

The Effectiveness of Cervical Cerclage in Preventing Preterm Labor in a Twin Pregnancy

Zainab Alkhaja, MD* Zainab Al-Jufairi, MHPE, FRCOG**

Objective: To evaluate the effectiveness of elective cervical cerclage in reducing the rate of preterm birth in a twin gestation. The secondary objective was to compare the gestational age, neonatal outcome and admission to neonatal intensive care unit (NICU) in a twin gestation with cervical cerclage compared to the control.

Design: A Retrospective Cohort Study.

Setting: Salmaniya Medical Complex, Bahrain.

Method: Twin pregnancy with or without cervical cerclage who delivered between 1 January 2014 and 31 December 2015 were included in the study. A total of 450 women with twin gestation were recruited; 91 with cervical cerclage and 359 without cerclage (control). The age, parity, type of pregnancy, risk factors of preterm delivery, gestational age and neonatal intensive care admission were compared between both groups.

Result: The mean gestational age in women with cervical cerclage was 33.2 weeks \pm 4.9 and the gestational age in women without cervical cerclage was 35 weeks \pm 5.6; the difference was not statistically significant between both groups. One hundred fifty-nine (44%) women without cervical cerclage had delivered between 25-35 weeks of gestation compared to 34 (37.4%) women with cervical cerclage, but the difference between both groups did not reach a significant level (P-value 0.139). However, eight (2.2%) women without cervical cerclage had delivered before 25 weeks of gestation and no women with cervical cerclage delivered at this time.

The newborns of 22 (24.18%) women with cerclage were admitted to the NICU compared to 139 (38.7%) without cerclage. There was a significant difference between both groups regarding newborn admission to the NICU; it was higher among babies of women without cervical cerclage (P-value 0.001).

Conclusion: Elective cervical cerclage in twin pregnancy did not reduce the preterm delivery rate; however, it reduced the admission rate to the NICU and reduced extreme prematurity.

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Twin pregnancies represent approximately 2-4% of all live births; however, the risk of perinatal death and small for gestational age are estimated to be five times higher compared to singleton pregnancies^{1,2,3}. The incidence of preterm delivery (PTD) in a twin pregnancy is approximately 37-60%^{1,2}. In multiple pregnancies, the risk of preterm delivery (PTD) is inversely proportional to cervical length and directly proportional to the degree of funneling; the shorter the cervix and the greater the funneling, the higher the risk of PTD⁴⁻⁶.

Several measures have been used to prevent preterm delivery in multiple pregnancies. These include tocolytics, pessary, bed rest and cervical cerclage. It is unclear whether any intervention reduces this risk⁷. Several studies had been conducted to study the effectiveness of elective cervical cerclage in multiple pregnancies with conflicting results⁸⁻¹³.

Twin pregnancies have a high impact on perinatal outcome

because of preterm births. Other factors that place these pregnancies at even greater risk must be identified⁹.

Goldenberg et al found a cervix of 25 mm at 24 weeks' gestation to be optimal among the best predictors of PTD¹¹.

The aim of this study was to evaluate the effectiveness of elective cervical cerclage in reducing the rate of preterm birth in twin gestation and to compare the gestational age, neonatal outcome and admission to NICU in twin gestation with cervical cerclage compared to the control.

METHOD

Pregnant women with twin gestation who delivered between 1 January 2014 to 31 of December 2015 with or without elective cervical cerclage were reviewed. The data was collected from the registration book in labor room and patients' records. The

* Senior Resident

** Consultant OB/GYN

Department of Obstetrics and Gynecology

Salmaniya Medical Complex

Kingdom of Bahrain

E-mail: Zainab_alkaja@hotmail.com, zainabalkhaja86@icloud.com

following were documented: patient's age, parity, risk factors, gestational age at time of delivery and NICU admission.

The data were coded and SPSS software version 20 was used for statistical analysis. P-value was used for significance, mean and percentage were used for descriptive statistics. Continuous variables were summarized as median and categorical variables were presented as numbers and percentage. The results were expressed as Mean and Proportion (%). Comparisons between women with cervical cerclage and without cerclage were analyzed by Chi-square test for categorical variables.

RESULT

This study included 450 women with and without cerclage who delivered between 1 January 2014 and 31 December 2015. Ninety-one (20.2%) patients with twin pregnancy had cervical cerclage and 359 (79.8%) women did not.

One hundred eighty patients (40%) were >35 years and 134 (29.8%) were in the age group of 31-35 years. Parity ranged from 0 to 6 and 376 (83.6%) women had parity of 0-2. Twin pregnancy was spontaneous in 262 (58%) women, and 188 (42%) were induced pregnancies. Two hundred and one (44.7%) women delivered before 35 weeks of gestation, 249 (55.3%) had deliveries after 35 weeks and 8 (1.8%) before 25 weeks, see table 1.

Table 1: The Socio-demographic Variables of the Patients

Variable	Frequency	Percentage
Age (years)		
20-25	6	1.3%
26-30	130	28.9%
31-35	134	29.8%
> 35	180	40.0%
Total	450	100.0%
Parity		
0	214	47.6%
1	106	23.6%
2	56	12.4%
3	38	8.4%
4	24	5.3%
5	9	2.0%
6	3	0.7%
Total	450	100.0%
Type of Pregnancy		
Spontaneous	262	58.2%
IVF	147	32.7%
Intra Uterine Insemination	9	2.0%
Clomiphene induced	25	5.6%
Gonadotrophin induced	7	1.6%
Total	450	100.0%
Gestational age at delivery time (weeks)		
< 25	8	1.8%
25-35	193	42.9%
> 35	249	55.3%
Total	450	100.0%
Gestational Age (weeks)		
<35	201	44.7%
> 35	249	55.3%
Total	450	100.0%

The mean age of women with cerclage was 34.6 years ±5.04, while the mean age of women without cervical cerclage was 34.07 years ±5.46, 95% CI (-0.67-1.8). There was no significant difference between the age of both groups (P-value=0.362), see table 2.

Table 2: The Age Group of Women with and without Cervical Cerclage

Age in Years	With Cerclage	Without Cerclage	Total	P-value
	No. (%)	No. (%)		
20-25	2 (2.2%)	4 (1.1%)	6 (1.3%)	0.362
26-30	17 (18.7%)	113 (31.5%)	130 (28.9%)	
31-35	34 (37.4%)	100 (27.9%)	134 (29.8%)	
>35	38 (41.8%)	142 (39.6%)	180 (40%)	
Total	91	359	450 (100%)	

The mean gestational age in women with cervical cerclage was 33.2±4.9, 95% CI (-2.7-0.7) and the gestational age in women without cervical cerclage was 34.96±5.63, 95% CI (-2.7-0.7); the difference was not statistically significant between both groups (P-value 0.139). One hundred fifty-nine (35.3%) women without cervical cerclage had delivered between 25-35 weeks of gestation compared to 34 (7.5%) women with cervical cerclage. On the other hand, 8 (1.8%) women without cervical cerclage had delivered before 25 weeks of gestation and no women with cervical cerclage delivered at this time, see table 3.

Table 3: The Gestational Age Group of Women with and without Cervical Cerclage

Gestational age at time of labor	With Cerclage	Without Cerclage	P-value
<25 weeks	0	8 (1.8%)	0.139
25-35 weeks	34 (7.5%)	159 (35.3%)	
>35 weeks	57 (12.7%)	192 (42.7%)	
Total	91 (20.2%)	359 (79.8%)	
450 (100%)			

One hundred sixty-one (35.8%) babies were admitted to NICU; 5 (1.1%) had one of the twin in NICU, and 1 (0.2%) intrauterine death. Twenty-two (4.9%) women with cerclage had their babies admitted to NICU compared to 139 (30.9%) without cerclage, see table 4. There was a significant difference between both groups regarding newborn admission to NICU and it was more amongst babies of women without cervical cerclage (P-value 0.001).

Table 4: NICU Admission in Women with and without Cervical Cerclage

	NICU (161)	%	P value
With cervical cerclage	22	13.7%	0.001
Without cervical cerclage	139	86.3%	
Total	161	100%	

DISCUSSION

Our study shows that cerclage did not reduce the incidence of preterm birth in twin pregnancy because 44% women without

cervical cerclage had delivered between 25-35 weeks of gestation compared to 37% women with cervical cerclage and the difference was not significant (P-value 0.139). However, it prevents extreme prematurity as no women in the cerclage group delivered before 25 weeks of gestation while 8 women in the control group delivered at this time. Han et al concluded that cervical cerclage in twin pregnancies significantly decreased the rate of spontaneous preterm birth less than 32 weeks compared to the expectant management¹⁴. Another study concluded that prophylactic cervical cerclage in 31 twin and 5 triplet pregnancies which (had) undergone fertility treatment had beneficial maternal and neonatal outcome¹³.

Systemic review and Cochrane review showed no statistically significant differences between patients who were randomized to have cervical cerclage or not in preterm birth, live births and mode of delivery. The recommendation was that a large scale randomized controlled trials are needed to strengthen clinical usage of cervical cerclage^{13,14}.

There was a significant decrease in newborn admission to the NICU among babies of women with cervical cerclage compared to the control. This finding was similar to a study by Shehata et al who found that prophylactic cerclage was effective in reducing preterm delivery, neonatal morbidity and mortality in ICSI twins¹⁵. On the other hand, Cochrane review and other studies showed that prophylactic cerclage in twin pregnancy was not associated with a lower risk of preterm birth and adverse neonatal outcomes¹⁴⁻¹⁶.

CONCLUSION

Application of elective cervical cerclage in a twin pregnancy did not reduce significantly preterm delivery rate but it reduced extreme prematurity and newborn admission to the NICU. A large prospective multicenter randomized control study is needed to evaluate the effectiveness of cervical cerclage in preventing preterm delivery.

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