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Research Article

Role of Prophylactic Cerculage after Fetal Reduction

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Abstract

Introduction: Multifetal pregnancies may be monochromic or dichorionic or mixed chorionicity. The incidence of spontaneous twin pregnancy is 1:90 and the incidence of triplets is 1:8000. Intrauterine growth retardation and prematurity are the significant factors that affect neonatal morbidity and mortality. There are two methods used to prevent multifetal pregnancy complications, selective embryo transfer and fetal reduction. Fetal reduction can be done early at 6 to 8 weeks or late at 11 to 13 weeks either transvaginally or trans abdominally using KCL injection or ultrasound guided embryo aspiration technique. The reduction of triplets to twins is effective in improving neurological outcome, preterm birth, fetal growth and overall the rate of pregnancy loss. The effect of cerclage after fetal reduction in multifetal pregnancy whether it increases the risk or improves the outcome is unknown so it needs to be studied.

Aim: The aim of this study was to evaluate the effect of prophylactic cerclage in the duration of pregnancy after fetal reduction.

Methods: Sixty pregnant women from 18 to 35 years old, who performed fetal reduction from triplets to twins, were included in the study. They were divided into group A and B according to cerclage placement. In all 60 women early transvaginal, embryo aspiration was done while cervical cerclage placement was performed in all women of group A only using the McDonald technique under general or spinal anesthesia. Data collected on patient history included maternal age, marital status, last menstrual period, obstetric history, embryo transfer date and medical history. Transvaginal ultrasound was done to measure cervical length at 16, 24 and 32 gestational weeks using 5 or 7.5 MHZ transducer. Abdominal ultrasound was done to exclude fetal congenital anomalies and to observe fetal growth. Data collected on pregnancy outcome were based on gestational age at delivery, route of delivery and fetal condition.

Results: Regarding maternal age, there was no statistical difference between the 2 groups with a mean age of 27.90 ± 3.84 years and 26.47 ± 4.22 years in the cerclage group (A) and the control group (B), respectively. Regarding the mean cervical length at 24 gestational weeks, there was no statistically significant difference between the 2 groups, so it was 34.17 ± 4.73 mm in the cerclage group (A) and it was 34.92 ± 4.77 mm in the control group (B). Regarding miscarriage, there were 6.7% in the cerclage group and 16.7% in the control group delivered before 28 gestational weeks with no significant difference. There was no statistically significant difference between mean gestational age at delivery between 2 groups with mean gestational age of 35.03 ± 4.09 weeks, 34.54 ± 5.96 weeks in the cerclage group (A) and the control group (B), respectively. However, regarding birth weight, there was statistically significant difference between the 2 groups, so that in the cerclage group (A) the mean birth weight was 2.21 ± 0.54 kg, while the mean birth weight in the control group (B) was 2.49 ± 0.51 Kg.

Conclusion: There is no need to perform prophylactic cerclage after fetal reduction in twin pregnancy.

Keywords: Cerculage; Reduction

Introduction

Multifetal pregnancies may be monochromic or dichorionic or mixed chorionicity. The incidence of spontaneous twin pregnancy is 1:90 and the incidence of triplets is 1:8000 [1]. Intrauterine growth restriction and prematurity are the significant factors that affect neonatal morbidity and mortality [2]. There are two methods used to prevent multifetal pregnancy complications, selective embryo transfer and fetal reduction [3]. FR can be done early at 6 to 8 weeks or late at 11 to 13 weeks either transvaginally or trans abdominally using KCL injection either intracardiac or intracranial, air embolization, embryo aspiration technique and recently amniotic fluid intracardiac injection [4,5].

Chorionic villous sampling is done before fetal reduction without any effect on the pregnancy outcome to exclude any chromosomal

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abnormalities. It is performed as a 2-day procedure at 12 weeks of gestation [6]. The reduction of triplets to twins is effective in improving neurological outcome, preterm birth, fetal growth and overall the rate of pregnancy loss [4].

FR that is done early in gestation by transvaginal embryo aspiration improves the pregnancy outcome because it has a lower immediate loss rate, pregnancy loss rate, and PPROM (Previable Premature Rupture of Membrane) rate compared with the late transvaginal KCL injection, however, the development of infection and general anesthesia usage are common disadvantages of this method [7].

In high-order multifetal pregnancies, FR is associated with a decrease in the risk of miscarriage and perinatal death as compared to the original number of fetuses butthecomplication rate was higher in patients carrying twins reduced from quadruplets than triplets due to increased amount of non-viable remnants of fetal and placenta tissue after the reduction procedure [8].

In trichorionic triplets, FR to twins is associated with an increase in the risk of subsequent miscarriage before 24 weeks of gestation and decrease in risk of early preterm birth before 32 weeks of gestation [9]. However, FR has increased full term delivery of high order multifetal gestations from 10% to 57%.

The complications of FR procedure are infection, miscarriage and preterm birth [10,11].

Lengthening of the cervix after cerclage is observed but it is not predictive of term delivery. Serial cervical length measurements can predict preterm birth and provide earlier warning in patients with a prophylactic cerclage [12]. The rate of cervical shortening throughout pregnancy was 1.8 mm/week in women delivering twins ≥37 weeks *vs.* 1.0 mm/week in women delivering a single baby ≥37 weeks [13]. When cerclage was used in asymptomatic women with twin gestations and short cervical length on transvaginal ultrasound examination, it significantly increases the risk of delivery before 35 weeks of gestation [14].

The use of prophylactic cerclage for ovulation induced twin gestations did not decrease the rate of prematurity significantly or neonatal mortality [15]. The effect of cerclage after FR in multifetal pregnancy whether it increases the risk or improves the outcome is unknown so it needs to be studied.

Patients and Methods

Ninety pregnant women from 18 to 35 years old, who performed fetal reduction from triplets to twins, were included in the study. They were divided into group A and B according to cerclage placement. Thirty patients were excluded due to the development of preeclampsia, gestational DM, intrauterine fetal death, fetal congenital anomalies, preterm premature rupture of membrane and whose data was incomplete. Data collected on patient history included maternal age, marital status, last menstrual period, obstetric history, embryo transfer date and medical history.

In all patients early transvaginal embryo aspiration was done under general anesthesia using propofol 10% or spinal anesthesia. After vaginal cleansing with a povidone-iodine solution 10%, IV antibiotic prophylaxis was injected then a 5 or 7.5 MHz transvaginal transducer was used to check fetal viability, number, size and position of each gestational sac relative to the uterine cavity and to each other. A 30cm long, 17-gauge needle was inserted through the puncture guide and was advanced once with a brisk movement through the vaginal fornix and the uterine wall into the most easily accessible sac, while cervical cerclage placement was performed in all patients of group A only using the McDonald technique under general or spinal anesthesia. Follow up transvaginal ultrasound was done to measure cervical length at 16, 24 and 32 gestational weeks using 5 or 7.5 MHZ transducer. Abdominal ultrasound was done to exclude fetal congenital anomalies and to observe fetal growth. Data collected on pregnancy outcome were based on gestational age at delivery, route of delivery and fetal condition.

Table 1: Comparison between the two studied groups according to obstetrics data.

Obstetrics Data	Group A (n= 30)		Group B (n= 30)		Test of sig.	p
	No.	%	No.	%		
Gravidity						
Primary	27	90	24	80		^{FE}p= 0.472
Multi	3	10	6	20		
Min. – Max.	1.0 – 2.0		1.0 – 2.0			
Mean ± SD.	1.33 ± 0.58		1.17 ± 0.41		U= 7.5	0.593
Median	1		1			

p values for Chi square test for comparing between the two groups. ^{FE}p: p value for Fisher Exact for Chi square test for comparing between the two groups. U, p: U and p values for Mann Whitney test for comparing between the two groups.

Results

There was no statistically significant difference between mean gestation age at delivery between 2 groups with mean gestational age of 35.03 ± 4.09 weeks, 34.54 ± 5.96 weeks in thecerclage group (A) and the control group (B), respectively. However, regarding birth weight there was statistically significant difference between the 2 groups, so that in the cerclage group (A) the mean birth weight was 2.21 ± 0.54 kg, while the mean birth weight in the control group (B) was 2.49 ± 0.51 kg (p=0.003).

Discussion

Multifetal pregnancy, especially high order multifetal pregnancy is increasing nowadays due to assisted reproductive techniques. It is associated with many complications the most important one is preterm labor, thus many studies were done in order to predict or prevent premature birth [16].

Fetal reduction is performed in order to prevent preterm birth as a result of high order multifetal pregnancy [17]. The insertion of cervical cerclage in multifetal pregnancy was not recommended as it increased the risk of preterm birth 2 folds before 35 gestational weeks, especially when performed for patients whose cervical length below 25mm [18].

To the best of our knowledge we have not been able to find any publications showing the effect of prophylactic cerclage on the pregnancy outcome in reduced twin pregnancy, but some studies

Table 2: Comparison between the two studied groups according to gestational age at delivery (weeks).

Gestational age at delivery (weeks)	Group A (n= 30)		Group B (n= 30)		Test of sig.	P
	No.	%	No.	%		
<20 weeks	1	3.3	1	3.3		
20 - <28 weeks	1	3.3	4	13.3		
28 - <32 weeks	2	6.7	1	3.3		^{MC}p= 0.210
32 - <34 weeks	7	23.3	3	10		
34 - <37 weeks	6	20	2	6.7		
>37 weeks	13	43.3	19	63.3		
Min. – Max.	19.0 – 38.71		18.0 – 39.0			
Mean ± SD.	35.03 ± 4.09		34.54 ± 5.96		U= 390.5	0.379
Median	36.07		37.43			

p values for Chi square test for comparing between the two groups.
^{MC}p: p value for Monte Carlo for Chi square test for comparing between the two groups.
U, p: U and p values for Mann Whitney test for comparing between the two groups.

Table 3: Comparison between the two studied groups according different parameters.

	Group A		Group B		Test of sig.	P
	No.	%	No.	%		
Mode of delivery	(n= 28)		(n= 25)			
CS	26	92.9	21	84		^{FE}p= 0.404
NVD	2	7.1	4	16		
Birth Weight (kg)	(n= 56)		(n= 50)			
<1.5	6	10.7	1	2		^{MC}p= 0.159
1.5 – 2.5	20	35.7	16	32		
>2.5	30	53.6	33	66		
Min. – Max.	1.10 – 2.90		1.30 – 3.20			
Mean ± SD.	2.21 ± 0.54		2.49 ± 0.51		U= 926.0*	0.003*
Median	2.5		2.7			

p values for Chi square test for comparing between the two groups
^{MC}p: p value for Monte Carlo for Chi square test for comparing between the two groups
^{FE}p: p value for Fisher Exact for Chi square test for comparing between the two groups
U, p: U and p values for Mann Whitney test for comparing between the two groups
*: Statistically significant at p ≤ 0.05

were carried out on patients with twin pregnancy resulting from assisted reproductive techniques showed that there were no benefit in performing cerclage, knowing that cervical cerclage is a surgical procedure and is associated with procedure related morbidity, including risks of anesthesia, bleeding, preterm premature rupture of membranes, infection, cervical laceration, hemorrhage, and pregnancy loss [19].

The Gestational age at delivery between 28 gestational weeks and 32 gestational weeks was 6.7%, 3.3% in the cerclage and the control group, respectively, which does not show a significant difference, but Roman stated that cerclage increases the risk of delivery before 32 weeks gestation as there was a significant difference between the 2 groups and her results were 19.2%, 12.1% in the cerclage group and the control group, respectively. This difference in Roman's study may be due to the inclusion of patients with antepartum hemorrhage in her study while this study excluded them, and also may be due to the significant increase in the maternal age over 35 years in the cerclage group, which is a known risk factor of preterm birth, while this study excluded all patients with an age over 35 years old [20].

In addition, there was no significant difference in this study between mean gestational age at delivery between the two groups with a mean gestational age of 35.03 ± 4.09 gestational weeks, 34.54 ± 5.96 gestational weeks in the cerclage group and the control group, respectively (p=0.379). These results are in agreement with that of Weekes, who compared the mean gestational age at delivery between the three groups, one group is subjected to elective cervical cerclage, the second group was managed by bed rest only and the last one nothing had been done for the patients. He found that the mean gestational age at delivery was 259 ± 20.1 days, 258 ± 19 days and 261 ± 18.3 days in the bed rest group, the cerclage group and the none group, respectively. In addition, Roman has shown that the mean gestation age at delivery was 34.7 ± 3.3 weeks in the cerclage group and was 35.2 ± 2.9 weeks in the control group which is also non significant difference [20,21].

Also, these results agreed with other studies, which showed no significant difference in gestational age at delivery between cerclage group and other groups treated conservatively [22].

Regarding miscarriage, there were 6.7% in the cerclage group and 16.7% in the control group delivered before 28 gestational weeks with no significant difference (p=0.424) which agreed with Roman's study, which showed a percentage of 4.8% in the cerclage group and 3% in the control group, but in this study there is an increase in the percentage of miscarriage in the control group and this may be due to the effect of the fetal reduction procedure that have been done.

There was a significant difference between the 2 groups in the mean birth weight, so that in the cerclage group the mean birth weight was 2.21 ± 0.54 kg, while that in the control group was 2.49 ± 0.51 kg (p=0.003). This result agreed with that of Roman's study who stated that there was a significant difference between the mean birth weight between the 2 groups with a mean birth weight in the cerclage group of 2,140 ± 616 grams and that of the control group was 2,310 ± 635 grams. This is due to the percentage of cases who delivered after 37 gestational weeks was 63.3% in the control group while in the cerclage group the percentage was 43.3% [20].

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