Study the related of the impact factors of social characteristics of pregnancy women with cerclage sequence in Tikrit city.

Nabella K yakoob 1, Sammar Mounther Jamal2 and Nihad Khalawe Tektook3

1,2 Department of obstetrics and Gynaecology, College of Medicine, Tikrit University
3 Middle Technical University - Collage of Medical & Health Technology - Baghdad - Iraq.

Email : drnihadkhalawe@gmail.com

Abstract. The mainstay of treatment for cervical incompetence is a surgical procedure, namely cervical cerclage. This entails the placement of a surgical suture around the cervix as close as possible to the level of the internal cervical os. This A cross sectional study conducted in Obstetrics and Gynecology ward and outpatient clinic in Salah Al-Din Teaching Hospital at the period from the first of March 2018 to the end of August 2018. Convenience sample of (120) women in different ages. Mean BMI of pregnant women was (31 ± 5 Kg/m2); 8.3% had normal BMI, 35% were overweight and 56.7% of them were obese. Urban residence was observed in 70.8% of pregnant women. Smoking of husbands, Diabetes mellitus was recorded for one pregnant woman only and hypertension was observed in 10 pregnant women. No significant difference was observed between pregnant women with 1st cerclage and those with previous cerclage regarding BMI and occupation of pregnant women. There was significant association between urban residency and recurrent cerclage (p=0.005). A significant association was observed between women with husband smoking and 1st time cerclage (p=0.02). Cervical incompetence and recurrent 2nd trimester pregnancy was the significant indication for recurrent cerclage while preterm labour was the significant indication for 1st cerclage (p<0.001). A significant association was observed between rescue indication and 1st time cerclage (p=0.005). Most pregnant women were obese, Urban residence was high observed in of pregnant women. No significant difference between pregnant women with 1st cerclage and those with previous cerclage regarding BMI and occupation of pregnant women, but significant association between urban residency and recurrent cerclage (p=0.005), also significant association between women with husband smoking and 1st time cerclage (p=0.02). Cervical incompetence and recurrent 2nd trimester pregnancy was significant indication for recurrent cerclage while preterm labour was the significant indication for 1st cerclage (p<0.001), and significant association between rescue indication and 1st time cerclage (p=0.005).

Keywords : impact factors ; social characteristics ; pregnancy women ; cerclage sequence ; tikrit city.

Introduction:
Every year, an estimated 15 million babies are born Preterm birth (PTB) (before 37 completed weeks of gestation), and this number is rising. Preterm birth complications are the leading cause of death among children under 5 years of age, responsible for approximately 1 million deaths in 2015. Three-quarters of these deaths could be prevented with current, cost-effective interventions. Across 184 countries, the rate of preterm birth ranges from 5% to 18% of babies born (9).

Complications of Preterm birth are now the second most common cause of death after pneumonia in children under 5 years of age. Furthermore, Preterm birth results in both immediate and long term morbidity in the neonate and child(10). Consequently leading to huge socio-economic burdens and continued psychosocial and emotional stress on families(11).

Prevention and treatment strategies of Preterm birth have been rather ineffective and disappointing. However, one specific aspect of the preterm birth spectrum that has a known surgical intervention is cervical incompetence or cervical insufficiency as it is sometimes known. Cervical incompetence is defined as the painless dilation of the cervix during the second trimester of pregnancy leading to spontaneous Preterm birth (or late miscarriage) of a live and otherwise healthy fetus. Cervical incompetence affects 0.1 – 2.0% of the global obstetric population and 8% of women with recurrent 2nd trimester losses(4). In developing countries it accounts for up to 15 - 20% of pregnancy losses(5). The mainstay of treatment for cervical incompetence is a timely surgical intervention, which involves the placement of a surgical suture around the cervix to prevent miscarriage or Preterm birth(12).

**Patients and methods:**

**Ethical consideration:** The study was approved by the ethical committee of the Ministry of health scientific council and Tikrit Medical College. The purpose and procedures explain to all participants and were give the right to participate or not, verbal consent was taken with reassurance that interpret gained will be kept confidentially and not to be used for other research object.

**Study design and setting:** A cross sectional study conducted in department of Obstetrics and Gynecology in Salah El-Din teaching hospital at the period from the first of March 2018 to the end of August 2018.

**Study subjects:**

The Study included (120) married women in different ages, with mean age of (31±6) years attending SalahAl-Din Teaching hospital obstetrical ward and gynecological and obstetrical out patients clinic who are willing to participate in this study and available at the time of data collection selected convenience sampling method.

**Inclusion criteria:** The study included 120 married women in their reproductive age with mean age of (31±6 years) and their parity between 1-6.

**Exclusion criteria** Pregnant women who did not do cervical Cerclage did not included in this study.

**Data collections:** Data was collected from subjects via modifiable questionnaire form put it and modified by assistance of supervisor senior. Questionnaire lashed the women about their information (socio-demographic, obstetrical history indication for cerclage, pregnancy outcome, maternal complications, neonatal outcome and complications, medical and surgical history, and drug history) and their phone number and ask about timing of cerclage (gestational age) , done by who by direct interview between researcher and women after that clinical examination done first I take a permission from the women to do the vaginal examination after explain nature and the cause of the examination.

Then women laydown in lithotomy position, by use good light and vaginal speculum to visually inspect the cervix for previous scarring, deformity and length to ascertain the feasibility of placing
transvaginal cerclage and send to informed ultrasound to confirm viability of fetus and gestation and cervical length. And to rule out major congenital anomalies and the results recorded.

Statistical analysis: Data presented by simple tables, the analysed to test significance by using manual statistical analytic methods.

Results
Mean BMI of pregnant women was (31 ± 5 Kg/m²); 8.3% had normal BMI, 35% were overweight and 56.7% of them were obese. Urban residence was observed in 70.8% of pregnant women. Smoking of husbands was shown in 60% of studied pregnant women. these findings were shown in table 1.

| Table 1: BMI and social characteristics of the sample. |
|------------------------------------------------------|
| BMI mean±SD (31 ± 5 Kg/m²)                           |
| Normal                                              | 1 8 |
| Overweight                                         | 4 3 |
| Obese                                              | 6 5 |
| Total                                              | 1 1 |
| Residence                                          |
| Rural                                              | 3 2 |
| Urban                                              | 8 7 |
| Total                                              | 1 1 |
| Smoking                                            |
| Husband                                            | 7 6 |
| None                                               | 4 4 |
| Total                                              | 1 1 |

There was a highly significant association between high gravidity and recurrent cerclage (p<0.001). A highly significant association was observed between women with high parity and recurrent cerclage (p<0.001). There was a significant association between high abortion history and recurrent cerclage (p=0.01). No significant difference was observed between pregnant women with 1st cerclage and those with previous cerclage regarding previous CS and way of GA estimation. A significant association was observed between women with younger GA and 1st time cerclage (p=0.001). All these findings were shown in table 2.

| Table 2: Distribution of women’s obstetrical history according cerclage sequence. |
|-------------------------------------|----------------|----------------|----------------|----------------|----------------|
| Variable                           | 1st cerclage   | Previous cerclage | P       |                |
|                                     | No. | %   | No. | %   |                |
| Gravidity                          |      |      |      |      |                |
| 1-2                                 | 15.4 | 2   | 3.6 |      | <0.001*       |
| 2-4                                 | 55.4 | 13  | 23.6|      |                |

*χ²=22.9, df=2
No significant difference was observed between pregnant women with 1st cerclage and those with previous cerclage regarding BMI and occupation of pregnant women. There was significant association between urban residency and recurrent cerclage (p=0.005). A significant association was observed between women with husband smoking and 1st time cerclage (p=0.02). All these findings were shown in table 3.

Table 3: Distribution of women’s BMI and social characteristics according to cerclage sequence.

| Variable       | 1st cerclage  | Previous cerclage | P       |
|----------------|---------------|-------------------|---------|
|                | No. | %     | No. | %     |         |
| BMI            |     |       |     |       |         |
| Normal         | 6.2 | 6     | 10.9|       | 0.6* NS |
| Overweight     | 36.9| 18    | 32.7|       |         |
| Obese          | 56.9| 31    | 56.4|       |         |
| Residence      |     |       |     |       | 0.005* S|
| Rural          | 40.0| 9     | 16.4|       |         |
| Urban          | 60.0| 46    | 83.6|       |         |
| Occupation     |     |       |     |       | 0.5* NS |
| Housewife      | 69.2| 35    | 63.6|       |         |
| Employee       | 30.8| 20    | 36.4|       |         |
| Smoking        |     |       |     |       | 0.02* S |
| Husband        | 69.2| 27    | 49.1|       |         |
| None           | 30.8| 28    | 50.9|       |         |

* Chi-square test, NS=Not significant, S=Significant.
Cervical incompetence and recurrent 2nd trimester pregnancy was the significant indication for recurrent cerclage while preterm labour was the significant indication for 1st cerclage (p<0.001). A significant association was observed between rescue indication and 1st time cerclage (p=0.005). All these findings were shown in table 4.

| Variable | 1st cerclage | Previous cerclage | P |
|----------|--------------|-------------------|---|
| Indication for cerclage | No. | % | No. | % |
| Cervical incompetence | 12 | 18.5 | 6 | 11.1 |
| Recurrent 2nd trimester pregnancy losses | 11 | 16.9 | 5 | 9.3 |
| Preterm labour | 8 | 12.3 | 0 | - |
| Cervical incompetence and recurrent 2nd trimester pregnancy losses | 23 | 35.4 | 11 | 20.4 |
| Cervical incompetence and preterm labour | 20 | 30.8 | 6 | 11.1 |
| Recurrent 2nd trimester pregnancy losses and preterm labour | 19 | 29.2 | 5 | 9.3 |

Cervical incompetence is depending on:
| History | US indicated | Rescue | History and US indicated |
|---------|--------------|--------|--------------------------|
| 11 | 16.9 | 7 | 12.7 |
| 21 | 32.3 | 9 | 16.4 |
| 11 | 16.9 | 3 | 5.5 |
| 32 | 49.2 | 16 | 29.1 |

*Chi square test, S= Significant.

Discussion:

Present study revealed that high gravidity, parity and abortion history is significantly related to recurrent cervical cerclage. This finding is similar to results of Tamrakar et al (60) study in Nepal which documented that increased parity history and abortion history are risk factors for recurrent cervical incompetence.

Younger gestational age of pregnant women in this study was a significant risk factor for 1st time cervical cerclage. This finding coincides with results of Chan et al (61) study in Hong Kong which found that cervical cerclage in first time is correlated directly with mid-trimester pregnancy. The 1st time cervical cerclage is associated significantly with rural residency and husband smoking. Similarly,
Karau et al\(^{(14)}\) study in Kenya found a positive relationship between smoking behavior of women and/or their husbands with high rates and poor outcomes of cervical cerclage.

References

[1] Alfirevic Z, Stampalija T, Roberts D, Jorgensen AL. Cervical stitch (cerclage) for preventing preterm birth in singleton pregnancy. Cochrane database of systematic reviews. 2012(4).
[2] Alfirevic Z, Stampalija T, Medley N. Cervical stitch (cerclage) for preventing preterm birth in singleton pregnancy. Cochrane Database of Systematic Reviews. 2017(6).
[3] Draper ES, Manktelow B, Field DJ, James D. Prediction of survival for preterm births. BMJ: British Medical Journal. 2000 Jul 22;231(755):237.
[4] Blencowe H, Cousens S, Oestergaard MZ, Chou D, Moller AB, Narwal R, Adler A, Garcia CV, Rohde S, Say L, Lawn JE. National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications. The Lancet. 2012 Jun 9;379(9832):2162-72.
[5] Petrou S. Economic consequences of preterm birth and low birthweight. BJOG: An International Journal of Obstetrics & Gynaecology. 2008 Apr;110:17-23.
[6] Owen J, Hankins G, Iams JD, Berghella V, Sheffield JS, Perez-Delboy, et al. Multicenter randomized trial of cerclage for preterm birth prevention in high-risk women with shortened midtrimester cervical length. American journal of obstetrics and gynecology. 2009 Oct 1;201(4):375-e1.
[7] Tran PL, Payet G, Barau G, Boukerrou M. Cervical cerclage in Reunion island: Evaluation of physicians' practice patterns. Journal de gynecologie, obstetrique et biologie de la reproduction. 2016 Sep;45(7):731-7.
[8] Brown R, Gagnon R, Delisle MF, Bujold E, Basso M, Bos H, et al. Cervical insufficiency and cervical cerclage. Journal of Obstetrics and Gynaecology Canada. 2013 Dec 1;35(12):1115-27.
[9] Okun N, Mitchell BF, Willan AR, Armson BA, Hannah M. Perspectives on the management of the short cervix identified by transvaginal ultrasound during pregnancy: an update for Canadian obstetrical caregivers. Journal of Obstetrics and Gynaecology Canada. 2006 Mar 1;28(3):203-5.
[10] Liu L, Oza S, Hogan D, Chu Y, Perin J, Zhu J, et al. Global, regional, and national causes of under-5 mortality in 2000–15: an updated systematic analysis with implications for the Sustainable Development Goals. The Lancet. 2016 Dec 17;388(10063):3027-35.
[11] Saigal S, Doyle LW. An overview of mortality and sequelae of preterm birth from infancy to adulthood. The Lancet. 2008 Jan 19;371(9608):261-9.
[12] Howson CP, Kinney MV, McDougall L, Lawn JE. Born too soon: preterm birth matters. Reproductive health. 2013 Nov;10(1):S1.
[13] Simcox R, Shennan A. Cervical cerclage in the prevention of preterm birth. Best Practice & Research Clinical Obstetrics & Gynaecology. 2009 Oct 1;23(5):831-42.
[14] Karau PB, Mutwiri MG, Ogeng'o JA, Karau GM. Use of cervical cerclage as a treatment option for cervical incompetence: patient characteristics, presentation and management over a 9 year period in a Kenyan centre. African journal of reproductive health. 2013;17(1):169-73.
[15] Berghella, Vincenzo. "Cerclage use should be more evidence-based." (2015): 240-242.
[16] Gonik B. High Risk Pregnancy-Management Options (expert Consult-Online and Print. Elsevier Health Sciences; 2010.
[17] Romero R, Espinoza J, Kusanovic JP, Gotsch F, Hassan S, Erez O, et al. The preterm parturition syndrome. BJOG: An International Journal of Obstetrics & Gynaecology. 2006 Dec 1;113:17-42.
[18] Rees S, Harding R, Walker D. The biological basis of injury and neuroprotection in the fetal and neonatal brain. International Journal of Developmental Neuroscience. 2011 Oct 1;29(6):551-63.

[19] Owen J. Cervical insufficiency. Queenan’s Manag High-Risk Pregnancy Evidence-Based Approach. 2012 Feb 24;85(48):271-9.

[20] American College of Obstetricians and Gynecologists. ACOG practice bulletin No. 142: cerclage for the management of cervical insufficiency. Obstetrics and gynecology. 2014 Feb;123(2 Pt 1):372.

[21] Kayambo D. Review of the contemporary use of transvaginal cervical cerclage for the prevention of preterm birth at Tygerberg Hospital (Doctoral dissertation, Stellenbosch: Stellenbosch University).

[22] Becher N, Waldorf KA, Hein M, Uldbjerg N. The cervical mucus plug: structured review of the literature. Acta obstetricia et gynecologica Scandinavica. 2009 Jan 1;88(5):502-13.

[23] Mancuso MS, Owen J. Prevention of preterm birth based on a short cervix: cerclage. InSeminars in perinatology 2009 Oct 1 (Vol. 33, No. 5, pp. 325-333).

[24] O'Hara S, Zelesco M, Sun Z. Cervical length for predicting preterm birth and a comparison of ultrasonic measurement techniques. Australasian journal of ultrasound in medicine. 2013 Aug;16(3):124-34.

[25] Suhag A, Berghella V. Cervical cerclage. Clinical obstetrics and gynecology. 2014 Sep 1;57(3):557-67.

[26] Rust OA, Atlas RO, Reed J, van Gaalen J, Balducci J. Revisiting the short cervix detected by transvaginal ultrasound in the second trimester: why cerclage therapy may not help. American journal of obstetrics and gynecology. 2001 Nov 1;185(5):1098-105.

[27] Lazar P, Gueguen S, Dreyfus J, Renaud R, Pontonnier G, Papiernik E. Multicentred controlled trial of cervical cerclage in women at moderate risk of preterm delivery. BJOG: An International Journal of Obstetrics & Gynaecology. 2004 Aug;91(8):731-5.

[28] Belej-Rak T, Okun N, Windrim R, Ross S, Hannah ME. Effectiveness of cervical cerclage for a sonographically shortened cervix: a systematic review and meta-analysis. American journal of obstetrics and gynecology. 2003 Dec 1;189(6):1679-87.

[29] Qu XL, Wang HT, Zou JL, Cheng L, Wang F, Ma LL, Li J. Effect of transvaginal ultrasound on human chorionic villus cell apoptosis during pregnancy. Genet Mol Res. 2015 Dec 29;14(4):18771-7.

[30] Owen J, Yost N, Berghella V, Thom E, Swain M, Dildy III GA, Miodovnik M, Langer O, Sibai B, McNellis D. Mid-trimester endovaginalsonography in women at high risk for spontaneous preterm birth. Jama. 2001 Sep 19;286(11):1340-9.

[31] To MS, Alfievic Z, Heath VC, Cicero AM, Williamson PR, et al, Fetal Medicine Foundation Second Trimester Screening Group. Cervical cerclage for prevention of preterm delivery in woman with short cervix: randomised controlled trial. The Lancet. 2004 Jun 5;363(9424):1849-53.

[32] Berghella V, Bega G, Tolosa JE, Berghella M. Ultrasound assessment of the cervix. Clinical obstetrics and gynecology. 2003 Dec 1;46(4):947-62.

[33] Berghella V, Rafael TJ, Szychowski JM, Rust OA, Owen J. Cerclage for short cervix on ultrasonography in women with singleton gestations and previous preterm birth: a meta-analysis. Obstetrics & Gynecology. 2011 Mar 1;117(3):663-71.

[34] Berghella V, Odibo AO, To MS, Rust OA, Althuisius SM. Cerclage for short cervix on ultrasonography: meta-analysis of trials using individual patient-level data. Obstetrics & Gynecology. 2005 Jul 1;106(1):181-9.

[35] Lee SM, Jun JK. Prediction and prevention of preterm birth after cervical conization. Journal of gynecologic oncology. 2010 Dec 30;21(4):207-8.

[36] Mukherjee GG, editor. Critical Issues in Obstetrics and Gynecology-ECAB-E-Book. Elsevier Health Sciences; 2014 Dec 11.
[37] Ehsanipoor RM, Seligman NS, Saccone G, Szymanski LM, Wissinger C, Werner EF, Berghella V. Physical examination–indicated cerclage: a systematic review and meta-analysis. Obstetrics & Gynecology. 2015 Jul 1;126(1):125-35.

[38] Zaveri V, Aghajafari F, Amankwah K, Hannah M. Abdominal versus vaginal cerclage after a failed transvaginal cerclage: a systematic review. American Journal of Obstetrics and Gynecology. 2002 Oct 1;187(4):868-72.

[39] Rafael TJ, Berghella V, Alfirevic Z. Cervical stitch (cerclage) for preventing preterm birth in multiple pregnancy. Cochrane database of systematic reviews. 2014(9).

[40] Saccone G, Rust O, Althuisius S, Roman A, Berghella V. Cerclage for short cervix in twin pregnancies: systematic review and meta-analysis of randomized trials using individual patient-level data. Acta Obstetricia et Gynecologica Scandinavica. 2015 Apr; 94(4):352-8.

[41] Giraldo-Isaza MA, Berghella V. Cervical cerclage and preterm PROM. Clinical Obstetrics and Gynecology. 2011 Jun 1;54(2):313-20.

[42] Rodriguez PA, Fylstra D, Newman R, Nino JM. Shirodkar Cerclage is More Effective than McDonald for the Prevention of Preterm Birth [36n]. Obstetrics & Gynecology. 2018 May 1;131(5):S2-S3.

[43] Drakeley AJ, Roberts D, Alfirevic Z. Cervical stitch (cerclage) for preventing pregnancy loss in women. Cochrane Database of Systematic Reviews. 2003(1).

[44] ER P, NA IJ. Cervical cerclage complications: eight years of experience. Perinatal Journal. 2014;22(2):99-104.

[45] Lotgering FK, Gaugler-Senden IP, Lotgering SF, Wallenburg HC. Outcome after transabdominal cervicoisthmic cerclage. Obstetrics & Gynecology. 2006 Apr 1;107(4):779-84.

[46] Shennan A, Jones B. The cervix and prematurity: aetiology, prediction and prevention. In Seminars in Fetal and Neonatal Medicine 2004 Dec 1 (Vol. 9, No. 6, pp. 471-479).

[47] Khan Z, Khan R, Aitazaz F. Success rate of cervical cerclage in preventing preterm labour. Pakistan Journal of Physiology. 2016;12(3):33-6.

[48] Liu Y, Ke Z, Liao W, Chen H, Wei S, Lai X, et al. Pregnancy outcomes and superiorities of prophylactic cervical cerclage and therapeutic cervical cerclage in cervical insufficiency pregnant women. Arch Gynecol Obstet 2018; 297(6):1503-1508.

[49] Prasad N, Thampan A S, Nagarathnamma R. Emergency cervical cerclage and pregnancy outcomes. Int J Reprod Contracept Obstet Gynecol 2017; 6:1993-1998.

[50] Lakshmi VGN, Saradha. Pregnancy outcome after cervical encerclage. Indian Journal of Obstetrics and Gynecology Research 2017; 4(3):301-305.

[51] AbidAl_kareem IH. Prophylactic cervical suture in triplet pregnancy. Tikrit Medical Journal 2010; 16(2):39-47.

[52] Liu Y, Ke Z, Liao W, Chen H, Wei S, Lai X, et al. Pregnancy outcomes and superiorities of prophylactic cervical cerclage and therapeutic cervical cerclage in cervical insufficiency pregnant women. Arch Gynecol Obstet 2018; 297(6):1503-1508.
[57] Lee K-N, Whang E-J, Chang KH-J, Song J-E, Son G-H, Lee K-Y. History-indicated cerclage: the association between previous preterm history and cerclage outcome. Obstetrics & Gynecology Science 2018; 61(1):23-29.

[58] Liddiard A, Bhattacharya S, Crichton L. Elective and emergency cervical cerclage and immediate pregnancy outcomes: a retrospective observational study. JRSM Short Reports 2011; 2(11):91.

[59] Simcox R, Shennan A. Cervical cerclage: a review. Int J Surg 2007; 5(3):205-209.

[60] Sharma N, Ram K, Sharma A. A unique case report having twice cervical cerclage in same pregnancy with successful fetal outcome in a bad obstetric history patient. Int J Reprod Contracept Obstet Gynecol 2013; 2:728-9.

[61] Chan LL, Leung TW, Lo TK, Lau WL, Leung WC. Indications for and pregnancy outcomes of cervical cerclage: 11-year comparison of patients undergoing history-indicated, ultrasound-indicated, or rescue cerclage. Hong Kong Med J 2015; 21(4):310-317.

[62] Lu C, Lim B, Robson SJ. Increasing Incidence Rate of Cervical Cerclage in Pregnancy in Australia: A Population-Based Study. Parthasarathy S, ed. Healthcare 2016; 4(3):68.63.

[63] Gupyto M Emary K, Impy L Emergency cervical cerclages predictors of success. J matern fetal Neonatal med 2010; 23: 670-4.