar et all [18] reported the incidence of PPH was 8%. The variation within these studies could be related to other confounding factors acting as independent risk factors. The high rate of preterm labor found in this study is in agreement with other studies [15,16]. It could be related to the overdistension of the gravid uterus causing continuous pressure on the cervix leading to early dilation and effacement. The present study revealed that the rate of cesarean delivery was 44.3% while vaginal delivery accounted for 55.7%. There was no difference in the cesarean section rate between the first and second twins suggesting that no retention of the second twin necessitated cesarean section for the second twin. The indications for cesarean section in this study were categorized into indications related to twins (66.7%) and obstetrical indications (33.3%). The commonest indication among the first category was non vertex presentation of the first twins followed by the risk of interlocking while a previous cesarean scar was the leading indication of cesarean section in the second category. The low rate of cesarean section detected in our study is favorable. In contrast, cesarean section was reported to be the predominant mode of delivery in 72% in the study by ponmalar et al [21]. On the other hand, Safrai N et al [31] reported that 88.3% of twin pregnancies underwent vaginal delivery whereas only 7.1% underwent cesarean section and 6.4% had a combined mode of delivery. The fetal complications observed in our study were prematurity, discordance, birth trauma and single fetal demise. Those with dead fetal syndrome were diagnosed during labor in which they delivered stillborn babies. Our study found that the overall perinatal mortality was 73.91 per 1000 births The reported incidence of perinatal mortality was 3.8% by Yadav et al and Rani et al (1.4%) [32]. Perinatal mortality in twins is known to be higher than in singleton pregnancies. There is a study that identified perinatal mortality (14%), stillbirth (30%), and neonatal mortality (12%) among twin pregnancies in Eastern Africa. This high mortality may be attributed to immaturity and twin-related factors as suggested by previous studies [25]. Increased perinatal and obstetric complications among twins could be other contributing factors to the elevated mortality rates. The present study could not find any significant difference between the first and second twins in relation to Apgar score at 5 minutes. This could suggest the smooth course of the second twin delivery. The prevalence of very low birth weight

(<1500g) was 15.5%, low birth weight (LBW) (2500-2000) was 51.3% and the birth weight ≥ 2500g was almost a third of cases (33%) Parvin et a1[17] reported that very low birth weight accounted for 46%, low birth weight had the same percentage (46%) while the normal birth weight was only 40% The VLBW and LBW in twin pregnancy not only necessitate immediate intensive care but are also associated with long-term health issues [17].

Summary

This study aimed to assess incidences of twin pregnancies and maternal, fetal outcomes among pregnant women in Taiz, Yemen. A prospective observational study was conducted in a single hospital, including (115) pregnant women. Data were collected on antenatal care utilization, maternal complication, and pregnancy outcomes. The findings showed a high antenatal care (ANC) utilization rate of 97.3%. the rate of preterm birth was (53.9%), and common maternal complication included anemia, urinary tract infection, and other conditions. Statistical analysis revealed significant association between several risk factors and outcomes ($p< 0.001$).

In conclusion, despite the ongoing conflict, antenatal care utilization was high, likely due to hospital-based sampling, urban setting, organizational support, and increase health awareness. Strengthening maternal healthcare services remains essential to further improve outcomes.

Conclusion:

- The incidence of twin pregnancy in the hospital observed in this study is 1.3% similar to the global incidence.
- The majority of women were multiparous and the incidence of twin pregnancy increased with increasing maternal age.
- Twinning was detected more among women with a family history particularly on the maternal side.
- The majority of twin pregnancies were diagnosed during antenatal care.
- Anemia, premature birth, urinary tract infection, preeclampsia, polyhydramnios, pressure symptoms, PROM, and PPH were the most frequent maternal complications.
- The rate of cesarean section was lower than that of vaginal delivery with no combined mode of delivery for the second twin.
- The most common indication of the cesarean section was non-vertex presentation of the first twin followed by previous cesarean scar.

- Prematurity, discordant growth, single fetal demise, and congenital anomalies were the most frequent fatal complications.
- The mean birth weight for the first twin was higher than that of the second twin with no statistical difference between the first and second twin in relation to Apgar score at 5 minutes.

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