Comparison of the operative and post operative outcome between episiorrhaphy with and without application of policresulen solution*

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ABSTRACT

Background: Episiotomy is a surgical incision of the perineum performed to widen the vaginal opening to facilitate the delivery of an infant. Bleeding is its common complication. A certain technique must be followed so as not to incur either dyspareunia, dehiscence or infection. Hence the application of policresulen solution during repair may minimize bleeding and facilitate better wound healing.

Objective: To compare the operative and post-operative outcome between episiorraphy with and without application of policresulen solution during repair among puerperal patients admitted in a tertiary hospital.

Methodology: One hundred participants were randomized to two treatment groups. Those assigned to treatment A (n=50) underwent episiorrhaphy with policresulen solution application while those in treatment B (n=50) served as the control group. The main outcome measures were estimated blood loss, operative time and duration of wound healing.

Results: There was a significantly shorter mean operative time with the participants in the Policresulen group (20.92 ± 0.90 minutes) as compared to the Control group (53.8 ± 1.79 minutes) with a P-value of < 0.001. Estimated mean blood loss was significantly lesser in the Policresulen group (195.2 ± 5.69 ml) than in the Control group (373.8 ± 16.14 ml) having a P-value of < 0.001. The duration of wound healing was also shorter among those in the Policresulen group (1.42 ± 0.09 weeks) than those in the Control group (2.14 ± 0.17 weeks), with a P-value of 0.003. A significantly greater proportion of participants had shorter operative time, lesser blood loss and shorter duration of wound healing in the policresulen group. (p-value < 0.005)

Conclusion: Policresulen solution application has a good hemostatic effect on the episiotomy wound hence shortened the operative time. It also has a good wound healing effect reflected by a shortened duration of wound healing of the episiotomy wound.

Keywords: Policresulen solution, episiotomy, blood loss, operative time, wound healing

INTRODUCTION

Episiotomy is a surgical incision of the perineum performed to widen the vaginal opening to facilitate the delivery of an infant. It was first recommended as a way of facilitating completion of the second stage of labor and reducing the maternal and neonatal trauma and morbidity associated with delivery. Midline episiotomy is recommended over mediolateral episiotomy because it is easy to repair with good healing process and minimal postoperative pain. Midline episiotomy and repair was also associated with excellent anatomical results as well as less blood loss and dyspareunia. However, this type of episiotomy is prone to develop rectal extension. On the other hand, with the muscle involvement during mediolateral episiotomy, more blood loss may be expected.[1]

Bleeding is one of the most common complications of episiotomy. The perineum and surrounding tissues have an extensive vasculature, and the blood supply to these areas is increased by the physiologic changes of pregnancy and labor.[2] Immediately after delivery, the episiotomy site should be inspected for bleeding. Because episiotomy is usually performed at the time of crowning, it is possible that the incision be made through blood vessels that have been rendered invisible by compression from the fetal head. Inspection should include an evaluation for arterial bleeding, which may require suture ligation.[3] Therefore it is very important in the repair of the episiotomy that a certain technique be followed so as not to incur excessive blood loss, hematoma, dyspareunia, dehiscence and infection.

STATEMENT OF THE PROBLEM

Will the application of policresulen solution on the episiotomy wound reduce the amount of blood loss, operative time and duration of wound healing?

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REVIEW OF RELATED LITERATURE

During vaginal delivery blood is lost because some blood vessels are opened when the placenta detaches from the uterus and with episiotomy or tear during birth.[3] Based on the study done by Odell et al on blood loss with episiotomy, the average amount of blood loss after vaginal birth of a single baby is about 500 ml. Approximately half of it 200 to 250 ml comes from the placenta and the rest of the blood lost 250 to 300 ml can be accounted from the uterus and the episiotomy wound. These were measured by direct method using Excellent BRASSS-V Drape.[5]

Typical episiotomy site bleeding can generally be controlled with conservative measures such as compression while the repair is being performed to achieve hemostasis.[4] With poor hemostasis, complication may arise and this includes hematoma formation at the episiotomy site. This can cause significant maternal morbidity particularly with deep hematomas which dissect proximally toward the upper vagina and the broad ligament.[4] Hence careful inspection prior to and during the repair is required.

In order to lessen morbidity during normal spontaneous delivery with episiotomy, proper technique of episiorrhaphy and appropriate hemostasis should be instituted. Episiorrhaphy is performed by continuous closure of the vaginal mucosa and submucosa, fascia and muscles as well as the skin. The suture usually used during the repair is chromic absorbable 2-0 or 3-0 or vicryl rapid suture for continuous closure of the vaginal mucosa and submucosa. After closing the vaginal incision and reapproximating the cut margins of the hymenal ring, the needle and suture are positioned to close the perineal incision. The continuous suture is then carried upward as a subcuticular stitch. The final knot, tied proximally to the hymenal ring. This was based on the recommended procedure of midline episiotomy wound repair by Williams Obstetrics.

A medicinal plant extract Ankaferd Blood Stopper is an agent known for its hemostatic action. This was evaluated by H Goker et al at the Department of Hematology, Hacettepe University Medical School Ankara, Turkey. This is a new hemostatic agent that is licensed for external hemorrhages. Ankafer Blood Stopper (ABS) is comprised of a standard mixture of plants such as Thymus vulgaris, Glycyrrhiza glabra, Vitis vinifera, Alpinia officinarum, and Urtica dioica which has been approved in Turkey for the management of bleeding. The effect of ABS on the status of the primary and secondary hemostatic system components like coagulation proteins, platelets and blood cells was evaluated in vitro using routine hemostatic laboratory tests. For the hematological test, ABS was diluted with pooled fresh normal human plasma in a range of dilutions from 0% to 50% in order to study its in vitro effects on several routine hematological parameters. These tests include individual coagulation factors (II, V, VII, VIII, IX, X, XI and XIII), prothrombin time (international normalized ratio) (PT [INR]), activated partial thromboplastin time (aPTT), fibrinogen, thrombin time (TT), D-dimer test, platelet aggregation test and other hemostatic parameters. All tests were carried out at 37ºC and the dilutions were left for no longer than 15 minutes before carrying out the tests. Each test was repeated twice and the mean was calculated. It was found out that ABS induced very rapid (< 1 s) formation of a protein network in the plasma and serum samples. For the biochemical test, Ankaferd Blood Stopper was diluted with pooled fresh normal human serum, and total protein, albumin and globulin levels were determined using routine biochemical methods. Biochemical tests showed that total protein, albumin and globulin levels decreased after the addition of ABS to fresh serum. Blood cells, particularly erythrocytes, were found to aggregate rapidly (< 1 s) in the presence of ABS, thereby participating in protein network formation. Hence, normal hemostatic elements were spared during formation of the protein network, the blood clotting process being driven by protein agglutination.[6]

In the year 2011 Evi, EG et al in Turkey evaluated the use of Ankafer Blood Stopper during the episiotomy repair. This study was conducted to evaluate the efficacy of ABS spray in terms of blood loss during episiotomy repair. Forty pregnant women at least 18-years-old, who delivered vaginally to a term singleton fetus (37 to 40 weeks) in vertex position and required a mediolateral episiotomy were included. The participants were randomly assigned to one of the two approaches: 20 (Group 1) to ABS and 20 (Group 2) to isotonic saline solution (0.9% NaCl). The investigators applied a sponge soaked with 4 ml of the ABS spray solution (1 ml/puff X 4) on the episiotomy site of the participants in group 1 and with 4ml of isotonic saline solution (0.9% NaCl) among those in group 2. The sponge was weighed before and after the episiotomy repair to determine the amount of bleeding. Hemoglobin values were also recorded on admission and 12 hours after delivery. According to their results the hemoglobin of the participants on the first postpartum day was significantly higher in the ABS group ($p < 0.05$). However, the operative time for episiotomy repair for the participants from the two groups was not found to be significantly different. No major immediate or delayed complications were observed in either group. Based on this study, there is a potential for ABS to reduce the incidence of anemia probably due to lesser blood loss during episiotomy repair.

Ankafer blood stopper is not available in the Philippines but its mechanism of action is almost similar to policresulen solution.[7] Policresulen solution contains

m-cresolsulfonic acid polymer with formaldehyde. It has a wide spectrum for bactericidal, fungicidal and trichomonicidal effect. It has a selective effect on dead or pathologically altered tissue, producing coagulation with subsequent elimination. Healthy squamous epithelium is not affected. Due to its broad antimicrobial spectrum, policresulen eradicates the pathogenic germs of the vagina (bacteria, trichomonas and fungi), but enhances the growth of the Lactobacilli (Doderlein's bacilli) responsible for maintaining the physiological acidity of the vagina. Policresulen solution quickly decreases subjective complaints like pruritus and discharge. It possesses potent astringent and hemostatic properties. Re-epithelization is favored by reactive hyperemia in the treated area and by stimulation of the granulation of normal tissues.

In a study made by Yu Jun Wang Wen Ying, policresulen was used and its efficacy was determined in the treatment of simple type of mild to severe cervical erosion. A total of 353 cases diagnosed with cervical erosion were included in the study. Policresulen solution was used to cleanse the cervix and vagina for 3 minutes every other day. The outcome of treatment was categorized as to cure, effective and invalid. It is said to be cured if the cervical erosion surface disappeared; effective if the erosion surface was reduced to 50% or papillary converted to particle type, particle-based to simple; and invalid if there is no change in erosion surface or development. For the results of the study, the total effective rate for mild cervical erosion was 92.4%, for moderate cervical erosion 85.1%, and for severe cervical erosion 72.0%. Hence, the authors concluded that policresulen has a significant curative effect on cervical erosion particularly for the simple mild to moderate type. Its potential use in the management of cervical erosion may be clinically valuable.[8]

Policresulen may also have favorable effect on wound healing since aside from selective coagulation, it also promotes tissue regeneration and epithelial recovery of devitalized tissues. However, this only occurs in normal tissue wherein after exposure to this drug, tissue shrinkage occurs for a few seconds. In cervical erosion, policresulen solution may have selective effect on burning the tissue and later causes necrosis, and shedding then promote re-epithelialization eventually healing.

A study done by Zedan et al evaluated the wound healing effect of Policresulen solution on the ulcerated buccal mucosa of guinea pigs. The study was performed on the cheek pouch mucosa of Guinea Pigs histologically and immunohistochemically. The study was carried out on 32 male Guinea Pigs. The animals were classified into three experimental groups with 10 animals each and one control group with two animals. The left buccal pouches of the experimental groups were painted with the Policresulen 360 mg solution twice daily, while in the control group; the left pouches were painted with normal saline. The period of application for the 1st experimental group was daily for 1 week, then 2 weeks for the second and 3 weeks for the last group. The animals from all groups were sacrificed and the required buccal pouches were surgically excised. The specimens were fixed, prepared for regular haematoxylin and eosin staining and epithelial cadherin immunohistochemical staining. The histologic findings in the experimental group revealed increased epithelial cellular activity reflected by the dysplastic changes. This was noted to increase from the 1st to the 3rd week of application of Policresulen. The changes observed were in the form of epithelial hyperplasia, lymphocytic infiltration in the connective tissue, hydrophic degeneration in basal and suprabasal layer, as well as hyperchromatism in the basal and suprabasal cell layers. Among the reported changes the thinning of keratin layer was found to be prominent with the presence of focal areas of necrosis in the subepithelial connective tissue. The immunohistochemical results for E-cadherin protein deposits revealed that the degree of immunostain intensity decreased with an increase in application time of Policresulen. This indicates that the cellular attachments were decreased with the reduction of E-cadherin expression level. Thus, the researchers concluded that with the topical application of Policresulen there was induction of dysplastic changes in normal oral mucosa of Guinea Pig which eventually promoted wound healing effect.[10] However, it was found out in this study that the longer the application of policresulen solution the higher the potential to cause toxic effects on the tissue such as formation of mitotic figures, hyperplasia, necrosis and loss of E-cadherin that will eventually lead to tissue loss or damage.

The episiotomy wound is expected to heal in about 2 to 3 weeks from repair. The duration of healing depends on the length and depth of incision, suture used during repair as well as the lifestyle of the mother after delivery.[11] With the properties and effect of policresulen, will it be able to shorten healing of the episiotomy wound?

With regards to the hemostatic effect of policresulen solution on episiotomy site as well as wound healing, a computerized MEDLINE database search was done from 1990 to 2015. Using the free text and medical subject headings (MESH) of the search terms episiotomy, episiorrhaphy, policresulen and wound healing. The union and intersection of these terms yielded 113 articles. However, no article was found to be relevant with what we are interested on. It is worthwhile to investigate if policresulen will be beneficial among women undergoing episiotomy. We are interested to establish if its healing effects on the cervix will be similarly beneficial to the vaginal mucosa, muscles and its fascial coverings.

SIGNIFICANCE OF THE STUDY

There are common complications during normal spontaneous delivery such as bleeding, hematoma formation that could cause anemia more so with episiotomy. Another possible complication is infection that could cause faulty wound healing and eventually wound dehiscence. This can occur especially if the technique of episiorrhaphy and hemostasis were not properly done. With this study, we aim to investigate on the potential benefits of the application of policresulen solution during episiorrhaphy in preventing the above mentioned complications. Our goal as obstetrician is to search for measures to ensure that each and every woman will have an uneventful and successful delivery as well as an unremarkable puerperal course.

OBJECTIVES

- GENERAL OBJECTIVE: To compare the operative and post-operative outcome between episiorraphy with and without application of policresulen solution during repair among puerperal patients admitted in a tertiary hospital.

- SPECIFIC OBJECTIVES:
  1) Compare the following between with and without Policresulen Solution application during episiotomy repair :
     a. Duration of Operative time
     b. Amount of blood loss
     c. Duration of wound healing
  2) Determine the incidence of adverse effects with policresulen application.

OPERATIONAL DEFINITION OF TERMS:

a. Independent Variable - refers to the treatment evaluated in this study and these were later encoded and entered as

0 - Episiorrhaphy without policresulen solution
1 - Episiorrhaphy with policresulen solution application

b. Dependent variables- refers to the following:

1 - Operative time- this variable was recorded as the actual time in minutes starting from actual episiotomy incision to closure of the skin. This was later categorized and encoded as

0 - <30 minutes
1 - >/= 30 minutes

2 - Amount of blood loss- this was recorded in milliliters based on the actual estimated amount of blood collected from a calibrated bag and the operative sponge soaked with blood during episiorrhapy excluding blood lost from placental separation from the uterus. This was later categorized and encoded as

0 - </= 250 ml
1 - > 250 ml

3 - Duration of wound healing- this was recorded in weeks as the time interval immediately after episiorrhaphy until a REEDA total score of 0 was obtained. This was later categorized and encoded as:

0 - < 2 weeks
1 - >/= 2weeks

METHODOLGY

A) STUDY DESIGN: Randomized Double-Blind Controlled Trial

B) SETTING AND POPULATION

> The population included all service patients who delivered via normal spontaneous delivery and underwent median episiotomy and repair at 34 to 42 weeks age of gestation at a tertiary Medical Center.

Those excluded from the study were participants who underwent or had:

1. Fundal push
2. Perineal support
3. Forceps delivery
4. Episiotomy with anal sphincter and rectal extension
5. Vaginal infection one week prior to delivery

C) METHODOLOGY PROPER

All pregnant women who consulted for prenatal care were screened via a checklist on the inclusion and exclusion criteria. Written informed consent was obtained from the eligible pregnant women after thorough explanation of the purpose and procedures of the study. With the informed consent signed, randomization of the participants to their respective treatment groups was done once completion of the second stage of labor commenced. This means that the assignment to treatment groups using computer generated numbers was conducted after delivery of the baby. Those participants who signed the informed consent prior to delivery but whose pregnancy was terminated via cesarean section were withdrawn from the study and were adequately informed regarding such circumstance.

Those assigned to Group A underwent episiorraphy with policresulen solution application. The solution was applied using a 10 x 10 cm gauze soaked in a 25 ml 36 % policresulen solution which was dabbed on the episiotomy site for 2 minutes prior to repair. For those assigned to Group B, episiorraphy was done after the application of normal saline solution soaked in a 10 x 10 cm gauze on the

episiotomy site. The principal investigator prepared the soaking solution just prior to application.

A calibrated bag was used to collect the blood which dripped from the episiotomy wound and from the uterus. One end of the bag was placed under the buttocks of the patient in lithotomy position, while the receptacle of the bag for the blood was made to hang down overlying the lower half of the Kelly pad. Aside from the blood collected from the calibrated bag, the number of fully soaked operative sponges used during the episiorrhapy were counted. The actual number were multiplied by 60 ml which is the estimated amount of blood that a fully soaked gauze would contain. The total estimated amount of blood was recorded as the sum in millimeters obtained from the calibrated bag and sponges from the time of episiotomy until episiorrhaphy was completed. With regards to the blood coming from the separation of the placenta from the uterus, it was segregated and was excluded from the measurement of blood loss. This was done by placing another plastic bag over the calibrated bag during delivery of the placenta.

Episiorrhaphy was done by continuous closure of the vaginal mucosa and submucosa using absorbable chromic 2-0 or 3-0 suture. The vaginal mucosa was approximated in a continuous interlocking technique. A continuous technique of closure was used to close the fascia and muscles of the incised perineum. The continuous suture was then carried upward as a subcuticular stitch to close the skin. The final knot was tied proximally to the hymenal ring. The episiorrhaphy was done by the second year resident on duty.

The participant was informed and educated on the adverse effect associated with policresulen which is local irritation. If this occurred they were instructed to go to the OPD of the tertiary center or at the emergency room or contact the primary investigator to properly address and manage the complications. Fortunately there was no report of such event in this study.

The participants were assessed for wound healing on weeks 1, 2, 3, 4 and 6 postpartum. This follow-up schedule was based on the recommended postpartum follow up by ACOG (American College of Obstetrics and Gynecology). Assessment of wound healing was conducted using the REEDA scale. This scale involves a scoring system assigned for the particular characteristic feature of the wound obtained during evaluation on each follow up. The characteristics observed were the presence of redness, edema, ecchymosis, discharge and approximation of the episiotomy site.[12,13] The wound healing scoring system parameters was provided in the data collection tool. The resident assessor ticked or checked the appropriate blank for the actual score. The total score was obtained from the sum of the 5 parameters. Zero (0) was the minimum score while fifteen (15) was the maximum score. The higher the score the poorer the wound healing. The postpartum week from which a score of 0 was obtained was recorded as the duration of wound healing.

A standard data collection tool was used to record the data gathered from this study. The patient as well as the resident assigned to assess blood loss and wound healing were blinded to the treatment received by the patient.

D. DETERMINATION OF THE SAMPLE

The sample size was derived from the average yearly number of all service admissions who underwent normal spontaneous delivery with episiotomy and repair at our tertiary Medical Center OB-GYN Department for 3 years. A computerized sample size calculator was used derived from the website of Creative Research System at www.surveysytem.com. With a confidence interval of 95 % and a confidence level of 0.05%. The number of participants required to participate in this is 100 wherein 50 women will be allocated to each treatment arm.

DATA ENTRY AND ANALYSIS

The data was entered and encoded using Microsoft Excel and was analyzed using Intercooled Stata Version 9. Univariate analysis such as mean, median, mode and range were used to describe the participant's actual age, age of gestation, gravidity and parity; as well as the operative time, duration of wound healing and amount of blood loss. Frequency distribution was used to describe the proportion of the participants according to category of blood loss, operative time and wound healing. Comparison of the mean of the above mentioned parameters between those participants who underwent episiorrhapy with and without policresulen solution application, were done using T-Test. Regarding the comparison of the categories of the parameters being evaluated between the two treatment groups, chi-square was used.

ETHICAL CONSIDERATION

An informed consent was obtained from the eligible participants. This provided them the information on the nature and purpose of the study, and the possible adverse complications that may arise from the study. The treatment administered to the participants was free of cost. The participants were given assurance on the confidentiality of the results by protecting their identity through the use of number codes on the data collection tool. The participants were given the prerogative to withdraw from the study without incurring penalty. All participants were informed regarding the outcome of the study. Expenses for the policresulen solution and

possible postpartum complication was guaranteed to be shouldered by the primary investigator.

RESULT

There were 100 participants included in the trial and they were equally distributed per treatment arm. The age range of our participants was 18 to 44 years-old with a mean age of 28.24 years. The participants had a gravidity range of 1 to 5 and parity of 0 to 5. Both gravidity and parity have a mean of 2. The age of gestation of their pregnancy ranged from 34 to 41 weeks with the mean of 37.99. There were no statistically significant differences in the baseline characteristics of the participants between the two treatment groups (Table 1).

Regarding the operative parameters being evaluated in this study, both the operative time and estimated blood loss were noted to be significantly different between the two treatment arms. With policresulen application on the episiotomy site, there was a significantly shorter duration of episiorrhaphy with a mean of 20.9 minutes as compared to no treatment on the episiotomy wound with a mean of 53.8 minutes. The estimated mean blood loss was also found to be significant lesser among the participants in the policresulen group (195.2 ml) when compared with the mean of those in the control group (373.8 ml). (Table 2)

The only post-operative parameter observed in this study was the duration of wound healing. The participants where in policresulen was applied during episiorrhaphy was found to have shorter healing period having a mean of 1.42 weeks as compared to those who did not have policresulen treatment on the episiotomy site with a mean of 2.14 weeks. This difference was observed to be statistically significant. (Table 2)

Likewise, when the proportion of participants according to operative and postoperative parameters were compared, there was statistically significant differences observed between episiorrhapy with and without policresulen application. Most of the participants (43/50) in the policresulen group had an operative time of less than 30 minutes. While all of the participants in the control group have had 30 minutes or longer duration of episiorrhaphy. Aside from these, majority of the participants in the policresulen group had an estimated blood loss of less than or equal to 250 ml (47/50) as compared to those in the group without treatment (9/50). A greater proportion of the participants in the policresulen treatment group (36/50) achieved a REEDA score of 0 in less than 2 weeks as compared to those in the no treatment group (21/50). (Table 3)

With regards to occurrence of adverse events, none was reported during the perinatal and immediate post-operative period. During the 6 weeks follow-up period no such events were documented.

Table 1. Comparison of mean baseline characteristics of respondents between episiorrhapy with and without application of policresulen solution

Parameters	With Policresulen mean (±SD) n=50	Without Policresulen mean (±SD) n=50	P-value
Age (in years)	27.88 (±0.74)	28.6 (± 0.68)	0.23
Gravidity	1.86 (±0.13)	1.72 (± 0.13)	0.77
Parity	1.80 (±0.14)	1.62 (± 0.13)	0.82
Age of Gestation	37.64 (±0.21)	38.3 (± 0.21)	0.28

Table 2. Comparison of the mean operative and postoperative parameters between episiorrhapy with and without application of policresulen solution

Parameters	With Policresulen mean (±SD) n=50	Without Policresulen mean (±SD) n=50	P-value
Operative time (minutes)	20.92 (± 0.90)	53.8 (± 1.79)	< 0.001
Estimated blood loss (ml)	195.2 (± 5.69)	373.8 (± 16.14)	< 0.001
Duration of Wound Healing (weeks)	1.42 (± 0.09)	2.14 (± 0.17)	0.0003

Statistical test done: t-test statistically significant p-value <0.05

Table 3. Comparison of the proportion of participants according to the operative and post-operative parameters between episiorrhaphy with and without application of policresulen solution

Parameters	With Policresulen n (%) N=50	Without Policresulen n (%) N=50	P-value
Operative time (minutes)			
< 30	43 (86)	0 (0)	< 0.001
≥ 30	7 (14)	50 (100)	
estimated blood loss (ml)			
≤ 250	47 (94)	9 (18)	< 0.001
> 250	3 (6)	41 (82)	
duration of wound healing (weeks)			
< 2	36 (72)	21 (42)	0.002
≥ 2	14 (28)	29 (58)	

Statistical test done: chi-square statistically significant p-value <0.05

DISCUSSION

Episiotomy is known to facilitate vaginal delivery. It is performed to further widen the vagina and prevent untoward genital tract lacerations, hematoma and excessive bleeding.[1,2] It was mentioned in the literature that bleeding is the most common complication of vaginal delivery and may be secondary to blood vessels that are transected during episiotomy. Sometimes a simple compression with gauze at the site of bleeding may produce hemostasis however if bleeding does not stop suturing is necessary to ligate the bleeders. Improper technique of episiorrhaphy and failure to adequately ligate the bleeders may eventually lead to hematoma formation, faulty wound healing and wound dehiscence.[4] With these possible complications the obstetrician will resort to techniques or agents during episiorrhaphy that could further enhance hemostasis and prevent complications. An added benefit that an obstetrician would like to achieve is proper and shortened wound healing of the episiotomy site.

To date, there were no studies yet conducted with regards to the benefits of policresulen solution on episiotomy wound. However various studies were done on the effect of policresulen on cervical erosions, cervicitis, skin wounds and lesions for local treatment such as burns, limb ulcers, pressure ulcers and chronic inflammation.[8,9,10]

A study conducted by Evi EG et al by year 2011 on the effect of ABS solution on episiotomy wound showed a significant lesser blood loss on the episiotomy but no significant effect observed on the operative time.[7] However, ABS solution is not available in our country. It works as hemostatic agent as it produces coagulation of proteins, platelets and blood cells in vitro. This mechanism is almost similar with the hemostatic action of Policresulen solution which is available in our setting.[7]

In our study, we used policresulen solution in lieu of ABS solution. The result observed was almost similar to the effect of ABS reported by Evi EG et al. Blood loss was similarly lesser with policresulen. However, in our trial aside from reduced blood loss a significant shorter operative time was observed as well. This may be explained by the difference in the level of surgical competency of the surgeon on the two mentioned studies. In the previous study, there were different surgeons who did the episiorrhaphy of varied year level and years of practice. While in our study, the residents who performed the episiorrhaphy were of the same year level. On the study made by Erwing et al in 2004 on factors affecting the duration of episiotomy repair, they reported that it most commonly affected by the level of competency of the surgeon at 72% of the time followed by the type of episiotomy done.[14]

Based on the 2010 edition of Chinese Pharmacology,[15] policresulen solution may also have favorable effect on wound healing since aside from selective coagulation, it also promotes tissue regeneration and epithelial recovery of devitalized tissues. Re-epithelization is favored by reactive hyperemia in the treated area and by stimulation of the granulation of normal tissues. This was established in the study conducted by Zedan et al that policresulen application on the buccal mucosa of guinea pig enhances the expression of E-cadherin on the devitalized tissue.[10] It is an important factor in mediating cell-to-cell adhesion hence promoting epithelial regeneration. Wound healing property of policresulen was evaluated on the clinical

trial done by Shivanna et al on the efficacy of policresulen solution on simple type of cervical erosion.[9] Benefits of policresulen treatment on cervical erosion has a curative effect (92.1 %) particularly for the simple type of mild to moderate cervical erosion same curative effect (92%) as with the study by Gong-Zetong Tao et al on cervical erosion after LEEP operation.[9] Both noted to be cured on 1st week posttreatment. However, as stated before no study yet done on the benefits of policresulen on episiotomy wound. Our study showed that application of policresulen on episiotomy wound promotes better wound healing resulted to a shorter duration of wound healing time (1.4 +/- 0.009 weeks) similar to the length of period of healing observed for those with cervical erosion. Fortunately, no adverse effects reported on the study. Histologically, buccal mucosa, ectocervix as well as the vaginal mucosa has same type of lining epithelium which is squamous epithelium and it was stated by Zedan et al that policresulen has a greater permeability on the said type of epithelium hence promoting a better wound healing effect.[10] This may support the result of our study on the wound healing effect of policresulen on the episiotomy wound.

CONCLUSION

In conclusion, policresulen solution application on the episiotomy wound has a potentially beneficial effect on operative outcome. This was exhibited by shorter operative time and lesser blood loss. Post-operatively, its advantage is that it can hasten wound healing. These favorable effects were achieved with no documented adverse effects. Hence, policresulen application is a promising agent reducing complications associated with episiotomy.

LIMITATION OF THE STUDY

This study was only conducted among uncomplicated cases of vaginal delivery. Hence, the results cannot be generalized. Since we did not include those at high risk for wound healing complications as well as increased blood loss such as those with mediolateral episiotomy and medical complications such as diabetes mellitus.

RECOMMENDATION

Further studies can be made on the evaluation of hemostatic and wound healing effect of policresulen solution on different types of episiotomy. May also include in the next study those with co-morbids that are associated with poor wound healing such as gestational diabetes mellitus and those with vaginal infection prior to vaginal delivery. This will further explore if those at high risk for faulty healing of episiotomy wound will also benefit from the potential effect of policresulen. ■

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