

## The Effect of Phenytoin Cream in Comparison with Betadine Solution on Episiotomy Pain of Primiparous Women

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### ABSTRACT

**Introduction:** Episiotomy is a medical intervention in delivery which is still one of the most common surgical procedures. Topical phenytoin cream possesses analgesic, anti-bacterial and anti-inflammation effects as well as accelerating tissue healing. Hence, the present study aimed to compare the effect of topical phenytoin cream with betadine solution on pain reduction of episiotomy incision. **Methods:** In this double-blind clinical trial, 120 primiparous women with episiotomy that were referred to Al-Zahra Medical Center of Tabriz in 2010 were randomly allocated to phenytoin or betadine groups (60 in each group). Pain assessment was determined and compared using visual analog scale (VAS) in the first 24-hours and then in the 10<sup>th</sup> day after delivery. Data analysis performed using chi-square, independent t-student and repeated measurements ANOVA tests. **Results:** The mean pain intensity in the first 24-hours postpartum was  $4.39 \pm 1.11$  in phenytoin group and in betadine group it was  $7.11 \pm 1.48$  ( $p < 0.001$ ). In the tenth day after delivery, mean pain intensity in phenytoin and betadine groups was  $0.72 \pm 1.04$  and  $3.45 \pm 2.00$  respectively ( $p < 0.001$ ). **Conclusion:** The results showed that local phenytoin is effective on reducing the pain of episiotomy wound and can be replaced with betadine.

### Introduction

One of the medical interventions in labor is episiotomy which is used to broaden perineum.<sup>1</sup> The incidence of episiotomy has a wide geographical variation so that it differs from 8% in Netherland to 20% in Great Britain and 50% in the United States and 99% in some Eastern European countries.<sup>2</sup> Klossner et al. believed although episiotomy is not recommended as a routine surgery, still it is conducted in almost 40% of deliveries.<sup>3</sup> In Iran, no accurate rate is available for episiotomy, however, a study in Al-Zahra Medical Center of Tabriz City reported its prevalence as 70.6 percent.<sup>4</sup>

Although routine use of episiotomy has

been declined in developed countries, in Asian countries women with short perineum and strong tissue are prone to wide ruptures, therefore, the usage of this method still is common.<sup>5</sup> Episiotomy, like any other surgical incision, has some side effects including pain and discomfort in perineum, bleeding, infection, abscess, and hematoma and wound departure. Although most of these complications are not life threatening, a number of women are affected by these problems.<sup>6</sup>

Episiotomy incision site is located where there is a high possibility of contamination with vagina and rectal bacteria. Therefore, the possibility of infection would be increased. In addition to infection, there are other complications

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such as motion limitation, short scar tissue and cosmetic problems as well as delayed healing and prolonged perineal pain which make sexual activity dysfunction.<sup>6</sup> Since episiotomy has physiologic, psychological and socioeconomic effect on women, not only making decision to do so but also the quality of subsequent care is of high importance. Many measures have been suggested to reduce perineal pain and accelerate wound healing such as individual hygiene, taking shower, clean up the perineum, sitting in hot and cold bathroom, betadine, using medications like local lidocaine, acetaminophen, non-steroidal anti-inflammatory drugs, infrared irradiation and herbs.<sup>7</sup>

Today, betadine (Povidone Iodine) is used as an antiseptic substance for episiotomy wounds in most hospitals. However, there is considerable controversy about using betadine. Cooper *et al.* in California showed that betadine with 1/20 concentration causes fibroblasts and keratinocytes devastation and inhibits lymphocyte and consequently causes delayed healing and subsequently pain.<sup>8</sup> In a study by Fati *et al.* in Mashhad, side effects of betadine in comparison with clotrimazole and nystatin were more in treatment of candida vaginitis.<sup>9</sup>

Topical phenytoin had a considerable role in different wounds such as skin ulcers, burns, diabetic foot ulcers, bed sores, leprosy and periodontal diseases. All these studies indicated the extraordinary effects of this medication in wounds healing and analgesics.<sup>10-12</sup> Topical phenytoin usage can increase the amount of extracellular substance and connective tissue protein, reduce collagenase enzyme activity and increase collagen production. These effects cause acceleration of granulation tissue and also acceleration in healing and pain reduction.<sup>13</sup> Moreover, topical phenytoin has stabilizing effects on irritable membranes such as membranes of nerve and muscle cells which acts as a local anesthetic.<sup>14</sup>

Considering the mentioned effects of topical phenytoin and disadvantages and risks of betadine in wound healing which exacerbates episiotomy pain intensity, and since phenytoin cream

is a cheap and available drug and many studies were done in this field (but not about perineal wound), the present study aimed to compare the effect of topical phenytoin cream and Betadine® (Povidone-Iodine) in relief of episiotomy pain in primiparous women.

## Materials and methods

This was a double-blind clinical trial study with a parallel design which was done in 2010 in Al-Zahra Medical Center. According to pilot study, sample size calculation estimated 120 subjects that were selected among 1200 women referred to the hospital for natural vaginal delivery who underwent episiotomy and fulfilled inclusion criteria. Using the following website ([www.randomizer.org](http://www.randomizer.org)), the samples were randomly divided into intervention (phenytoin cream and placebo betadine solution) and control group (betadine solution and placebo cream). Four subjects were excluded due to the exclusion criteria and 116 participants completed the study.

Inclusion criteria comprised of term pregnancy, primiparous, no special diet, age of 18-35 years, no special disease, absence of malnutrition (for appropriate production of collagen and fibroblasts, they are dependent to oxygen and nutrients provided by new blood vessels), no specific medication, no smoking, no alcohol or narcotics consumption, literacy, no obesity (BMI should not be over 29), willingness to participate in the study, no history of previous injury or surgery, no visible lesions in the perineal, natural pregnancy, no anemia, no postpartum hemorrhage, no prolonged delivery, no need to resuscitate infant and not using vacuum. Exclusion criteria were postpartum hematoma, abscess or infection, widen episiotomy, perineal re-manipulation, improper drug usage and unwillingness to continue the study.

Visual analog scale (VAS) was used to assess pain. In pain assessment, zero indicated no pain, scores 1-3 mild pain, 4-7 moderate pain and 8-10 indicated severe pain. This international scale widely and frequently has been used in articles and dissertations and its validity

and reliability have already been confirmed.<sup>15</sup>

The researcher, after receiving the introduction letter from the related school and permission from Ethics Committee, introduced herself to the maternity hospital authorities, went to postpartum ward and introduced herself to the patients and if the individuals were qualified, the written consent completed by the patients and then the questionnaire containing demographic and obstetrical information were completed for participant. The mothers then were informed about the study process and by Rand List Software were randomly divided into intervention and non-intervention groups. In order to blind the study, in industrial laboratory of school of pharmacy, sixty 30g empty metal tubes with 1% phenytoin sodium were purchased and another sixty 30g empty metal tubes with placebo were provided and filled with placebo by an expert under the supervision of pharmacist. The placebo was exactly similar to phenytoin cream. All the tubes were packed and encoded in aseptic conditions by ointment filling machine.

The purchased betadine solutions from drugstore were prepared in similar color and bottle size. Placebo solution which was made from a colored substance was mixed with water filled in the bottles similar to betadine and then the bottles were encoded. All these stages were done by the pharmacist supervisor without informing the researcher.

Data collection check-lists for gathering individual, social, physiologic and obstetrical information were assessed and approved by seven school members of the university and then were given to the subjects to complete

them. The mothers in both groups were asked to use that cream once a day after washing hands with soap and water and cleaning and drying the perineal area and also use the diluted solution three times a day (according to hospital routine). The perineal area should have been kept dry. The required information and necessary instructions were given to the patients using face-to-face training. A form was given to participants containing hygiene information, diet type, researcher's phone number, recalling the 10<sup>th</sup> day follow-up, referral place and a table to mark the number of days that mothers used cream and solution. Pain assessment in episiotomy site was done using 10-degree VAS in 24 hours postpartum. Thereafter, the researcher was informed about the way patients used medications by phone call. Participants were reminded about the next time of visit to the clinic in the 10<sup>th</sup> day after delivery. In the tenth day, pain intensity was measured and recorded again using VAS. Data analysis performed using chi-square, independent t-student and repeated measurement ANOVA tests using SPSS Software, version 16.

## Results

There was no significant difference between the two groups in terms of social, obstetrical, delivery and physiologic characteristics including age, education, intended or unintended pregnancy, birth weight, delivery agent, the episiotomy healing agent, gestational age, frequency of changing pads, type of used toilet, breastfeeding type and vital signs. Table 1 illustrates some of these factors.

**Table 1.** Demographic characteristics of primiparous mothers undergoing episiotomy in phenytoin and betadine groups

Variables	Phenytoin n = 59*	Betadine n = 57*	statistical Indicators
Education	Literacy	2 (3.4)	3 (5.3)
	Primary school	15 (25.4)	12 (21.4)
	Guidance school	14 (23.7)	17 (29.9)
	High-school graduates or more	28 (47.5)	25 (43.9)
Healing agent	Resident	32 (54.2)	30 (52.6)
	Midwife	14 (23.7)	15 (26.3)
	Instructor or midwifery student	7 (11.9)	8 (14)
	Intern	5 (8.5)	1 (1.8)
	Professor	1 (1.7)	3 (5.3)
Age of mothers (year)	23.46 ± 4.27	24.23 ± 4.59	t = 0.93 df = 114 p = 0.35

\* Values are expressed as number (percentages)

The mean pain intensity in the first 24-hours postpartum in phenytoin and betadine groups was  $4.39 \pm 1.11$  and  $7.11 \pm 1.48$  respectively ( $p < 0.001$ ). In the tenth day, this item in phenytoin and betadine groups was  $0.72 \pm 1.04$  and  $3.45 \pm 2.00$  respectively ( $p < 0.001$ ). In the first 24-hours of postpartum 1 subject had a severe pain in phenytoin group but in betadine group, 23 subjects had severe pain. In tenth day postpartum, 32 subjects had no pain in phenytoin group and in betadine group 7 subjects had no pain.

## Discussion

The results of the present study showed that phenytoin sodium cream was effective on pain relief of episiotomy. A clinical trial was done on 37 patients in Qaem Hospital in Mashhad entitled as "the comparison of topical tretinoin 0.5% with phenytoin cream 0.1% in healing chronic wounds". The results showed that in the groups treated with tretinoin and phenytoin,  $43.4 \pm 44.7$  and  $44.9 \pm 4.26$  had been reduced from wound extent respectively. In addition, in phenytoin group, while 55.6% of wounds had no pain before treatment, after the treatment 100% of the cases had no pain. However, in tretinoin group, 78.9% had no pain before treatment but after the treatment 84.3% of the cases had no pain.<sup>16</sup> In a systematic review by Shaw *et al.* topical phenytoin was compared with silver sulfadiazine in healing burn wounds. After two weeks, there was a significant difference in terms of cultured bacteria, pain reduction and healing in topical phenytoin group with silver sulfadiazine.<sup>10</sup> They showed that in group treated with phenytoin sodium and placebo, healing duration lasted 10 and 20 days respectively, in other words, topical phenytoin accelerated wound healing by 10 days.<sup>10</sup>

The results of a clinical trial by Bhatia and Prakash on 32 patients titled as "the effect of topical phenytoin in diabetic foot ulcers healing" showed that the patients in the intervention group who used phenytoin once day in-

dicated that in this ulcer size group in the fourth week had 25.7% reduction and in the eighth week had 38.6% reduction and in the non-intervention group, in the fourth and eighth weeks had 18.3 and 27.5% reduction respectively.<sup>14</sup>

Topical phenytoin possessing anti-inflammatory properties causes pain reduction and healing acceleration. In addition, by reducing permeability of nerve membrane it acts like a local anesthetic.<sup>12</sup> The limitations of this study was lack of accurate information about proper usage of medications, no control on individual hygiene, proper diet, stress and other factors influencing the wound healing. The findings of this study showed that phenytoin sodium cream can be used due to availability, cost-effectiveness and its extraordinary effects on different types of ulcers and wounds like episiotomy wounds and perineal ruptures.

## Ethical issues

None to be declared.

## Conflict of interest

The authors declare no conflict of interest in this study.

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