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RESEARCH ARTICLE

THE EFFECTIVNESS OF EMERGENCY CERVICAL CERCLAGE AND VAGINAL PROGESTERONE IN MANAGEMENT OF SECOND TRIMESTER MISCARRIAGE

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Abstract

Cervical incompetence is an important contributor to pre-term birth and second trimester pregnancy loss. It is defined as the inability to support a full-term pregnancy because of a functional or structural defect of the cervix [1]. The typical symptoms of cervical incompetence include history of recurrent mid-trimester losses or pre-term birth and painless cervical dilatation in the absence of contractions or intrauterine infections. Labor is often short and the premature fetus is born alive. It is reported that the rate of cervical incompetence is between 0.1% and 2%, and is estimated to account for 15% of the recurrent pregnancy losses between 16 and 28 weeks [2]. ,In cases with cervical incompetence, mechanical support of a weak cervix is thought to be the main factor required to prolong the pregnancy. Cervical cerclage has been used to treat cervical incompetence for more than 50 years, since it was first described by Shirodkar [3] and later modified by McDonald [4]. Emergency cervical cerclage has been used as a salvage procedure in women with cervical dilatation and bulging fetal membranes in mid-trimester, in an attempt to prolong the pregnancy to a viable gestation. However, emergency cervical cerclage is likely to increase the risk of infection, due to increased exposure of the fetal membranes to vaginal commensals.Emergency cervical cerclage is effective in prolonging pregnancy and improving neonatal outcome in women with cervical incompetence. It should be considered a viable option for women with a dilated cervix in mid-trimester.

Introduction:-

The effectiveness of emergency cerclage: Some obstetricians believe that once cervical dilatation has occurred, infections, uterine contractions, or rupture of the membranes often follow, leading to a poor outcome after emergency cerclage [15,16]. In some developed countries, it is not recommended to perform emergent cervical cerclage beyond the limit of fetal viability (≥24 weeks), because the potential for harm probably outweighs the potential benefit [1]. Although the treatment of neonates in China had improved dramatically over the past few years [17], infants born before 28 weeks of gestation only have a survival rate of <50%, and more than half of the

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surviving infants are moderately to severely handicapped [18–20]. In the urgent situation of bulging membranes, emergency cervical cerclage may be the only hope for prolonging gestation until fetal viability is reached.

The safety of emergency cerclage:
Exposure of the fetal membranes to vaginal bacteria may increase the risk of chorioamnionitis, intraamniotic infection, hematosepsis of mother, or even maternal death because of severe infection

Prophylactic broad-spectrum antibiotics has to be given before, during, and after the cerclage and regularly monitoring inflammatory markers may reduce the incidence of infection.

Bulging membranes into the cervix, avoiding inadequate placement of the cerclage in a superficial portion of the cervix, and the risk of iatrogenic rupture of the membranes during the operative procedure make emergency cerclage difficult for surgeons and poses challenges such as uterine contraction, laceration of the cervix, or even hysterorrhexis after cerclage

However, aggressive tocolysis may lead to another problem. Atosiban, an oxytocin antagonist, has been shown to inhibit preterm uterine contractions effectively in placebo-controlled clinical trials without causing any significant cardiovascular, pulmonary, or central nervous system adverse effects

Deep venous thrombosis (DVT), a blood clot forming in a deep vein, is another maternal complication after emergency cerclage. The factors that increase risk for DVT on cerclage patients are hypercoagulable state of pregnancy and prolonged bed rest.

Discussion:-

Several factors are closely related to pregnancy outcomes. Namouz and Gupta [31,32] reported that predictors of poor outcome were prolapsed membranes, evidence of intra-amniotic or systemic infection, symptomatic presentation, and cervical dilatation greater than 3 cm.

Fortner et al. [33] reported that women who receive an emergency cerclage are more likely to deliver at an earlier gestational age when the cervical dilation is ≥2 cm at the time of procedure. This may be due to the increased exposure of fetal membranes to vaginal bacteria and because women with bulging membranes are more susceptible to infection. Moreover, the procedure is associated with more challenges as the degree of cervical dilation becomes greater. It is reported that women with cervical dilation of ≥2 cm at cerclage placement were more likely to have an intracervical Foley balloon catheter utilized for membrane reduction during the procedure

It has been reported that in women with emergency cerclage, delivery <32 weeks was significantly more common in women with symptoms (vaginal bleeding, discharge, or pelvic pressure sensation) [34

Vaginal Progesterone:
Pharmacology, mode of action, pharmacokinetics:
Progesterone is a naturally occurring steroid hormone produced by the adrenals, gonads, nervous system, and placenta in pregnancy. It is a derivative of cholesterol. Cholesterol is converted into pregnenolone by enzyme cytochrome P450, and pregnenolone is converted to progesterone by 3β-hydroxy-steroid dehydrogenase/Δ5, Δ4 isomerase in the smooth endoplasmic reticulum.32 Progesterone exerts its modulatory effects on target organs via intracellular receptor isoforms A (94 kDa) and B (116 kDa).36 The receptors are expressed by a single gene on chromosome 11q22–q23 but have separate translational start sites and promoters. Progesterone actions via membrane-based nongenomic receptors have also been illustrated.37 In therapeutics, progesterone is available in its natural form or synthetic form. Even though both forms are used for similar purposes, they are not chemically identical and their effect on target organs may not be similar.35,36

The natural progesterone is chemically identical to the ovarian progesterone and synthesized from Mexican yams or soybean extracts or animal sources. Its micronization decreases particle size, increases surface area, and thus improves absorption. This results in exponential rise in bioavailability with decreased metabolic and vascular side effects.38 The vaginal route further adds advantages to this form by rapid absorption and avoiding the first-pass hepatic metabolism, resulting in sustained plasma concentrations, and high bioavailability especially locally in the most desired target organ, the uterus. This has been termed as the ‘first uterine pass effect’ as progestational effects

on the endometrium are seen despite low plasma levels suggesting direct transit of vaginal progesterone into the uterus.39,40 In addition to the above advantages, vaginal route possibly is the preferred mode of administration as the pain associated with oil-based intramuscular (IM) injections, bad taste associated with intranasal route, poor absorption and higher doses with oral route, conflicting evidence and variable effects with transdermal route, and inconvenience with the intravenous or rectal routes is avoided

Progesterone derives its name from 'progestational steroid hormone' due to its primary function of preparing and maintaining the uterine bed for conception.41 Its benefits in decreasing early pregnancy loss via providing luteal support, both in women with threatened abortion and those undergoing artificial reproduction cycles, has led to its widespread use in the first trimester.42,43 Its role in the 2nd and 3rd trimesters of pregnancy is less clear, but its effects on the uterus (myometrium and cervix) form a biological plausible reason for its role in prevention of sPTB. Progesterone inhibits production of stimulatory prostaglandins (PG) and expression of contraction-associated protein genes in the myometrium.41 Clinically, this correlates with its mild tocolytic effects and significantly decreased spontaneous uterine contractions in women receiving progesterone compared to control groups.44 However, this has not translated into a clinical success as a stand-alone tocolytic, but progesterone possibly could have adjunctive role in decreasing sPTB in women with threatened or established preterm labor.

Our Case Scenario:
37 years old pregnant lady P1+0,with history of extreme preterm at 27 weeks delivery in her first pregnancy 17 years ago, presented to emergency with pregnancy 19w+2d with sever labor pains and cx dilated with amniotic fluid sac at vagina, emergency ultrasound confirm breech presentation with dilated cervix 2.22 cm,plus huge size uterine fibroid at anterior uterine wall8.65x7.77cm with cystic degeneration, placenta was anterior wall above the dilated cervix.

Patient admitted and kept in trendelenberge position and iv hydration with analgesic for 24 hours, reassessmentdone, still dilated cervix but fetal parts regret to the lower uterine segment, high risk consent for cervical cerclage signed by Patient after detailed councelling about benefits, risks and failure rate of emergency cerclage.

Emergency cerclage done under spinal anasethia, patient kept under observation 24 hours, proluton depot 250 mg im stat given, duphaston 10 mg pot id,endometrin 100mg pv bd started.

Ultrasound repeated 24 hours after cerclage finding was: still baby breech 19w+4d,cervix closed by merseline tape, cervicallength was3.22cm,EFW was264 gm. Patient discharged home with same medications, asymptomatic.

Follow up after one week, patient has epigastric pain and intermittent abdominal pain, nausea and reflux due to excess progesterone, oral, im weekly and vaginal bd.

Ultrasound done: fetus was cephalic 21w+5d, cervix closed, 1.13 cm long, fibroid was 8.45x7.49 cm.

Plane was to continue only on vaginal progesterone 100 mg pv bd and good hydration, follow up every 2 weeks.

Patient was complaint on her ANC visits, after 2 weeks, asymptomatic, nopain, nonausea, no vaginal discharge, GBS done at 35 weeks, it was negative.

At 36w+3d, patient start leaking, emergency removal of cerclage, followed by spontaneous delivery of late preterm male baby weight 2.3kgm.

Baby kept indoor with mother, no NICU, start breast feeding within one hour of delivery, discharged home with mother.

The illusterated ultrasound photos document:
1. 1-At time of emergency admission,19w+2d GA,with dilated cervix and af sac at vagina with breech presentation.
2. 2-anterior uterine wall fibroid with cystic degeneration,8.65x7.77 cm
3. 3-At GA 19W+4D after cerclage,cervix closed.
4. 4-At GA 21W+5D,Cervix closed,fetus cephalic.

GA:19W+2D. CERVIX DILATED ,BREECH

ANTERIOR UTERINE WALL FIBROID WITH CYSTIC DEGENERATION

GA:19W+4D,CERVIX CLOSED BY EMERGENCY CERCLAGE

GA:21W+5D,CX CLOSED,CEPHALIC

Conclusion:-

Emergency cerclage is effective method to prevent second trimester abortion and preterm labor.

Vaginal progesterone improves the outcome of emergency cervical cerclage at second trimester abortion, even with presence of other risk factors like degenerated big uterine fibroid.

GIT symptoms, vaginal discharge was not associated with use of vaginal progesterone 100 mg pv bd.

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