

The Effects of Continuous and Interrupted Episiotomy Repair on Pain Severity and Rate of Perineal Repair: A Controlled Randomized Clinical Trial

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ABSTRACT

Introduction: Perineal pain is the most common complaint after episiotomy. It imposes extra pressure on mothers who attempt to adapt to their new conditions. Therefore, the present study was performed to compare pain severity and perineal repair in two episiotomy repair methods. **Methods:** In this clinical trial, 100 primiparous women who referred to hospitals of Tabriz (Iran) for delivery were randomly allocated into two groups of 50 to undergo either continuous or interrupted episiotomy repair. A visual analogue scale (VAS) was used to evaluate pain severity 12-18 hours after episiotomy repair and also 10 days after delivery. Perineal repair rate was also assessed using the REEDA (redness, edema, ecchymosis, discharge, and approximation) scoring scale. The obtained data was analyzed in SPSS₁₅. **Results:** Statistical tests did not show significant differences between the 2 groups in pain severity variations or REEDA scores at 12-18 hours and the 10th day after delivery. However, the mean required time for repair and the number of used threads were significantly lower in the continuous repair group ($p < 0.001$). **Conclusion:** The results of this study showed that pain severity and episiotomy repair rate were similar in the two methods. Nevertheless, shorter time of repair and fewer threads were required using the continuous repair method. Therefore, this method would provide better services for mothers and reduce the required time, energy, and costs.

Introduction

Episiotomy is an incision of perineal body to prevent perineum injuries and facilitate and accelerate the second stage of labor. It is one of the most common surgical procedures on women whose prevalence differs in various geographical regions.

Joseph Delee was the first person to suggest routine episiotomy for all primiparous women and most multiparous women. His suggestion influenced the science of midwifery for 60 years. Global prevalence of this surgery has been reported as 30-90% of all vaginal deliveries.^{1,2} The prevalence of episiotomy in primiparous women was reported

as 97.3% in Tehran hospitals (Iran) in 2009 which was higher than the rates in other parts of the world.³

Having had a surgery in the perineum increases pain and discomfort and interferes with normal activities during postpartum recovery. It even influences the relation between the mother and the infant.^{4,5} The application, place, time, and repair method of episiotomy are currently among the most discussed subjects of midwifery science.⁶

Although there are various techniques to close the incision of episiotomy, hemostasis and restoration of anatomical structure of the incision site without additional suture are fundamental aspects of success in all me-

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thods. At present, two common methods of repair include continuous and interrupted methods.⁷ In a European study, while 30% of the studied hospitals used interrupted sutures, 47% employed interrupted sutures to repair the muscles of perineum. However, there were no definite strategies in 23% of the hospitals.⁸ Most researchers believe that using continuous sutures to repair vagina and perineum muscles and skin is less painful than the interrupted method.⁹ A study in Turkey reported the continuous method to cause less pain at a short time after delivery and faster perineum repair. The method also economized consumption rate of the suture thread.¹⁰ An English study randomly allocated 1542 women with second-degree perineal laceration or episiotomy into 2 groups to receive either continuous or interrupted methods of repair. Perineal pain was less in the continuous method group on the 2nd and 10th days and even until 12 months after delivery.⁸ A similar study was conducted on 445 women with episiotomy and second-degree perineal laceration in Spain. Although no significant difference in pain rate was found between the two groups on the 2nd-10th days and 3 months after delivery, the continuous method required less thread and the suture ends repaired more quickly.⁶

In delivery units of clinics, the difference in mothers' satisfaction rates after delivery with various methods of repair is implicitly observable.

Despite the importance of finding the best strategies to provide effective prenatal care and reduce postpartum complications, limited studies with contradictory results have been performed in this field. On the other hand, maternal pain relief and helping mothers in taking appropriate care of their infants are completely essential according to the World Health Organization (WHO). Therefore, we were determined to compare the two episiotomy repair methods in women who referred to educational-treatment centers in Tabriz (Iran). We then tried to present the

best method of episiotomy repair with the least complications for mothers.

Materials and methods

This study was a controlled randomized clinical trial. After registration of the study in the Iranian Registry of Clinical Trials (IRCT), it was approved by the ethics committee of Tabriz University Medical Sciences (ethical code: 9054). Written informed consents were then received from 100 eligible primiparous women who referred to educational-treatment centers in Tabriz for delivery.

The sample size was estimated according to a study by Malekpoor *et al.*¹¹ with $\alpha = 0.05$, a power of 0.9, $SD_1 = SD_2 = 4.1$, mean of pain severity in interrupted method = 5.3, and mean of pain severity in continuous method with an estimated pain reduction of 20% = 4.24 and also considering the average pain severity. Women were only included if they had no cardiovascular problems, diabetes, anemia, bleeding after delivery, and manual ejection of placenta. The subjects were randomly allocated into two groups of continuous repair method ($n = 50$) and interrupted repair method ($n = 50$). Random allocation was performed by a person other than the researchers using A and B codes which were put in sealed envelopes with sequential numbers. A number was allocated to each mother in terms of the priority of presence in delivery room. The envelopes were not opened until the start of episiotomy repair. Allocation sequence was generated by a person other than the researcher and with 4-piece and 6-piece blocking in the two groups of continuous and interrupted repair (Figure 1). Mothers were first prioritized to enter the delivery room. They were then randomly categorized using sealed pockets containing sequential codes. The pockets were not opened until the beginning of the episiotomy repair. Data was collected using a checklist including some individual, social, and mid-wifery characteristics whose validity had

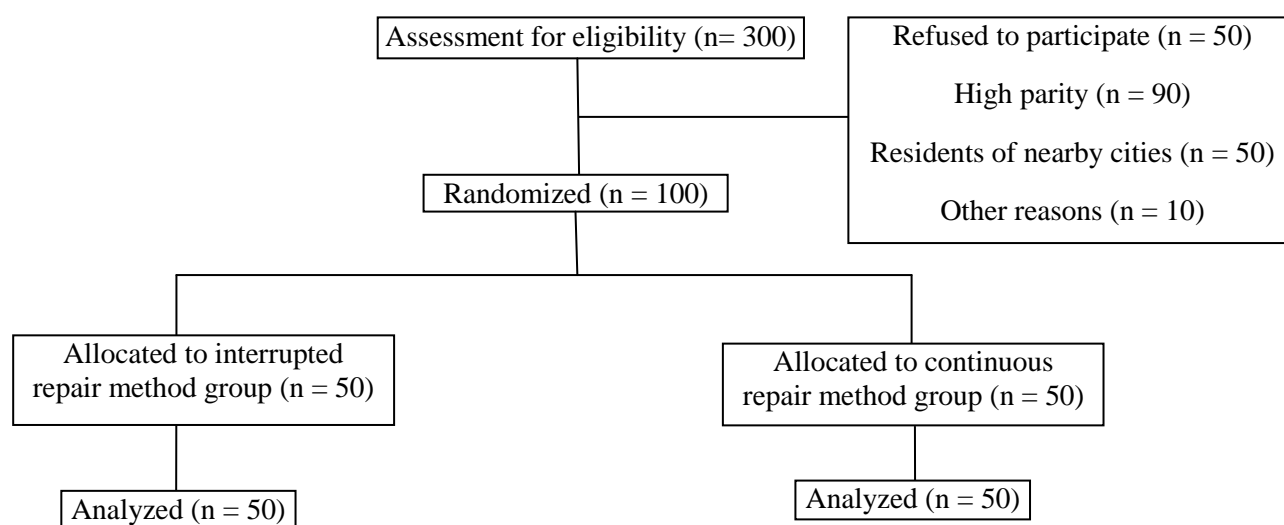


Figure 1. Flow diagram of the clinical trial

been confirmed by content validity method. A standard visual analogue scale (VAS) was used to determine pain severity. Moreover, the wound healing was assessed by the

standardized and valid REEDA (redness, edema, ecchymosis, discharge, and approximation) scoring scale. Since the same tools were used by Malekpoor et al. in 2009 and their reliability was confirmed,¹¹ there was no need to reconsider their reliability. In all parturients, the area of episiotomy was numbed using 5 cc of lidocaine 2%. In the group with continuous episiotomy repair method, the mucosa and submucosa were stitched continuously and the suture was cut after closing the vaginal incision and reapproximating the cut margins of hymenal ring. Afterwards, in one group, the fascia and incised muscle of perineum were repaired by 3 or 4 interrupted sutures. A downward continuous suture was also used to unite the superficial fascia. To complete the episiotomy repair, a few interrupted sutures were placed through the skin and subcutaneous fascia and tied loosely. In the other group, episiotomy was repaired using the continuous method in which mucosa and submucosa were stitched continuously. After closing the vaginal incision and reapproximating the cut margins of the hymenal ring, the suture was directed to stitch the area

of perineum incision. Continuous suture was used in order to stitch the fascia and incised muscles of perineum. An upward continuous suture was then made as a subcuticular stitch and the final tie was formed in proximal position toward the hymenal ring. The obstetric characteristics of mothers were recorded in a form using their documents and observations of the researcher. Pain severity and perineum repair rate were evaluated by the mentioned tools 12-18 hours after the repair (at least with a 4-hour interval from the last sedative) and on the 10th day after delivery. All subjects were prescribed with 10 ibuprofen 400 mg pills and were ordered to take one pill every 6 hours. In case using additional sedatives by mothers, the number was written in related forms. An assistant researcher, who was unaware of repair type, measured pain severity after episiotomy and the rate of perineum repair at two times. It is noteworthy that the subjects were also unaware of repair type.

The obtained data was analyzed by descriptive statistical methods including number, percentage, mean, and standard deviation (SD). Moreover, t-test was used to compare the mean values in independent groups. All analyses were performed in SPSS¹⁵ (SPSS Inc., Chicago, IL, USA). P values less than 0.05 were considered as statistically significant.

Results

Most subjects were housewives and had elementary school education. Their age ranged from 23 to 25 years. According to their statement, their income and expenditure were equal. Table 1 shows that the two groups were similar in terms of some individual and social factors such as mother's age, education, job and income and some obstetric characteristics.

Table 2 shows the mean (SD) of pain severity and REEDA scores in the two groups

at 12-18 hours and the 10th day after delivery. Statistical tests did not show significant differences between pain severity and REEDA scores between the two groups ($p > 0.05$). According to Table 2, the mean required time for episiotomy healing and the number of used threads in were less in the continuous method group compared to the interrupted method group. However, none of the women in either group needed additional sedatives.

Table 1. Demographic and obstetric characteristics in primiparous women with episiotomy in the continuous and interrupted repair groups (n = 50 in both groups)

Variable	Continuous Group	Interrupted Group
Age* (years)	23.8 (5.4)	25.5 (1.5)
Education Level		
Elementary School	18 (36)	16 (32)
Secondary School	14 (28)	14 (28)
High School Diploma	15 (30)	16 (32)
University Degree	3 (6)	4 (8)
Job		
Housewife	43 (86)	36 (42)
In-House Employee	6 (12)	12 (24)
Work Outside	1 (2)	2 (4)
Income		
Earn Less than Expenditures	10 (20)	17 (34)
Earn Equal to Expenditures	40 (80)	33 (66)
Earn High than Expenditures	0 (0)	0 (0)
Kind of Pregnancy		
Planned	44 (88)	38 (76)
Unwanted	6 (12)	11 (22)
Prenatal Care		
Regular	50 (100)	50 (100)
Irregular	0 (0)	0 (0)

Values are expressed as n (%) * Age is reported as mean (SD).

Table 2. Pain intensity and the required time and threads for episiotomy repair in the continuous and interrupted repair groups (n = 50 in each group)

Variable	Continuous Group	Interrupted Group	df	t	p
Pain Intensity					
12-18 Hours after Delivery	3.15 (1.82)	2.93 (1.97)	98	6.73	0.63
The 10th Day after Delivery	0.73 (0.34)	0.77 (0.38)	98	6.70	0.86
Difference in Pain Intensity	2.41 (0.52)	2.16 (0.56)	98	1.21	0.22
The Repair Rate (REEDA Score)					
12-18 Hours after Delivery	6.10 (2.40)	6.79 (2.47)	98	1.52	0.13
The 10th Day after Delivery	1.39 (0.41)	1.76 (0.56)	98	1.04	0.39
Difference in REEDA Score	4.70 (1.2)	5.02 (0.89)	98	0.03	0.97
Required Time for Repair (minutes)	5.34 (0.83)	6.54 (0.97)	98	6.66	< 0.001
Number of Used Threads	1.08 (0.27)	1.92 (0.27)	98	15.33	< 0.001

Values are expressed as mean (SD).

Discussion

This research was performed in order to compare pain severity and repair rate of episiotomy site between continuous and interrupted repair methods. Therefore, 100 eligible pregnant women were randomly allocated into two groups of 50 to undergo the continuous or interrupted methods. All women were evaluated 12-18 hours after the repair and on the 10th day after delivery. In general, the results of this research showed that pain severity and rate of perineum repair were similar in the two repair methods of episiotomy (continuous and interrupted methods) during 12-18 hours and on the 10th day after delivery. Similarly, An Australian study by Valenzuela et al. evaluated pain severity and use of sedatives on 2nd and 10th days and 3 months after delivery in two groups with continuous and interrupted methods of episiotomy repair. It did not show a significant difference in pain severity between the two groups.⁶ In England, Kettle et al. reported pain severity to be considerably less in continuous repair method until the 10th day. Although the difference was persistent until 12 months after delivery, it was not statistically significant.⁹ In another study, Kettle et al. sug-

gested that the difference in pain could be caused by the increased of pressure on the sutures due to edema. While the pressure is distributed through the suture in the continuous method, the sutures are placed vertically on the wound in the interrupted method.¹²

Sereshti et al. performed a double-blind clinical trial on 148 women who delivered in Shahrekord (a city in Iran). They compared continuous and standard repair methods in terms of repair time and the number of used threads and also pain severity and infection rates two hours and 40 days after delivery. In contrast to our study, they found significant differences between the 2 groups in pain severity, infection rates, repair time and the number of used threads. This inconsistency might have been caused by differences in sample size and time of pain determination.¹³

Moreover, since the sutures are placed through the subcutaneous tissue in the continuous method, they do not stimulate nerve terminations of the skin. In contrast, interrupted sutures are placed on the skin.⁹ In a Turkish study, Kokonali et al. showed the continuous repair method to result in significantly less severe pain than the interrupted method¹⁰ which is in contrast with our results. This difference between the two studies could have been due to sample size, pain evaluation intervals, and mothers' parity. In fact, Kokonali et al. used a larger sample size and measured the severity of perineum pain during different activities at the first and 10th days postpartum and also during sexual intercourse 6 weeks after delivery using a VAS. Moreover, while we assessed primiparous women with episiotomy, Kokonali et al. evaluated second-degree laceration and episiotomy without considering the parity.¹⁰ Although the repair methods can cause dyspareunia, we measured pain severity before the start of mothers' sexual activity. Hence, the complications of the selected type of repair method can be ignored probably.

In the present study, the rates of episiotomy healing during 12-18 hours and on the 10th day after delivery were insignificantly different between the two groups with continuous and interrupted sutures. In Pakistan, Perveen and Shabbir compared the methods and types of using threads in continuous and interrupted repair methods of episiotomy on the 10th day and the 6th week after delivery. Similar to our results, they failed to establish a significant difference in the rate of wound healing.¹⁴ Among the numerous factors which can affect perineal repair, the type of thread and the number of sutures seem to be the most effective. Since we used the same type of thread in both methods and only the number of sutures differed between the groups, no significant difference was detected between the two groups. Unfortunately, we could not find a study to prove this hypothesis. On the other hand, based on Cole's theory, episiotomy normally requires

2-3 weeks to heal.¹⁵ However, we evaluated the mothers on the 10th day postpartum. In this study, the mean required time for episiotomy repair in the continuous and interrupted method groups were 5.34 and 6.54 minutes, respectively. Therefore, the required time for repairing in the continuous method was almost one minute less than the other method. Likewise, Valenzuela *et al.* reported the continuous method to require one minute less than the interrupted method.⁶ Moreover, Kokonali *et al.* estimated significantly less time to be required in the continuous method.¹⁰ Valenzuela *et al.*,⁶ Kettle *et al.*,⁹ and Morano *et al.*¹⁶ reported similar results.

Furthermore, we found the numbers of needed threads for episiotomy repair in the continuous and interrupted methods to be 180 and 192, respectively. Similar to our results, Valenzuela *et al.* in Australia,⁶ Kokonali *et al.* in Turkey,¹⁰ and Perveen and Shabbir¹² in Pakistan used less thread in the continuous method.

One of the limitations of the present research is that pain is generally a mental phenomenon which can be influenced by different factors such as culture and socioeconomic status. It is thus not controllable in all conditions. We attempted to eliminate the confounding factor by randomized allocation of the subjects. Therefore, there were no statistically significant differences between the two groups such factors. It is however recommended to carry out a research under the same title to evaluate long-term pain and healing rate using the continuous and interrupted methods. The relation between the repair method and dyspareunia needs to be assessed as well.

Conclusion

Although the findings of this research showed pain severity and rate of perineal repair to be similar in the continuous and interrupted repair methods of episiotomy, continuous method was more preferable due to fewer number of used threads and the shorter required episiotomy repair time. Therefore, it can be concluded that continuous su-

tures would provide mothers with better services, need less time and energy, and shorten the duration of mothers' stay on the delivery bed, and finally reduce costs.

Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interests in this study.

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