

Outcomes of multiple pregnancies: results of a perinatology clinic in a tertiary health center

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ABSTRACT

Aim: To evaluate maternal-fetal risks and pregnancy outcomes in multiple pregnancies.

Material and Method: The study included 226 patients with multiple pregnancies who applied to the Perinatology clinic of Izmir Tepecik Training and Research Hospital between January/2020 and December/2022. The data of the patients were recorded and evaluated retrospectively using the hospital database.

Results: Of 226 patients, 211 were twins, 14 were triplets and one was quadruplet. Pregnancy occurred after in vitro fertilization (IVF) in 116 patients and after donation in 1 patient. 55.7% of the patients were older than 35 years. While 137 pregnant (60.6%) were primiparous, 89 patients (39.3%) had a previous pregnancy. While 20 of the twin pregnancies delivered before the 25th gestational week, this number was found to be 7 for triplets. 202 (89.3%) of all multiple pregnant women were delivered by cesarean section. Hypertensive disorder was found in 28 of the twin pregnancies and in 4 of the triplet pregnancies. Gestational diabetes was observed in 41 twin and 3 triplet pregnancies. Small for gestational age (SGA) was observed in 121 twins, 13 triplets and 1 quadruplet pregnancy. Intrauterine growth retardation (IUGR) was observed in 76 twins and 6 triplets. The number of multiple pregnancies with a birth weight less than 2500 g was found to 187 (82.7%) in total. Major congenital anomalies of various organs (cardiac, central nervous system, etc.) were observed in 8 (3.5%) pregnant women.

Conclusion: Preterm birth, increased maternal morbidity and increased cesarean section frequency are some of the risks of multiple pregnancies. These risks can be reduced by knowing the potential risks of multiple pregnancies and by more careful follow-up starting from the early stages of pregnancy.

Keywords: Pregnancy, multiple, pregnancy complications, premature birth, pregnancy outcome

INTRODUCTION

Multiple pregnancy rates vary in different parts of the world. While it is less than 1% of all births in South Asia, this rate is more than 3% in the United States and France (1-3). However, this rate is increasing in developed countries which was 2% in the United States in the 1980s and 3.3% in 2009 (4). Postponing 'the desire to conceive' to older ages and using assisted reproductive techniques more frequently, seems to be the main reasons for the increase in the number of multiple pregnancies (5). The data for Turkey are similar (2.9% of all births in 2020 were multiple births. 96.8% of these births were twins, 3.1% were triplets and 0.1% were quadruplets) (6). While the twin birth rate was 2.8% in 2012, it increased slightly to 2.9% in 2020.

Multiple pregnancies can lead to an increase in perinatal morbidity (7). This increase is mostly due to the increase in the frequency of preterm birth.

Especially in low and middle-income countries, early neonatal mortality due to preterm birth is 7 times more common (7). Low birth weight and intrauterine growth retardation (IUGR) are also common conditions. In addition, the morbidity of the second twin is higher in twins compared to the first twin (8). The negative effect of multiple pregnancies is not only on the fetus. At the same time, there are also maternal negative effects (9). It has been found that 'near miss' cases are more common in women with multiple pregnancies, especially in low and middle-income countries (9). The incidence of postpartum hemorrhage and hypertensive disorders is 4 times higher.

In this study, we evaluated the prognosis, complications and pregnancy outcomes of multiple pregnancies. We tried to find whether there is an increased risk in multiple pregnancies and, if so, at what rates these risks increase.

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MATERIAL AND METHOD

This study was approved by the Izmir Tepecik Training and Research Hospital Ethics Committee (Date: 2023, Decision no: 2023/02-39). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Patients who applied to Izmir Tepecik Training and Research Hospital Perinatology Clinic between January/2020 and December/2022 were included in the study. The information of all patients with multiple pregnancies was documented using the hospital database and archive. The patients' ages, number of pregnancies, weeks of gestation, laboratory values, chorionicity, conditions during pregnancy follow-up and pregnancy results were scanned from the archive. Patients whose information could not be reached from the hospital database were not included in the study. The way in which the pregnancy occurred [spontaneous, in vitro fertilization (IVF) or donation] was documented.

Maternal age was classified into 3 groups (≤ 25 years, 25-35 years and ≥ 35 years). At the end of pregnancy, it was documented in which week of gestation and in which way the delivery occurred (vaginal delivery or cesarean section). The laboratory results of the patients were evaluated and also it was checked whether there was anemia. It was evaluated whether there were any pregnancy complications [Hypertensive disorders, gestational diabetes mellitus (GDM), Small for gestational age (SGA), IUGR, low birth weight (< 2500 gr) and congenital malformation]. In addition, patients who were recommended selective fetal reduction were recorded. Obtained data were recorded and classified, and percentage values were calculated for all groups.

RESULTS

A total of 226 patients with multiple pregnancies were included in the study. Pregnancies of 109 patients were spontaneous (Table 1). However, the number of multiple pregnancies after IVF and donation was 116 and 1, respectively. Of 226 patients, 211 were twins, 14 were triplets and one was quadruplet. While monochorionic monoamniotic (MCMA) pregnancy was present in 11 of the twin pregnancies, monochorionic diamniotic (MCDA) pregnancy was observed in 18 of them. In addition, dichorionic diamniotic (DCDA) pregnancy was observed in 182 patients. While 5 out of 14 triplet pregnancies were observed as dichorionic triamniotic (DCTrA), 9 of them were observed as trichorionic triamniotic (TrCTrA). One patient with quadruplet pregnancy was found to be tetrachorionic tetraamniotic (TCTA).

55.7% of multiple pregnancies were older than 35 years (Table 2). The percentage of pregnant women under the age of 25 was 14.6%. While 137 (60.6%) of 226 patients were primiparous, 89 (39.3%) patients had previous pregnancies. 20 of the twin pregnancies and 7 of the triplet pregnancies delivered before 25 weeks of gestation. While 45 patients (19.9%) with twin pregnancies delivered after 34 weeks of gestation, no birth was observed in triplets and quadruplets over this week. 202 (89.3%) of all multiple pregnant women were delivered by cesarean section. Anemia ($Hb < 11$ mg/dL) was detected in 128 patients with twin pregnancies and 4 patients with triplets (58.4%). Patients with high blood pressure ($\geq 140/90$ mmHg) after the 20th week of pregnancy were considered as hypertensive disorder of pregnancy and was found in 28 patients with twins and in 4 patients with triplet pregnancies (14.1%). Patients with high values (fasting glucose ≥ 5.1 mmol/L, 1st hour glucose ≥ 10 mmol/L, 2nd hour glucose ≥ 8.5 mmol/L) in the 75 g oral glucose tolerance test were considered as GDM. GDM was observed in 41 patients with twin pregnancies and 3 patients with triplet pregnancies (19.4%). Pregnancies with an estimated fetal weight below the 10th percentile according to the gestational week were accepted as SGA and it was observed in 121 twin pregnancies (53.5%). In addition, SGA findings were observed in 13 triplets and 1 quadruplet pregnancy. Fetuses with fetal abdominal circumference below the 3 percentile were evaluated as IUGR. While IUGR was detected in 82 multiple pregnancies (36.2%) in total, 76 of them had twin pregnancies and 6 of them had triplets. The number of multiple pregnancies with a birth weight of less than 2500 g was found to be 187 (82.7%) in total. Of these, 172 were twin pregnancies, 14 were triplets, and 1 was quadruplet. Major congenital anomaly of various organs (cardiac, central nervous system, etc.) was observed in 8 (3.5%) pregnant women. Selective fetal reduction was offered to 2 pregnant women with MCDA/major congenital anomaly in a single fetus and 1 pregnant woman with DCTrA/major congenital anomaly in a single fetus, but they did not accept it. Selective fetocide was applied to 4 patients with DCDA and 1 patient with TrCTrA who had major anomaly in one fetus. Fetal reduction was offered to the pregnant woman with quadruplets, but she refused.

DISCUSSION

Increasing use of assisted reproductive techniques and postponing pregnancy to advanced ages have increased the incidence of multiple pregnancy (10,11). In our study, the rate of pregnancy over the age of 35 was 55.7%. We think that this high rate is especially related to pregnant women who have undergone IVF treatment. Also, the high rate of DCDA pregnancies is related to IVF pregnancies.

Table 1. Chorionicity and conception patterns of the patients participating in the study

	Twins (n=211)			Triplets (n=14)		Quadruplets (n=1)
	MCMA	MCDA	DCDA	DCTrA	TrCTrA	TCTA
SP (n)	11	17	67	4	9	1
IVF (n)	-	1	114	1	-	-
Donation (n)	-	-	1	-	-	-
Total (n)	11	18	182	5	9	1

SP; spontaneous pregnancy, IVF; in vitro fertilization, MCMA; monochorionic monoamniotic, MCDA; monochorionic diamniotic, DCDA; dichorionic diamniotic, DCTrA; dichorionic triamniotic, TrCTrA; trichorionic triamniotic, TCTA; tetrachorionic tetraamniotic

Table 2. Demographic characteristics, time/type of delivery and pregnancy complications of patients with multiple pregnancies

	Twins			Triplets		Quadruplets	Total (n=226) (n,%)
	MCMA (n=11)	MCDA (n=18)	DCDA (n=182)	DCTrA (n=5)	TrCTrA (n=9)	TCTA (n=1)	
Maternal age (year)							
<25 (n)	3	6	22	-	2	-	34 (14.6)
25-35 (n)	4	4	52	3	3	1	67 (29.6)
>35 (n)	4	8	108	2	4	-	126 (55.7)
Parity							
Primiparous (n)		6	116	4	6	1	137 (60.6)
Multiparous (n)		12	66	1	3	-	89 (39.3)
Week of birth							
<25 wk (n)	2	4	14	4	3	-	27 (11.9)
25 wk-34 wk (n)	9	14	123	1	6	1	154 (68.1)
>34 wk (n)	-	-	45	-	-	-	45 (19.9)
Type of birth							
Vaginal (n)	2	4	14	2	2	-	24 (10.6)
Cesarean section (n)	9	14	168	3	7	1	202 (89.3)
Anemia (n)	5	9	114	2	2	-	132 (58.4)
Hypertensive disorders	4	5	19	1	3	-	32 (14.1)
GDM (n)	3	6	32	1	2	-	44 (19.4)
SGA (n)	7	8	121	5	8	1	150 (66.3)
IUGR (n)	4	7	65	3	3	-	82 (36.2)
Low birth weight (<2500 gr) (n)	11	14	147	5	9	1	187 (82.7)
Congenital malformation (n)	2	1	4	-	1	-	8 (3.5)
Selective fetal reduction (n)	-	- ^a	4 ^b	- ^c	1 ^b	- ^d	5 (2.2)

MCMA; monochorionic monoamniotic, MCDA; monochorionic diamniotic, DCDA; dichorionic diamniotic, DCTrA; dichorionic triamniotic, TrCTrA; trichorionic triamniotic, TCTA; tetrachorionic tetraamniotic, IVF; in vitro fertilization, GDM; gestational diabetes mellitus, SGA; Small for gestational age, IUGR; Intrauterine growth restriction. ^aLaser coagulation was recommended to 2 patients in terms of congenital anomalies, but not accepted. ^bSelective fetocide for congenital anomaly. ^cLaser coagulation was recommended to 1 patient in terms of congenital anomaly, but not accepted. ^dFetal reduction was recommended but not accepted.

Multiple pregnancies continue to pose maternal and fetal risks. The probability of stillbirth is higher than in single pregnancies, so the timing of delivery is important. Premature births increase the potential risk in neonatal outcomes (12,13). Khalil et al. (14) stated that more than half of multiple pregnancies delivered before 37 weeks of gestation, and 15% before 34 weeks of gestation. Similarly, we found in our study that only 19.9% of all multiple pregnancies gave birth after 34 weeks of gestation. The rate of multiple pregnancies resulting in preterm birth between 25 and 34 weeks of gestation was 68.1%. All this increase in the frequency of preterm birth is likely to increase fetal risks as well. SGA or IUGR are also more common in multiple pregnancies and the rate of fetuses with low birth weight was found to be 82.7%.

The mode of delivery in multiple pregnancies is still a matter of debate. Cesarean section is frequently performed when the second fetus is not cephalic (15,16). There are studies indicating that planned cesarean section before 36 weeks of gestation may increase neonatal morbidity (16). However, it is also stated that there is decreased neonatal morbidity after 37 weeks. Again, a similar study showed that planned cesarean section did not lead to a decrease in neonatal morbidity (15). In our study, we found that the rate of cesarean section in all multiple pregnancies was 89.3%. Since the rate of cesarean section is higher in pregnant women who exceed the viability limit above 24 weeks, it increases the rate of cesarean section in all multiple pregnancies. In labors before the fetal viability (<24 weeks), vaginal delivery is generally preferred if there is no maternal risk. There may

be several reasons for this high rate of cesarean section. First of all, it may be possible to take the decision of cesarean section more easily because of malpractice cases. In addition, the center where the study was conducted is a tertiary center and because of that reason, high-risk pregnancies are referred from other hospitals in large numbers. Since vaginal delivery is more risky in these pregnant women, the rate of cesarean section may have been high in our study. Finally, triplet and quadruplet pregnancies are also included in this rate. Since cesarean section is indicated in these patients, all of them delivered by cesarean section and as a result of this, the total cesarean section rate increased.

There are articles in the literature evaluating the relationship between GDM and multiple pregnancies. Morikawa et al. (17) did not find a difference between multiple and single pregnancies in terms of GDM. In addition, Bajagain et al. (18) found a similar GDM rate in multiple pregnancies to singleton pregnancies (11.42%). However, in our study group, the incidence of GDM was found to be higher in multiple pregnancies. High maternal age is likely to increase the probability of GDM and we think that the high GDM frequency in our study is related to this. In addition, hypertensive disorders of pregnancy may increase in multiple pregnancies. In the ACOG bulletin, it is stated that the frequency of preeclampsia increases in multiple pregnancies (19). Similarly, Narang et al. (20) reported in their article that hypertensive disorders were seen with a rate of 12.7% in twin pregnancies. In our study, we found that hypertensive disorders of pregnancy were observed more frequently (14.1%) in patients with multiple pregnancies. We think that this result may be related to both advanced maternal age and increased placental volume due to multiple pregnancy.

Finally, when we evaluated the patients in terms of anemia, 58.4% of the patients were found to have maternal anemia. These results were similar to previous literature. Ru et al. (21) reported in their study that the frequency of anemia in multiple pregnancies was higher than in single pregnancies.

Piro et al. (22) found the frequency of congenital anomalies in twin pregnancies as 11%. We found this rate lower in our patient population (3.5%). We think that, the low number of patients participating in the study and the termination of pregnancies with major anomalies in the early stages may explain this low rate.

CONCLUSION

The frequency of multiple pregnancies is increasing and the problems it brings are also increasing. Preterm birth, increased maternal morbidity and increased cesarean section frequency are just a few of the risks that multiple pregnancies increase. We believe that, with this study,

we will contribute to the literature about the problems that may arise in multiple pregnancies. These risks can be overcome more easily by knowing the potential risks of multiple pregnancies and with more careful follow-up starting from the early stages of pregnancy.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Izmir Tepecik Training and Research Hospital Ethics Committee (Date:2023, Decision no: 2023/02-39).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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