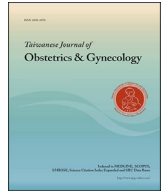




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Original Article

Early fetal reduction to twin versus prophylactic cervical cerclage for triplet pregnancies conceived with assisted reproductive techniques

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ABSTRACT

Objective: To compare the obstetric outcomes of triplet gestations managed by early fetal reduction to twins with those managed by prophylactic cervical cerclage in women conceived with assisted reproductive techniques (ART).

Materials and methods: Retrospective study of the pregnancy and neonatal outcomes of trichorionic triplet gestations achieved by ART and managed either by early transvaginal fetal reduction to twins (n = 53) or by prophylactic placement of cervical cerclage (n = 65).

Results: The pregnancy duration was significantly longer with fetal reduction and the incidences of delivery before 34 and 32 weeks gestational age were significantly lower with fetal reduction. Both miscarriage and live birth rates were comparable in the two groups. The incidences of very low birth weight (VLBW), neonatal respiratory distress syndrome (RDS), admission to neonatal intensive care unit (NICU) and early neonatal death (END) were significantly lower with fetal reduction.

Conclusion: Early transvaginal reduction of triplets to twins leads to improved obstetric outcomes as it decreases prematurity and its related neonatal morbidities and mortality without increase in the miscarriage rate. Early fetal reduction seems to be better than continuation of triplet pregnancies with prophylactic placement of cervical cerclage.

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Introduction

Iatrogenic multifetal pregnancies have been increased due to increased use of assisted reproductive techniques (ART) [1]. These pregnancies have a higher incidence of fetal and neonatal complications including, spontaneous miscarriage, intrauterine growth restriction (IUGR), preterm labor, low birth weight (LBW) and perinatal morbidities and mortality [2].

Limiting the number of transferred embryos or the use elective single embryo transfer policy has been advocated to avoid iatrogenic multifetal pregnancy [3]. Fetal reduction and prophylactic placement of cervical cerclage have been used as secondary options for management of multifetal pregnancies aiming at reducing the complications related to this problem [4,5].

When compared to expectant management, reduction of triplets to twins decreased the fetal and neonatal morbidities and mortality in many reports [6–8]. However, the results of prophylactic placement

of cervical cerclage in triplet gestations are still controversial. Some studies found no benefit of this management option over the expectant management [9–12].

To our knowledge, all studies considering fetal reduction or prophylactic placement of cervical cerclage as management options for triplet pregnancies have compared either of these two options to the expectant management but not to each other. Therefore, we aimed in this study to compare the obstetric outcomes of triplet gestations managed by early fetal reduction to twins with those managed by prophylactic cervical cerclage in women conceived with ART.

Materials and methods

Study design

This was a retrospective study conducted during the period from January 2011 to December 2016 in Mansoura University Hospital and private practice settings in Mansoura, Egypt. The study was approved by the Mansoura Faculty of Medicine Institutional Research Board (Code No. R/15.08.37). The main inclusion

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criterion was trichorionic triplet pregnancies achieved by ART. For all women, transvaginal sonography (TVS) scan was performed at 6–7 weeks of gestation to confirm presence of three intrauterine gestational sacs with presence of only one living embryo in each sac. Parents were then counseled regarding the options of early fetal reduction, prophylactic placement of cervical cerclage or expectant management. The decision of management option depended essentially on the choice of the parents because there was no conclusive evidence of an advantage of any option over the others.

Women included in the study were those who had opted for either early fetal reduction or prophylactic cervical cerclage. Before performing any procedure (fetal reduction or cervical cerclage), parents were informed about the procedure, the potential risks and the chance of success and a written consent was obtained. Also, a written permission was obtained from each woman to use her data for research purposes. Maternal demographic characteristics, ultrasound findings and the details of the procedure performed were recorded in a database. When the pregnancy and neonatal outcomes became available, they were collected into the same database. Women excluded from study were those who were diagnosed to have cervical insufficiency in the index pregnancy or a previous pregnancy and those who were diagnosed to have congenital uterine malformation. Women were also excluded from analysis if the pregnancy outcome or neonatal outcome data were unavailable.

Fetal reduction

Fetal reduction procedure was performed between 7 and 8 weeks of gestation by ultrasound guided transvaginal embryo puncture and aspiration without injecting any substance. A preliminary TVS scan was performed to confirm viability, measure the crown-rump length (CRL) and determine the position of the three fetuses. The procedure was performed in the operative theatre under full aseptic conditions and light general anesthesia. The patient received intravenous antibiotic prophylaxis (Cefoperazone 1 gm) and the vagina was cleaned with an antiseptic solution.

A sterile single lumen, 18–20 gauge, 30 cm suction needle was connected to a vacuum pump that makes a negative pressure adjusted to a maximum 200 mmHg. The uterus was scanned to identify the configuration of each gestational sac and determine the position of each sac in the uterine cavity and location of each sac relative to each other. The embryo with the smaller CRL was selected for termination; however, when all embryos had normal CRL, the most easily accessible embryo was selected for termination, based on easy access to transvaginal needle insertion. The transducer was then rotated and manipulated until the selected embryo appears aligned with the needle guiding line on the screen of the ultrasound machine. The needle was then pushed through the vaginal fornix and then through the uterine wall to the selected gestational sac. The tip of the needle was then placed into the fetal echoes and suction was applied repeatedly till aspiration of as much as possible of the embryonic parts and amniotic fluid and disappearance of fetal cardiac pulsation. While the needle in place, absence of pulsation in any remaining fetal echo was confirmed again then the needle was withdrawn.

Before removal of the transducer from the vagina, the uterus was scanned to confirm again that there is no pulsation in any remaining parts of the reduced fetus and ensure that the other two gestational sacs are intact with presence of fetal poles and cardiac pulsations. If pulsation was still observed in the remaining echo of the reduced fetus, a second puncture was performed in the same setting and suction was repeated till disappearance of this pulsation.

The patient was monitored for 6 h after the procedure then discharged on prophylactic oral antibiotic therapy (Amoxicillin 250 mg + Flucloxacillin 250 mg every 8 h) for 7 days and oral analgesic (Paracetamol 500 mg) if needed. An ultrasound scan was performed one week after the procedure to confirm presence of only two intact gestational sacs with fetal poles and cardiac pulsations. All women received the routine antenatal care and regular pregnancy follow up.

Cervical cerclage

The prophylactic cervical cerclage was performed between 12 and 14 weeks of gestation by transvaginal placement of purse-string suture at the cervicovaginal junction, without mobilization of the urinary bladder (McDonald cervical cerclage) [13].

Outcome measures

The main outcome measures of the study were delivery before 34 and 32 weeks gestational age, miscarriage rate, live birth rate, very LBW (VLBW), neonatal respiratory distress syndrome (RDS), admission to neonatal intensive care unit (NICU) and early neonatal death (END). Miscarriage was defined as spontaneous pregnancy loss before completing 24 weeks gestational age. Live birth was defined as birth of a living fetus after 24 weeks of gestation regardless of gestational age. The LBW was defined as a birth weight of a living neonate of <2500 gm regardless of gestational age while the VLBW was defined as a birth weight of a living neonate of <1500 gm regardless of gestational age.

Statistical analysis

The analysis of data was done using the IBM® SPSS® Statistics, version 20.0 for Windows. The categorical variables were presented as frequencies and percentages and the Fisher's exact probability test was used to compare the differences between percentages. The continuous variables were presented as mean \pm standard deviation (SD) and the Shapiro–Wilk and Kolmogorov–Smirnov tests were used to test the normality distribution of the continuous variables. The *t*-test was used to compare the differences among the normally distributed continuous variables while the differences among continuous variables without normal distribution were compared with the Mann–Whitney U-test. Statistical significance was determined at a *P* value of <0.05. The probability of an event to occur between the two groups was compared with the relative risk (RR) and the odds ratio (OR).

Results

The population of this study consisted of 118 women with triplet pregnancies achieved by ART. Fifty three women were managed by early fetal reduction to twins (fetal reduction group) while 65 women had been managed by prophylactic placement of cervical cerclage (cervical cerclage group).

The mean maternal age was comparable in both fetal reduction and cervical cerclage groups (29.09 \pm 3.63 years vs 28.89 \pm 4.10 years, respectively). About 13.2% of women in the fetal reduction group conceived with intrauterine insemination (IUI) and 86.8% conceived with IVF/ICSI while in the cervical cerclage group, 9.2% of women conceived with IUI and 90.8% conceived with IVF/ICSI (Table 1).

The pregnancy duration (gestational age at birth) was significantly longer in women who underwent fetal reduction than in those who received cervical cerclage (33.47 \pm 2.82 weeks vs 31.63 \pm 2.90 weeks; *P* < 0.001). The incidence of delivery before 34

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