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Original Article

The Benefit of Prophylactic Cervical Cerclage in Twin Pregnancies

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Abstract

Background: Despite the progress in modern obstetric practice, preterm labor is second leading cause of death in the 1st month of life and the main cause of perinatal morbidity and mortality; it remains a difficult problem to prevent, delay or even stop. It occurs in 5%–13% of all pregnancies before 37 weeks' gestation but its incidence in twin pregnancies is about 25%. **Objectives:** This study aimed to determine the effect of prophylactic cervical cerclage (CC) in comparison to others methods: vaginal progesterone and bed rest in prolongation of gestational age in twin pregnancies to prevent preterm labor. **Materials and Methods:** A retrospective descriptive study was conducted between January 2012 and September 2018, in a private obstetric antenatal care clinic in Duhok/Kurdistan Region/Iraq. It involved 150 women with twin pregnancies attending this clinic for follow-up, they divided into: Group 1 (N-86): women who received prophylactic CC; Group 2 (N-44): those who got the vaginal progesterone supplementation of 100 mg from 20 to 34 weeks of gestation; and Group 3 (N-20): those who asked for advisement of bed rest and restriction of physical activity. **Results:** Most of the total sample 95.3% had dichorionic placenta, the majority of them 84.7% were the result of assisted reproductive techniques. There was no statistically significant difference between the three groups in relation to maternal age, gravid, and previous preterm delivery, but there was in relation to the gestational age at delivery. In Group 1, 93% who delivered >37 weeks, whereas 16% and 10% in Group 2 and Group 3 who delivered at this gestational age, respectively. The overall perinatal survival was 91.3% and 26.6% who admitted to Neonatal Intensive Care Unit. **Conclusions:** The current study found that the prophylactic CC was an effective method to prolong pregnancy among women with twin pregnancies.

Keywords: Cervical cerclage, preterm labor, twin pregnancy

Introduction

Twin pregnancies are a high-risk obstetric population and most of the adverse outcome increase in these pregnancies due to preterm labor (PTL). Although maternal-fetal complications and iatrogenic preterm delivery are more common in twin pregnancies, spontaneous labor and preterm premature rupture of the membranes (PPROM) are responsible for three out of four twin preterm deliveries.[1] Preterm delivery is the most important factor detecting the neonatal morbidity and mortality among twins. The risk of preterm birth <37 and <32 weeks' gestation is 8–9 times more in twin than in singleton pregnancy.[2] In order to reduce perinatal complications, the recognition of twin pregnancies at high risk of preterm delivery, and the prolongation of those pregnancies must be attained.[1]

Several interventions have been used to reduce the rate of preterm birth in a twin pregnancy, such as bed rest, prophylactic tocolysis, nutritional advice, administration of 17α-hydroxyprogesterone caproate, vaginal progesterone, cervical pessary, and CC. Unfortunately, these interventions have not been shown to reduce the risk of preterm birth in unselected twin pregnancy.[3]

There is an evidence of the association between decreasing second-trimester cervical length, as measured by transvaginal ultrasound (TVS), and increased the risk of spontaneous PTL in twin pregnancies.[4] However, an effective intervention to be applied once cervical shortening has been detected is yet to be identified. The use of CC to prevent PTL is still controversial, especially in multiple pregnancies.[5]

Bed rest used to be advised for women with multiple pregnancies; a study was done at hospital to assess the effect of it for the women with multiple pregnancies to prevent PTL

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and improve other fetal, neonatal and maternal outcomes. The results revealed that there was not enough evidence to support the policy of routine hospitalization for bed rest in multiple pregnancies and no reduction in the risk of preterm birth, although there is an approach that fetal growth may be bettered, so this strategy cannot be suggested as routine clinical plan.[6]

Several randomized studies have administrated the evidence that progesterone supplementation can result in a significant reduction of PTL and neonatal morbidity and mortality.[7] CC has reduced the risk of PTL for a selected population of singleton pregnancies, as those with a history of preterm birth and a shortened cervix. About half of the twin pregnancies deliver preterm, and it is unclear whether any intervention reduces this risk. After all, the quest is ongoing for a logical preventive method of preterm delivery in twin pregnancies.[8]

Twin pregnancy has become more prevalent in developed countries over the last decades.[9] Rapid advances in assisted reproductive techniques (ART) procedures and gonadotropin stimulation protocols were linked with a significant increase in the incidence of multiple pregnancies with the incidence of 30%–35% for twins and 5%–10% for triplets.[10,11] These pregnancies have more and more complications as result of ART procedures rather than spontaneous pregnancies, so proper surveillance during pregnancy should be considered for intra-cytoplasmic sperm injection (ICSI) twin pregnancies because their antenatal and neonatal complications were found to be higher.[12,13] The increased rate of complications in ICSI twins is still unclear, and many explanations owed these complications either to ART characteristics of the infertile couple or the underlying infertility.[14] In twins, CC is an intervention aiming to prevent cervical shortening and opening, by that reducing the risk of preterm birth. The effectiveness and safety of this procedure in multiple pregnancies remain controversial,[10] where some studies supported its use and others form that it has some benefit.[11,12] However, other studies stated that it seems to be ineffective in reducing PTL, and detected some complications owing to its use.[13,14]

The approximate mean gestational age at delivery is 36 weeks for twin and 33 weeks for triplet pregnancies. The pathophysiology of preterm birth in multiple pregnancies remains unclear; the most common cause is overdistension of the uterus.[15]

In spite of the advance in modern obstetric practice, PTL remains a difficult problem to prevent, stop or even delay in higher-order pregnancies.[16,17] Moreover, routine prophylactic CC has been approached as a policy for prolonging gestation, and some evidence exists the suggesting that its routine use in twin pregnancies is beneficial.[18]

Materials and Methods

A retrospective descriptive study was conducted between January 2012 and September 2018, in a private obstetric antenatal care clinic in Duhok/Kurdistan Region/Iraq. It involved all the women with twin pregnancies attending this clinic for follow-up and were under the direct supervision of consultant obstetrician through regular visits during their pregnancy.

A review was conducted of the electronic patient databases of (150 participants). All women were assessed and subjected to a comprehensive history taking, the following variables were reviewed: age, parity, and body mass index, type of infertility, duration of infertility, previous obstetric history and history of previous cervical insufficiency, cervical surgery, PTL or PPROM; and number of fetuses and method of conception. Complete clinical examinations and were investigated by the routine investigation to check for general condition CBC, fasting blood glucose, virology study, urine analysis, and culture. TVS was done at the first trimester to detect a number of fetuses, viability, cervical length, and diameter, to exclude fetal congenital anomalies by the nuchal translucency and nasal bone measurement scan, and uterine anomalies or fibroid.

Obstetrics outcomes measures included: The incidence of PTL, PPROM, neonatal or intrauterine fetal death, admission to the neonatal intensive care unit (NICU), gestational age at delivery; and the mode of delivery. Information about the aims of CC in a twin pregnancy, its procedure, the associated benefits and risks with complications of prematurity were explained and discussed with all of them. The women were categorized into three groups for statistical analysis according to whether they had received prophylactic CC or vaginal progesterone use or bed rest as:

Group 1 (N-86): Women who received prophylactic CC, the suture was placed into and around the cervix at between 13 and 16 gestational weeks, regardless of the past obstetric history or the state of the cervix. All cerclage sutures were of the McDonald method, using 5 mm MERSILENE® polyester tape (Ethicon Inc., Austria), which is a sterile nonabsorbable polyester tape, 50 cm in length, 5 mm width with double needles to minimize infection, and were inserted under general anesthesia, and empty bladder, including 4 bites in the cervix all-around at the level of internal os without bladder mobilization avoiding 3 and 9 o'clock to prevent suspected bleeding due injury of cervical branches of uterine artery.

Following the procedure, patients received an ultrasound to check fetal well-being before being discharged on the next day, with instructions to seek attention at the emergency room if they experienced any symptomatic abnormalities. Patients were also advised to avoid demanding physical activities but were not assigned complete bed rest. A follow-up visit to the antenatal clinic was arranged 2 weeks later to assess the state of the cervix. Patients were then seen regularly until the elective removal of the suture, or earlier in the case of an emergency. Most of the CC sutures were removed during the 36th gestational week without sedatives or any form of anesthesia. No antimicrobial or tocolytic medications were administered.

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Group 2 (N-44): Those who refused the CC and choice to receive the vaginal progesterone supplementation of 100 mg from 20 to 34 weeks of gestation.

Group 3 (N-20): Those who ask for advisement of bed rest and restriction of heavy physical activity.

The outcome measures included the occurrence of spontaneous PTL between 34 and 37 weeks and parameters of neonatal morbidity and mortality. The assessment excluded: Malformed babies, uterine anomalies, uterine myoma, incompetent cervix, short cervix, cervical lesions as myoma, polyp or laceration, previous cervical surgery, patients with active cervicitis, threatened abortion with vaginal bleeding and any patient with medical disorders.

All patients were followed up periodically. In Group 2 and 3, the observation was applied for patients with documentation of any use of antibiotics or tocolytic drugs. Follow-up was conducted for all participants every 2–28 weeks then weekly until delivery by sonographic measurement of cervical length and reviewing symptoms of PTL, PPROM, bleeding, fever, or vaginal discharge. The examination was done to check for general condition and any signs of infection.

The outcome measures included the occurrence of spontaneous PTL <34, between 34 and 37, and >37 weeks of gestation, PPROM, and parameters of neonatal morbidity and mortality.

Transabdominal ultrasound for fetal biometry, growing problem, amniotic fluid volume, and fetal demise. Umbilical Doppler was done to detect any abnormalities in blood flow or twin to twin transfusion and assess fetal wellbeing besides biophysical profile. Monitoring for infections every 2 weeks by (C-reactive protein and total leukocytic count) was performed to detect signs of infection. Antenatal corticosteroids, (Dexamethasone 12 mg every 12 h for 2 doses) were administered intramuscularly at 28 weeks and 48 h before plan cesarean section (CS) to promote fetal lung maturation.

The cerclage stitch was removed if PPROM occurred, established PTL or when pregnancy reached 37 weeks. The need for hospitalization and duration of admission, the occurrence of PTL and its time, the time of PPROM and the need for adjuvant drugs such as antibiotic or tocolytics were recorded. Then, the fetal complications, for example, intrauterine growth restriction, fetal demise and twin to twin transfusion syndrome, gestational age at delivery, and type of delivery (vaginal or CS) were recorded. For patients in the three groups, decisions regarding the timing and mode of delivery and pain relief options offered during labor were made accordingly.

Neonatal assessment included birth weight, Apgar score (mean of Apgar score at 1 and 5 min), neonatal mortality and morbidity which include: Respiratory distress Syndrome (RDS), neonatal sepsis (NS), and the need for NICU and therapies as ventilation, blood transfusion, and phototherapy were recorded for each twin.

Results were tabulated and statistically analyzed by SPSS 23 (IBM, Anas Company, Iraq), with the utilization of descriptive statistics as percentages, mean, and analytic statistic parameters such as Chi-square, *t*-test, and the level of statistical significance was set at $P \leq 0.05$.

This study has received acceptance of committee of medical ethics from the Directorate General of Health in Duhok city.

Results

A total of 150 women with twin pregnancies were seen at the private clinic in Duhok, during the study period. Clinical characteristics of the three groups, including maternal age, gravida, parity, previous abortion and uterine surgery, history of PTL, chorionicity, history of infertility, and use of ART were described in Table 1.

In Group 1, 86 women (57.3%) underwent a prophylactic CC insertion procedure, in Group 2, 44 women (29.3%) received vaginal progesterone supplementation of 100 mg from 20 to 34 weeks of gestation, and in Group 3, 20 women (13.4%) those who asking for advisement of bed rest and restriction of daily activity.

Most of the 143 (95.3%) of the total sample had dichorionic placenta, and there was no statistical difference, the ($P = 0.389$). The majority of the pregnancies 127 (84.7%) were the result of ART, mainly ICSI and embryo transfers; (90.7%) of women in Group 1, versus (76.6%) of women in Group 2 and 3 had used ART ($P \leq 0.001$). After adjusting the statistical analysis for the three groups, the high significant difference was ($P \leq 0.001$) for ART, and ($P = 0.01$) for a history of infertility.

There was no statistically significant difference between the three groups in relation to maternal age ($P = 0.654$), previous preterm delivery ($P = 0.497$), gravida ($P = 0.101$), and previous uterine surgery ($P = 0.576$). In addition, the mean gestational age at cerclage in Group 1 was 14^{+3} (13^{+5}–16^{+0}).

The overall incidence of vaginal and endocervical colonization was 14% (21/150): 14% (12/86) in Group 1, 13.6% (6/44) in Group 12, and 15% (3/20) in Group 3.

The incidence of PTL and PPROM was analyzed in the three groups: In Group 1, comparing the cases with negative swabs (86%; $n = 74/86$) and positive (14%; $n = 12/86$) swab cultures. Cases with negative swabs trend for a better outcome (reduced PPROM risk) than the group with positive swabs: The incidence of PTL was 2.7% (2/74) and 33.3% (4/12); the incidence of PPROM was 5.4% (4/74) and 16.6% (2/12) in the –ve group and +ve cultured swab, respectively.

In Table 2, the median gestational age at delivery was (37+3, 35+6, 34+5 weeks) in Group 1, 2, and 3 respectively, Moreover, the majority of Group 1 (93%), (16%) of Group 2, and (10%) of Group 3 were delivered at > 37 weeks of gestation ($P \leq 0.001$).

In relation to the mode of delivery, all of the women delivered by CS after 34 gestational weeks, with the majority of cases,

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Table 1: Maternal clinical characteristics of women with twin pregnancy (total 150)

Maternal characteristic	Group 1 ($n=86$), n (%)	Group 2 ($n=44$), n (%)	Group 3 ($n=20$), n (%)	P
Mean age maternal (years)	32 (22-42)	30 (21+38)	30 (24+36)	0.654
Gravity				
Nulliparity	36 (41.9)	22 (50.0)	5 (25.0)	0.101*
Parity	27 (31.4)	12 (27.3)	12 (60.0)	
Previous abortion	23 (26.7)	10 (22.7)	3 (15.0)	
Previous uterine surgery				
Yes	13 (15.1)	4 (9.0)	2 (10.0)	0.576*
No	73 (84.9)	40 (91.0)	18 (90.0)	
Previous preterm delivery				
Yes	7 (8.1)	2 (4.5)	0 (0.0)	0.497**
No	79 (91.9)	42 (95.5)	20 (100)	
Positive cultures + antibiotic	12 (14.0)	6 (13.6)	3 (15.0)	-
Type of twin				
Di-chorionic placenta	83 (96.5)	42 (95.5)	18 (90.0)	0.389**
Mono-chorionic placenta	3 (3.5)	2 (4.5)	2 (10.0)	
History of infertility				
Yes	75 (87.2)	32 (72.7)	12 (60.0)	0.011*
No	11(12.8)	12(27.3)	8(40.0)	
Use of ART				
No	8 (9.3)	5 (11.4)	10 (50.0)	≤0.001*
Yes	78 (90.7)	39 (88.6)	10 (50.0)	

Data are shown as: *χ^2, **Fisher test. n (%), Mean (range)

93% of women in Group 1 delivered by elective CS, (7%) by emergency or urgent procedures, whereas 16% and 61.3% in Group 2 delivered by elective and urgent, respectively. There was a statistically significant difference between the three groups in relation to the mode of delivery ($P \leq 0.001$).

There was a significantly higher gestational age at delivery in Group 1 when compared to either 2 or 3 groups ($P \leq 0.001$). Conversely, there was a statistically nonsignificant difference between progesterone and bed rest groups.

Moreover, the gestational age at delivery among the three groups has been stratified into three levels: <34 weeks, 34–37 weeks and >37 weeks as shown in Table 2. There was a significantly higher percentage of gestational age <34 weeks and 34–37 weeks (84% and 90%) in Group 2 and Group 3, respectively.

Regarding the neonatal outcomes in Table 2, the overall perinatal survival was 91.3% (137/150) and 40 (26.6%) admitted to NICU, the birth weight (g) demonstrated the intergroup comparison of estimated birth weights. Group 2 and 3 have shown significantly lower birth weight (2100 g, 1850 g) respectively, than in CC (2315 g). A statistically significant lower Apgar score (50% and 65%) was shown in Group 2 and Group 3 respectively than (11.7%) in Group 1, with ($P \leq 0.001$).

The NICU admission for different indications mainly (breathing difficulty, NS), there was a significantly higher rate of NICU admission among Group 2 and 3 (45.5% and 70%) respectively than in Group 1 (7%) with $P \leq 0.001$. The same results about RDS and sepsis as causes of admission to NICU, they were (56.8%, 11.3%, and 75%, 15%), respectively, in Group 2 and 3 while 23%, 2.3%, in Group 1 ($P = 0.023$).

Discussion

PTL is the most usual complications of twin pregnancies due to its bad health problem and economic effects. In this study the CC was done in 86 cases and 64 cases were treated conservatively without cerclage (44 by progesterone vaginal tablet and 20 as bed rest). Demographic Characteristics data (age, type of Twin, gravida, previous obstetric history as preterm, previous uterine surgery and positive culture) were nearly similar with no significant difference in the three groups.

The rate of twins pregnancy has risen substantially over the past three decades.[19] They are between 4 and 5 times more likely to deliver than singletons before 32 weeks of gestation.[20] Twin and multiple pregnancies are increasing nowadays due to the progress and advanced in ART technologies, and these pregnancies are designed high-risk pregnancies due to the many complications that happen during or after the pregnancy either to the mother, fetus, or newborn.[21,22]

Ideally, there may be higher pressure on the cervix, especially on the internal opening of the cervix, in cases of twin multiple pregnancies in comparison to singleton pregnancies.[17] The routine prophylactic CC procedure for women with twin or multiple pregnancies should automatically decrease the occasions of PTL by preventing cervical shortening and dilatation. PTL is the most common complication in these

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Table 2: Pregnancy outcomes among women with twin (*n*=150)

Outcome	Group 1 (*n*=86), *n* (%)	Group 2 (*n*=44), *n* (%)	Group 3 (*n*=20), *n* (%)	*P*
PPROM				
Yes	6 (7.0)	10 (22.7)	12 (60.0)	≤0.001*
No	80 (93.0)	34 (77.3)	8 (40.0)	
Gestational age at delivery (weeks)	36+6 (36+1-37+3)	35+6 (34+37+1)	34+5 (34+3-37+0)	
<34	0	4 (9.0)	7 (35.0)	≤0.001**
34-37	6 (7.0)	33 (75.0)	11 (55.0)	
>37	80 (93.0)	7 (16.0)	2 (10.0)	
Birth weight (g)	2315 (1650-2980)	2100 (1500-2700)	1850 (1600-2100)	
Mode/indication of delivery				
Vaginal delivery	0 (0.0)	10 (22.7)	6 (30.0)	≤0.001**
Elective C/S	80 (93.0)	7 (16.0)	2 (10.0)	
Urgent C/S due to labour	6 (7.0)	27 (61.3)	12 (60.0)	
Neonatal deaths/stillbirths				
No death	85 (98.8)	41 (93.3)	11 (55)	≤0.001**
Two death	0	1 (2.2)	2 (10)	
At least one	1 (1.2)	2 (4.5)	7 (35)	
NICU admissions				
Admitted	6 (7.0)	20 (45.5)	14 (70.0)	≤0.001*
At least one	16 (18.6)	10 (22.7)	4 (20.0)	
Not admitted	64 (74.4)	14 (31.8)	2 (10.0)	
Apgar score				
<5	10 (11.7)	22 (50.0)	13 (65.0)	≤0.001*
>5	76 (88.3)	22 (50.0)	7 (35.0)	
RDS				
Yes	20 (23.2)	25 (56.8)	15 (75.0)	≤0.001*
No	66 (76.8)	19 (43.2)	5 (25.0)	
Sepsis				
Yes	2 (2.3)	5 (11.3)	3 (15.0)	0.023**
No	84 (97.7)	39 (88.7)	17 (85.0)	

*χ^2, **Fisher test. NICU: Neonatal intensive care unit, RDS: Respiratory distress syndrome, PPROM: Preterm premature rupture of the membranes

women with multiple pregnancies. Several measures were tried to prevent PTL in multiple pregnancies such as bed rest, progesterone, prophylactic tocolysis, and prophylactic cerclage, but none were 100% effective.[23,24]

Although there was no beneficial or definite intervention method for the prevention of preterm birth and its sequel in twin gestations.[25] Neither cerclage nor pessary has been proven an effective intervention for preventing preterm births and decreasing the perinatal deaths in twin pregnancies.[18] However, vaginal progesterone provided some important secondary outcome. Ultrasonographic assessment of cervical length has long been seen to have good efficacy in predicting preterm delivery in twin pregnancies as in singletons. The two main ways of therapy to decrease the risk of preterm delivery in singletons with a short cervix, CC, and progesterone therapy, which has the same outcomes in twins. Although there is no strong evidence that either intervention reduces the risk of preterm delivery in twin gestations complicated by the short cervix.[26]

Not going with the present study, some other trials found that neither progesterone nor cerclage alone has detected any positive impact on preventing preterm delivery and improving the perinatal morbidity and mortality.[18,27,28] However, other studies considered that CC was an effective method.[24,25,29,30] In view of other findings among different studies which mentioned the efficacy of the combination of both treatments was a logic target to avoid PTL.

By using many meta-analyses, some studies support that twins conceived by ART have a higher risk of adverse pregnancy complications and neonatal morbidity and mortality.[13,21,31-33] other studies denied the evidence of a higher incidence of adverse outcomes.[34] Research studies on minimizing or preventing PTL in twins are less clear, due to fewer numbers being investigated and contradictory results. The studied prophylactic interventions were cerclage, progesterone and vaginal pessaries which had increasingly benefit in singleton pregnancies with a short cervix.[35]

Monochorionic pregnancies showed a trend towards a higher incidence of PTL before 34 weeks; however, the small number of cases was again too small to confess any more analyses.[1] The same in this study.

Most of the studies on CC in twin pregnancies did not exclude the presence of cervicovaginal colonization before performing a CC, although infections are reported as one of the major

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causes of preterm delivery, so it is important of detecting microbial colonization.[1] In this study, the incidence of vaginal colonisations was 14% in the CC group and around 29% in the other two groups and antibiotic therapy was often started before getting the swab results.

The possibility of preterm birth can be evaluated by reviewing the past obstetric history and carrying out a speculum or digital vaginal examination or reviewing abdominal and vaginal ultrasound findings in the second trimester. However, the role of the cervix in the etiology of preterm birth in multiple pregnancies is not clear. The insertion of CC sutures for patients with ultrasonographically-documented cervical shortening has been proposed so as to avoid unnecessary surgery. On the other hand, its effectiveness and safety in multiple pregnancies remain unclear.[18] Some studies have found that prophylactic cerclage significantly increases the mean gestational age and decreases the incidence of prematurity.[17]

Although routine prophylactic CC is not recommended for every woman with multiple pregnancies and the safety and efficacy of this method as a kind of preterm delivery prevention should be depended on a case-by-case according to the obstetric history and cervical assessment.[15,36] In a study of the current practices to prevent preterm births, Baker *et al*. found that the majority of Canadian specialists (82%) recommended routine cervical length assessment at 16–21 gestational weeks, with none supporting routine cerclage insertion; however, 71% stated that they would perform cerclage based on the patient's history or an ultrasound.[15,37]

The mean gestational age in this study was (36 + 6 weeks), (35.6 weeks), and (34.5 weeks) in Group 1, 2, and 3 respectively, which indicates the significant effect of cerclage in prolonging gestation. Neonatal birth weight mean was (2315 g) in the cerclage group versus (2100 and 1850 g) in Group 2 and 3. These results were lower than that of Mamas and Mamas[38] who conducted a study on 31 twin pregnant women using the modified shirodkar procedure and reported a mean gestational age of 35 ± 4 weeks in twin pregnancy at the time of delivery. The same authors detected the mean birth weight of 2352 g in twins which is nearly similar to our results. Another study conducted by Roman *et al*.[39] reporting that the mean gestational age at delivery was (34.7 weeks) in the cerclage group while the mean in noncerclage group was (35.2 weeks) with neonatal birth weight in cerclage group was (2140 g) versus (2310 ± 635 g) in noncerclage group. The authors denied the efficacy of prophylactic cerclage in improving pregnancy outcome in twins. Another study was done by Galindo *et al*.[40] conducted a study on 129 patients carrying twin pregnancy resulted from ART where prophylactic cerclage (McDonald technique) was performed in 46 while the remaining 83 served as controls. There was a significant difference in gestational age in weeks (35.65 ± 1.96 vs. 33.79 ± 5.28, $P < 0.05$), average weight in g (2358.8 ± 462.73 vs. 2103.90 ± 711.78, $P < 0.05$). They concluded that patients with prophylactic cerclage had better gestational age and better birth weight compared to those without cerclage and should be considered as routine in twin pregnancies from ART, especially more than 127 (84.7%) of all women in this study got pregnant by ART, The majority 78 women in Group 1 conceived by this method and preferred the cerclage method due to their infertility and 80 (93%) of them delivered by elective C/S due to this point.

RDS occurred in (23.2%) in cerclage group versus (56.8% and 75%) in Group 2 and 3, with the need of NICU admissions (7%) in Group 1 versus (50% and 65%) in Group 2 and 3, respectively. This means a significant increase in respiratory distress in other 2 group cases than in the cerclage group. Moreover, the total admission to NICU in the present study was (46.7%). Mamas and Mamas[38] reported that half the neonates (51.6%) delivered from twin pregnancies were admitted to the NICU. Hansen *et al.* reported that 60% required NICU admission.[41] Roman *et al*.[39] reported (42.8%) NICU admission to cerclage versus (38.1%) in noncerclage group.

Neonatal mortality was lower in the cerclage group (1.2%) than in Group 2 and 3 (6.7%) and (45%), these results were opposite to the study done by Rafael, *et al*.[18] who reported perinatal deaths (19.2%) in cerclage versus (9.5%) in noncerclage group. A recent study was conducted by Collins and Shennan[35] to evaluate the role of cerclage, progesterone and cervical pessary in the prevention of PTL in twins and stated that the role of cerclage in twins has not been adequately researched in women with previous preterm birth, and should not be used on the basis of a short cervix only allowing flexibility of its prophylactic use. That study concluded that cerclage, vaginal pessaries, and progesterone should not be routinely used in twin pregnancies without an additional high-risk factor such as prior history of preterm birth or short cervix until further evidence is obtained.[42]

Even the studies not advocating the use of prophylactic cerclage in multiple pregnancies pointed to some benefit of cerclage in 3 aspects the first aspect is prolonging gestation till corticosteroid therapy is given if PTL or PROM occurred,[38] the second aspect is that it allowed obstetricians to avoid the emergency need for cerclage which proved to be of no value.[43,44] The third aspect is that cerclage permit-free activity of patients and minimized bed rest with its psychological and economic effects.[38]

Conclusions

Prophylactic cerclage seems to be effective in reducing the preterm delivery and minimized neonatal morbidity and mortality. Its results were much better compared to progesterone use and bed rest in improving both gestational age and perinatal outcomes in twin pregnancies.

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Conflicts of interest

There are no conflicts of interest.

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