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The outcome of the multifetal pregnancy reduction procedures in a single centre: A report of 202 completed cases

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ABSTRACT

Objective: To review the results of fetal reduction procedures in our institution, evaluate its effects on the pregnancy outcome in terms of miscarriage, preterm delivery, taking home healthy babies and discuss the factors that may have contributed to the outcome.
Study design: This is a retrospective study performed at the Fetal Medicine Unit of the Sisli Memorial Hospital in Istanbul after ART therapies in our unit from 2000 to 2011.
Results: The sample comprised 151 triplets, 35 quadruplets, 11 quintuplets, 3 twins, 1 sextuplet and 1 septuplet. The average maternal age was 30 ± 4.4 and the average week of interventions was 11.7 ± 1.3 weeks. In 40 cases two or more needle insertions were necessary. The two-week post-procedure loss rate, defined as 'the procedure related loss rate', was 0.7%; however, for the whole sample, the losses were 6.9% when they occured before 24 completed weeks and was defined as 'the total loss rate'. 184 of the remaining 188 cases had at least one baby to take home (91.1% of 202 patients). The average birth week for those healthy babies discharged home was 35.5 ± 2.4. The rate of early preterm birth before gestational weeks of 32 was 9%. The mean birthweight of this "take-home" group was 2302 ± 525 g.
Conclusion: Fetal reduction in multifetal pregnancy is associated with low miscarriage rate and preterm delivery rates. Fetal reduction in multifetal pregnancy should be considered for better pregnancy outcomes and the results of this study can be used in prenatal counseling.

Introduction

Reducing the number of fetuses in triplet and higher order multiple pregnacies has been a widely employed procedure since assisted reproduction technologies (ART) became almost explosively common all over the world in the past few decades. As the number of embryos tranferred were kept high to ensure "success", the number of triplet and higher-order multiple pregnancies rose accordingly [1,2].

The rapid increase of the rate of twins and higher-order multiple births has been shown to be largely attributable to ART in the past three decades [1–3]. Older childbearing age accounts for only one-third of this increase with infertility treatments account for the remainder [1,3]. The incidence of loss, prematurity and related sequelae rise along with the fetal number [4–7]. The two obvious prevention modalities of such problems stand out as achieving a singleton or twin pregnancy to start with, or failing that, performing fetal reduction procedures.

It is generally accepted that elective fetal reduction of high order multiple pregnancy with 4 or more fetuses substantially improves maternal and perinatal outcomes. On the other hand, studies comparing triplet pregnancies reduced to twins and triplet pregnancies managed conservatively have reported conflicting results: some have shown no difference in gestational age at delivery or in neonatal outcomes [8,9], whereas others have reported substantial improvements in perinatal outcomes, such as, preterm birth and low birth weight [10–12].

The aim of this study was to evaluate the outcome of multiple pregnancies that were reduced to a single fetus or twins or triplets with regard to the risks of miscarriage, rate of preterm delivery, birthweight and the rate of taking home healthy babies.

Materials and methods

This is a retrospective study performed at the Fetal Medicine Unit of the Şişli Memorial Hospital in Istanbul after ART therapies

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in the unit from 2000 to 2011. We looked into a wide range of factors to elucidate their effectiveness on influencing the outcomes of 206 multifetal pregnancy reduction procedures performed during this period.

The patients were scanned a week to a few days prior to the intended fetal reduction procedure to take place around 10–11 weeks of the pregnancy, and again a few days later if required. Triplets were counseled, giving information on the possible success rate of the procedures and those related prematurity, handicap risks and intensive care unit probabilities. Higher order multiples (quadruplets and higher) were counseled on the basis that their risks warrant a recommendation of reduction procedure from a medical point of view, but in every case the decision was left with the couple after making sure the known facts were fully understood. On the same scan visit, chorionicity, growth (Crown-rump length; CRL), nuchal translucency, gestational sac size, proximity to the internal cervical os, and other anatomical criteria for fetal normality were noted for each fetus. No information on the sex of the fetuses was revealed. If the couple expressed preference for undergoing reduction, the final decision to proceed with the process was made through considering the above parameters and the location of the fetuses in the uterus. The lowermost sac/fetus on the internal os was avoided whenever possible, except in cases where a probable anomaly or a monochorionic pair in that position was assessed. All procedures were performed by the same operator (the first author), the same trained nurse and an assisting nurse. Only one observer in the team was present. The spouse was allowed in only if the couple requested it. The skin was prepared with swabs of 70% alcohol first and povidone-iodine afterwards, the colored antiseptic especially used to avoid any mistakes about the prepared portion of the skin. A final touch with a dry swab delineated the area of entry. A two-stage local anesthetic (Xylocaine 2%) infiltration was followed by the introduction of a #21 gauge, 12 or 15 cm needle. Other fetuses' sacs were strictly avoided during insertion. An injection of 15% potassium chloride, 0.5 ml when intracardiac or 1–1.5 ml when intrathoracic, was sufficient to achieve asystole. After two to three minutes of observation in this state, the needle was withdrawn. The patient was taken to a quiet room to rest for an hour and then allowed home with an advice to stay home for the rest of the day and the day after. When a monochorionic pair was to be reduced (28 cases in the present sample, 13 triplets and 15 higher-order multiples), only one of the fetuses was injected. A control-scan was perform after 3 to 5 days after the procedure, and in all instances, the other fetus was found to have followed suit. A maximum number of two fetuses were reduced in one session. For instance, we took three sessions (2 - 2 -1) to reduce the one septuplet to twin.

Data were obtained from written and computer databases. The majority of the patients were delivered in other hospitals in different provinces of the country, information from them was obtained by correspondence over mail and phone. The study sample of 202 cases were included in the study. A wide range of parameters including age, initial number of fetuses, remaining number of fetuses, chorionicity, loss within two weeks of the procedure, loss before 24 weeks, birth week, birth weight and neonatal outcome were saved. Four cases, one triplet, one quadruplet and two quintuplets were excluded from the study for reasons of uncertain data and termination (of the quadruplet) for anomaly.

Data analysis was performed by using Statistical Package for Social Sciences (SPSS) version 11.5 software (SPSS Inc., Chicago, IL, United States).Descriptive statistical methods (mean, standard deviation and range) were used to evaluate the data. Kolmogorov–Smirnov test was performed to determine whether or not parameters are normally distributed. Student's *t*-test and Mann-Whitney U to compare parameters among the groups. Results were evaluated with 95% confidence intervals, and $p < 0.05$ was considered to indicate significance.

Table 1
Breakdown of 202 reduction cases in terms of multiplicity and chorionicity.

	Total Number of Patients	Dichorionic	With monochorionic combination(s)
Triplets	151	138	13
Quadruplets	35	26	9
Quintuplets	11	8	3
Sextuplets	1	–	1
Septuplets	1	1	–
Twins	3	3	–
TOTAL	202	176	26

Results

Of the total study sample of 202 patients: 151 triplets, 35 quadruplets, 11 quintuplets, 3 twins, 1 sextuplet and 1 septuplet (Table 1), the average maternal age was 30 ± 4.4 (20–49) and the mean number of fetuses was 3.3 ± 0.6 (2–7). Out of this total, 175 pregnancies were reduced to twins, 24 were reduced to singletons and 3 were reduced to triplets (Table 2). The average week of interventions was 117 ± 1.3 weeks, the mean of the number of remaining fetuses were 1.9 ± 0.3 (1–3) and the mean of the number of interventions were 1.2 ± 0.5 (1–5).

The procedure-related loss rate was 0.7% (one case, a triplet), the total loss rate (miscarriage before 24 completed weeks) was 6.9% (with 9 triplets, 2 quadruplets, 1 quintuplet and 1 sextuplet) (Table 3). The total loss rate for the triplets and the quadruplets were very close each other (6.6% and 5.7% respectively) to and to the whole sample. 11 (3.1%) neonatal deaths occured in total: 7 (2.7%) of the fetuses who started as triplets, 3 (4.4%) of the quadruplets and 1 (5.2%) of the quintuplets (Table 4). As seen in Table 5, a total of 184 patients out of 202 (91.1%) were able to take home at least one baby (the "take home baby" rate). Of these 154 mothers embraced twins, 27 mothers a single baby, and 1 mother took home triplets: an average of 187 baby per mother.

The birth weight in each group of reduction cases, determined according to their starting and finishing number is shown in Table 6. When the whole study sample is considered, the average birth weight of the healthy babies discharged home is 2302 ± 525 g. The average rate of weight difference of all twins born in this group with any starting number was 115 percent. Twins reduced from quadruplets displayed significant discordance rate from those reduced from triplets (233% and 11.9% respectively) (Table 7). The gestational ages at delivery (birth week) of all infants according to their starting and finishing numbe r are given in Table 8. The average birth week of the whole sample (344 infants) was 355 ± 2.4. The rate of early preterm birth before gestational weeks of 32 was 9%.

Comment

Multifetal pregnancy reduction (MFPR) clearly promises better neonatal outcomes in terms of reducing the rate of moderate and severe prematurity, morbidity and neuropsychomotor disability [4–7]. The most common practice is to reduce the total number of fetuses to two [13,14], but there is also published data that reducing to singleton as opposed to a twin results in a later gestational age at birth, without significant differences in fetal loss rate or "take-home baby rate" : defined as the number of mothers taking at least one baby home [14,15]. The fetal loss rate of 9.1% when reduced to singleton versus 5.1% when reduced to twins is a difference not found to be significant in the study by Kuhn-Beck