THE PREVALENCE OF CERVICAL INCOMPETENCY IN PRETERM BIRTH AND RECURRENT ABORTION

Wahida Ahmady
Department of Obs/gyn, Medical Faculty, Nangarhar University, Jalalabad city, Afghanistan

Noorina Kamawal
Department of Obs/gyn, Public health hospital, Jalalabad city, Nangarhar, Afghanistan

Fahima Shirzad
Department of Obs/gyn, Public health hospital, Jalalabad city, Nangarhar, Afghanistan
Corresponding author Email: wahida.ahmady1@gmail.com

ABSTRACT

During normal pregnancy the neck of the uterus (cervix) stays tightly closed, allowing the pregnancy to reach full term. The inability of the uterine cervix to retain a pregnancy in the second trimester is referred to as cervical insufficiency. Cervical insufficiency is an important cause of preterm birth and recurrent pregnancy loss and is estimated to complicate up to 1% of pregnancies. The objective of this study is to find the prevalence of cervical incompetency in preterm birth and recurrent abortion.

A hospital based retrospective cross sectional study was conducted during six months (01/01/1401 to 30/6/1401), on 6802 women who were admitted due to obstetric conditions, 220 (3.23%) women were suffered from cervical incompetency. The women aged 18 -45 years. Women were diagnosed cervical incompetency and admitted in Nangarhar university teaching hospital (gestational age 14-36 weeks) were included in the study. Women were excluded if membranes were prolapsed below the external os, abruption or unexplained vaginal bleeding, uterine activity and cervical change associated with preterm labour. A pre-tested structured questionnaire was adapted for collecting of data.

In 6802 women who admitted due to obstetric conditions, 220 (3.23%) from cervical incompetency. The most affected (53.1%) age group interval was (30 to 40-year age group). about two third (77.27%), fourth-five (80.80%). It one -half (55.45%) of participants were, illiterate and house wives, lived in rural areas and expressed as the economic

condition as poor, respectively. The percentage of cervical incompetency in primiparous women were 63(28.63%) and in multiparous women were 157(71.36%), 122(55.45%) women suffered from preterm birth and 98(44.54%) suffered from recurrent pregnancy loss. The most common causes of pregnancy loss were previous history of RPL (46.36%) the other causes were cervical

Trauma (14.09%), congenital and acquired anomaly of uterus (10.90%), uterine fibroma (5.45%), but in some cases the causes are still remain unknown.

Keywords: Cervical Incompetence, Cervical, Recurrent Pregnancy Loss (RPL), Preterm birth.

INTRODUCTION

The abortion rate has declined in recent years to the lowest rate ever in the US (14.6 abortions per 1000 women ages 15–44); the decline is related to the decrease in unintended pregnancies due to increased use of highly effective contraception [2]. In 2014, 19% of all pregnancies, were managed with abortion, resulting in approximately 926 200 US abortions that year.

Back in 1976, the World Health Organization (WHO) defined the RPL as three and more consecutive abortions before the 22nd week of gestation or the loss of a fetus weighing <500gr. Nearly 10–15% of clinical pregnancies and 30% of all pregnancies terminate with spontaneous abortion, making it the most frequent pregnancy complication [6]. Most of the sporadic pregnancy losses before 10 weeks of gestation result from chromosome aberrations (monosomy, trisomy, and polyploidy) [1,6]. The variance and discrepancy in definitions of RPL lead to difficulty in the real prevalence estimation [4,8]. Moreover, cultural and traditional relationships may prevent women from having open discussions about their abortions due to the possible blame from the society they lives in [12].

Furthermore, RPL incidence may be underreported since not many countries must document pregnancy losses as a separate indicator in national healthcare databases [13]. All these factors contribute to the underestimation of RPL prevalence in some world regions [12].

Women's age at conception is reported to serve as an independent risk factor for miscarriage [11]. The risk of miscarriage is slightly elevated among young mothers and then increases abruptly in advanced-age mothers [7]. According to the RCOG guideline data, the age-related risk of pregnancy loss is 13% in ≤19 years; 11–12% in 20–29 years; 15% in 30–34 years; 25% in 35–39 years; 51% in 40–44 years; and 93% in ≥45 year's age groups [12].The increased risk of miscarriage for women >35 years old appears even more dramatic, considering that the chances to conceive in this age

group decline with years [2]. Spontaneous pregnancy loss is a common medical condition in reproductive-age women. According to a worldwide estimation, 23 million cases occur annually [7].

Recurrent pregnancy loss is a complex health challenge with no universally accepted definition. Inconsistency in definitions involves not only the number of spontaneous abortions (two or three) that are accepted for recurrent pregnancy loss but also the types of pregnancy and gestational age at miscarriage[8].The exact etiology of recurrent pregnancy loss remains questionable; thus, it is considered a poly etiological and multifactorial condition with many modifiable and non-modifiable factors involved. Even after thoroughly evaluating recurrent pregnancy loss etiology and risk factors, up to 75% of cases remain unexplained. Due to the heterogencity of definitions and criteria applied by international guidelines for recurrent pregnancy loss, the true incidence of recurrent miscarriage, which is reported to range from 1% to 5%, is difficult to estimate [9].

The prevalence of anatomical uterine anomalies in women experiencing RPL varies from 15% to 42% according to different studies [8].Congenital uterine anomalies are associated with 7%– 28% of RPL [10].These mainly include septate uteri and more rarely arcuate or bicorporeal uteri. Acquired uterine anomalies are associated with 6%–15% of RPL [4].These include submucosal myomas, intrauterine adhesions (IUAs), and endometrial polyps [2].

Congenital uterine anomalies are the other causes of recurrent abortion and preterm birth. The septate uterus is the congenital malformation most commonly associated with RPL, being found in 6%–16% of cases [4]. Septate uteri (class U2) result from partial or complete failure of resorption of the medial septum between the two Mullerian ducts during fetal life [2].

The prevalence of fibroids in RPL varies from 0.5% to 1.3%, depending on the study. Fibroids are also associated with infertility due to implantation failure [7].

Cerclage is indicated in patients with a history of cervical deficiency as guided by history, physical examination, or ultrasound findings. A history of cervical insufficiency is suggested by one or more second-trimester losses related to painless cervical dilation in the absence of labor or placental abruption. The findings considered to be concerning for cervical insufficiency include examination-evidence of painless cervical dilation in the second trimester or ultrasound evidence of a cervical length of <25 mm in a patient with a history of preterm birth before 34 weeks of gestation [3].

A cerclage, or purse-string suture around the cervix, can be used to treat cervical insufficiency and prevent second-trimester

loss and preterm birth. Traditionally, a cerclage is placed vaginally; however, a cerclage may instead be placed abdominally in more severe cases where a vaginal cerclage has failed or the cervix is extremely short [4].

Vaginal cerclage was first described a half a century ago as a preventive measure for patients with an extremely short cervix due to müllerian anomalies or cervical surgery. Two notable techniques were described by Shirodkar and McDonald in the 1950s [8].

Most studies measure the success of a cerclage by the neonatal survival rate, defined as the percentage of pregnancies with neonates surviving until hospital discharge. According to the literature, neonatal survival rates after a laparoscopic or open abdominal cerclage range from 71% to 100 % [7].

There are a number of proposed surgical methods designed to keep the cervix closed until the expected time of birth. All interventions require at least regional anaesthesia in the form of a spinal or epidural block. Cunningaham reported the insertion of a cervical stitch (suture) at around 14 weeks of pregnancy. The anterior vaginal wall is cut and the bladder reflected (pushed) back and upwards allowing an access close to the level of the internal cervical os by the vaginal route. A stitch, usually silk, tape, or other non-absorbable material, is inserted around the cervix, enclosing it. It described a simpler purse string stitch technique, whereby the stitch is inserted around the body of the cervix visible in the vagina in three or four bites. Although the internal os is often not reached, the procedure is easier to perform with less bleeding. These techniques were described as elective (planned) procedures [5].

This study aimed to evaluate the prevalence of cervical incompetency in our population. In addition, our study showed that the most common causes of cervical incompetency were cervical trauma, previous history of recurrent pregnancy loss, uterine anomalies and uterine fibroma. Studies on etiology and risk factors for recurrent pregnancy loss, especially idiopathic, should be continued.

MATERIALS AND METHODS

A hospital based retrospective cross sectional study was conducted during six months (01/01/1401 to 30/6/1401), on 6802 women who were admitted due to obstetric conditions, 220 (3.23%) were suffering from cervical incompetency. The women aged 18 -45 years. Women with cervical incompetency and admitted in Nangarhar university teaching hospital (gestational age 14-36 weeks) were included in the study. Women whose membranes were prolapsed below the

external os, who had abruption or unexplained vaginal bleeding,

uterine contraction and cervical change associated with preterm labour were excluded.

Data collection:

The data were collected from (01/01/1401 to 30/6/1401). The trainees of specialization program and senior doctor staff were hired for gathering the data. For a reliable collection of the data the training of the staff and editing of the questionnaire were preformed.

Study variables:

Variables of the study included socio-demographic characteristics, the morbidities of obstetrics and gynecology. The collected data for demographic variables included, age, educational status, weight, height, economical status, residency& job. The body mass index was calculating by measuring the height and weight. Detailed information was also collected about of the age of the fetus, history of previous recurrent pregnancy loss and preterm birth, uterine anomalies and uterine fibromas.

Data analysis:

The data were inserted to the IBM SPSS version 26 for analysis. For all continued variables we used the univariate analysis and descriptive statistics including frequency and percentage. Instead of names of the participants by using codes and numbers the confidentiality of the study was ensured.

Terms and definitions:

Preterm birth: defined as delivery before 37 completed weeks [8].

Perinatal loss: all losses including abortions, stillbirth and neonatal deaths [5].

Anemia: Anemia in pregnancy is present when the hemoglobin concentration in the peripheral blood is 11g/100ml or less [4].

Recurrent abortions: classically defined as three or more consecutive pregnancy losses at ≤ 20 weeks or with a fetal weight < 500 grams [4].

Cervical cerclage: A cerclage is a purse-string suture around the cervix for prevention of RPL[7].

RESULTS

This study involved 220 recurrent abortion and preterm birth cases delivered or aborted from (01/01/1401 to 30/6/1401)at Nangarhar University Teaching hospital in Jalalabad, Nangarhar Afghanistan.

Several factors have been suggested to contribute to RPL pathogenesis, including maternal age, uterine morphological pathologies (10–15%), parity (71%) and many other factors that

will be discussed later.

Table 1: prevalence of cervical incompetency

Admitted Patients	Number	Percentage
Total	6802	100
Cervical incompetent	220	3.23

The total pt admitted in the hospital were 6802 and the prevalence of cervical incompetency was 220; it shows that only 3.23% suffered from cervical incompetency.

Table 2: Socio-Demographic characteristics

Demographic variables		Number N =220	Percentage 100%
Age	Less than 20 year	8	3.63
	20 to 29 year	95	43.18
	30 and more than 30 years	117	53.1
Body weight	BMI normal (18.5-24.9)	123	55.90
	Over weight and obese	97	44.09
Educational status	Illiterate	170	77.27
	Literate	50	22.72
Residence	Rural	122	55.45
	Urban	98	44.54
Economic status	Poor	110	50
	Average	97	44.09
	Good	13	5.90
Occupation	No (house wife)	177	80.80
	Yes	43	19.54
Parity	Primi parous	63	28.63
	Multi parous	157	71.36

The age of mothers was 18–45 years. About 8 (3.63%) women were under 20 years, 95 (43.18%) were 20 to 29 year and 117 (53.1%) were 30 and more than 30 years.

Mean BMI 24.58 ± 2.66, about (44.09%) of them were obese.

Fourth-five 170 (77.27%) of the participants were illiterate (not educated) and (80.80%) were house wives, while 20 (22.72%) were literate. Two third (55.45%) lived in rural areas and one-third (44.54%) of them

lived in urban areas.

Only 5.90% of the participants expressed their economic status good, however half of them expressed poor.

Majority of the study participants, didn't have job, only 19.54% had skilled and unskilled occupations.

About one-fourth of the study participants were primiparous mothers 63(28.63%) and three- fourth (71.36%) were multi parous.

Table 3: Abortion and preterm birth due to cervical incompetency

Patient with cervical incompetency	Number	Percentage
Recurrent abortion	98	44.54%
Preterm birth	122	55.45%

Table 3 shows that the total prevalence of recurrent abortion was 98(44.54%) and the prevalence of preterm birth was 122(55.45%) in all admitted patients due to cervical incompetency.

Table 4: distribution of Miscellanies Causes of Cervical incompetency.

Causes	Frequency	Percentage
Anatomical uterine anomaly	24	10.90
Uterine fibroma	12	5.45
Previous history of RPL	102	46.36
Cervical trauma	31	14.09
unknown	51	23.18

Table 4 shows that cervical trauma was 31 (14.09%) and the anatomical uterine anomaly was seen in 10.90%. 5.45% of participating women had uterine fibroma, 46.36% women had previous history of RPL and in 51 women the causes of RPL remained unknown.

DISCUSSION

Preterm birth is the most common reason of a newborn baby death. It is the leading cause of death in children under five years of age. In 2019, five million children under five years of age died. almost half of these deaths occurre in the first month of life. Preterm birth is the most important contributing factor for high newborn death rates. Preterm birth (previously called premature birth) is defined as birth before 37 completed weeks of pregnancy. In addition the recurrent abortion is also one of the most common causes of perinatal death. One of the important causes of both preterm birth

and recurrent abortion is cervical incompetency and it is about 1-5%. In our study, the prevalence is 3.23% and it is about the same as other guidelines present, but it is more than China (1.4%). the reason maybe lack of the education of self-care and the role of delivering at hospitals and maternity centers and not attending prenatal clinics for checkups. The contribution of uterine structural anomalies to the etiology of RPL was reported in several studies and found to be present in about 10.90% of women with RPL compared with 4–7% of women in the general population [2].

Women's age at conception is reported to serve as an independent risk factor for miscarriage. The risk of miscarriage is slightly elevated in young mothers and then increases abruptly in advanced-age mothers [3]. According to the RCOG guideline data, the age-related risk of pregnancy loss is 13% in ≤19 years; 11–12% in 20–29 years; 15% in 30–34 years; 25% in 35–39 years; 51% in 40–44 years; and 93% in ≥45 years age groups [3,11].The increased risk of miscarriage for women >35 years old appears even more dramatic, considering that the chances to conceive in this age group decline with years. Comparing to our study, the risk of age-related recurrent pregnancy loss in women age 30 or more than 30 was about 53.1% and the recurrence chances was 46.36%.It is more than other guidelines. The reason might be lack of health facilities in Afghanistan and the poor economical state is the other reason [5].

Pertaining to socio demographic factors, in our study education level was found to be an important factor as there were (80%) illiterate women, which is beyond in compare to America (39% some high school or less) and it shows that the education level of Afghanistan is lower than other countries [7]. The other reason maybe lack of the education of self-care and the role of delivering at hospitals and maternity centers and not attending prenatal clinics for checkups. If we compare the age, in our study, most frequent age group was between 30 and more than 30 years comparing to Ethiopia where the maternal age was 35 or above. In our study, about more than half (55.45%) participants was lived in rural areas compare to Tanzania, the rural percentage was (73.3%) which shows that the health facilities in under developed countries are not accessible and available in rural areas of Tanzania [5].

The second common cause is the cervical trauma, in our study, the cervical trauma was also the second cause of cervical incompetency and it was about (14.09%) and in compare to Liverpool, UK it is higher (6.83%) [10]. Maybe the cause in our study is the participants as they are not using the health facilities most of the deliveries are at home, the trauma occurs and doesn't repair on time.

Our study showed that uterine anomalies were associated with cervical incompetency and this was reported by other studies as well. Anomaly of the uterus initiates by mullerian duct dysgenesis and it ends with cervical incompetency. Uterine fibroma in compare to Israel (5.45%) it was lower in our study, maybe the health facilities are not accessible to all pregnant women and also the education level is lower and is due to financial problems and low education and not attending antenatal care centers for checking and maybe misdiagnosed of uterine anomalies and fibromas [1].

In addition our study showed that history of RPL was found to be an associated factor for cervical incompetency, comparing to a study in Israel, it is the same [12].

As the study indicates, primiparity (28.63%) was found to have significant association with cervical incompetency. The same studies were found in Ethiopia, [13] in their studies multiparity were high risk for cervical incompetency.

Beneficiaries of our study are the health providers and the mothers. It provides the opportunity for the health policy makers to expand better policy for maternal health.

The limitations are as follows: it is an institutional (hospital based) retrospective cross-sectional study. In this study, only critical patients who visited/referred to the tertiary level hospital are included, therefore we couldn't generalize it's result to the community. The overall prevalence of cervical incompetency is also not determined. Due to inaccuracy or inappropriate recording in delivery register book, it is impossible to estimate accurate associated factors from secondary data.

CONCLUSION

Recurrent pregnancy loss is a complex health challenge with no universally accepted definition. Inconsistency in definitions involves not only the number of spontaneous abortions (two or three) that are accepted for recurrent pregnancy loss but also the types of pregnancy and gestational age at miscarriage. Preterm birth is the most common reason of a newborn baby death, and is the leading causes of death in children under five years of age, five million children under five years of age died. In addition the recurrent abortion is also one of the most common causes of perinatal death. One of the important causes of both preterm birth and recurrent abortion is of cervical incompetency which is about 1-5% cause of RPL. The most common cause is cervical incompetency, which is due to many other causes. This study aimed to evaluate the prevalence of cervical incompetency in our population. In addition, our study showed

that the most common causes of cervical incompetency were cervical trauma, previous history of recurrent pregnancy loss, uterine anomalies and uterine fibroma. Studies on etiology and risk factors for recurrent pregnancy loss, especially idiopathic, should be continued. The history of preterm labor, recurrent pregnancy loss, cervical incompetency, can be picked up at initial stage and recognize at risk mothers and can be prevented. In antenatal visits should be increased and the health facilitator advise them to deliver under the supervision of trained health workers.

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