Cukurova Medical Journal
ÇUKUROVA ÜNİVERSİTESİ TIP FAKÜLTESİ

Cukurova Med J 2020;45(3):891-898
DOI: 10.17826/cumj.694074

ARAŞTIRMA / RESEARCH

Effect of chlorhexidine gluconate solution on healing process in care of episiotomy wound

Epizyotomi yarasının bakımında klorheksidin glukonat solüsyonunun iyileşme sürecine etkisi

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Cukurova Medical Journal 2020;45(3):891-898

Abstract

Purpose: Determination of the effect of chlorhexidine gluconate (CG) solution (containing 70% alcohol) on the process of episiotomy wound healing.
Materials and Methods: This is a semi-experimentally designed study with pre-test post-test control group. In the research, after the episiotomy intervention 45 puerperal, those were treated with routine hospital care formed the control group, the other 45 puerperal who were treated with Serum Physiological (SP) solution formed the 1st group and the remaining 45 puerperal who were treated with CG solution formed the 2nd treatment group.
Results: When the REEDA scale of the puerperals are evaluated; The wound care with the CG solution was more effective in terms of reduction of the redness, edema, ecchymosis, and drainage in the episiotomy area and in the closure of the wound edges. Statistically lower levels of pain complaints were found in the patients who used CG solution in episiotomy treatment compared to those who received routine care and SP solution. In episiotomy treatment, the CG solution appeared to be an effective and promoting product for wound healing.
Conclusion: We concluded that CG solution is an effective wound care product, which contributes to wound healing in patients with episiotomy.
Keywords: Chlorhexidine gluconate, episiotomy, wound healing

Öz

Amaç: Klorheksidin Glukonat (KG) solüsyonunun (%70 alkol içeren) epizyotomi yarasının iyileşme sürecine etkisini belirlemek.
Gereç ve Yöntem: Ön test son-test kontrol gruplu yarı deneysel tasarımlı bir araştırmadır. Araştırmada epizyotomi uygulaması sonrası rutin hastane bakımı yapan 45 lohusa kontrol grubunu, Serum Fizyolojik (SF) solüsyonu kullanan 45 lohusa 1. uygulama grubunu ve KG solüsyonu kullanan 45 lohusa 2. uygulama grubunu oluşturdu.
Bulgular: Lohusaların REEDA skoru değerlendirildiğinde; KG solüsyonu ile yapılan yara bakımı epizyotomi bölgesinde kızarıklık, ödem, ekimoz, akıntıyı azalttı ve yara kenarlarının yaklaşmasında da KG solüsyonu ile bakımın daha etkili idi. Epizyotomi bakımında KG solüsyonu kullanan lohusaların rutin bakım alan ve SF solüsyonu ile bakım yapanlara göre istatistiksel olarak anlamlı olarak daha düşük düzeyde ağrı deneyimlediği saptandı.
Sonuç: Epizyotomi bakımında KG solüsyonunun yara iyileşmesini destekleyici ve etkin bir bakım ürünü olduğu görüldü.

Anahtar kelimeler: Klorheksidin glukonat, epizyotomi, yara iyileşmesi

INTRODUCTION

Episiotomy, the surgical enlargement of the vaginal orifice by an incision in the perineum during the second stage of labor [1]. Episiotomy rate is 8% in the Netherlands and 99% in Western Europe[2]. In Turkey, it is applied to 96% of first births[3]. In recent years, the use and necessity of episiotomy have been discussed and it has been emphasized that it should be preferred in cases where it is really necessary[4,5].

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Geliş tarihi/Received: 25.02.2020 Kabul tarihi/Accepted: 22.05.2020 Çevrimiçi yayın/Published online: 31.08.2020

Childbirth and all interventions at birth can lead to significant changes in the quality of lives of the woman and her family[6]. Among these interventions, episiotomy is a widely used procedure[4,7,8]. Many complications and undesirable situations can be encountered in the episiotomy, especially in the mediolateral episiotomy. The most commonly observed complications are infection, pain, discomfort and prolonged wound healing in the postpartum period[6,7]. The duration of the healing in episiotomy scars and perineal tears is crucial to prevent these complications[7]. The wound should be assessed for edema, swelling, tenderness and discharge and also for localized pain. Puerperal infections are costly in terms of delayed mother infant interaction, lactation difficulties, prolonged hospital stay or readmission in hospital and increased expenses[9]. For this reason, episiotomy care is very important in preventing complications, eliminating fears and anxieties of women regarding the episiotomy and ensuring effective wound care[7,10].

As the episiotomy has physiologic, psychologic and social–economic consequences, not only the decision to do it but also the manner of performance and the quality of future cares are important[9]. Given the scientific work on the care of the episiotomy wound, no scientific study investigating the efficacy of the CG solution, another antiseptic agent used in wound care, was observed despite antiseptic solutions such as povidone iodine and rivanol were found to be analyzed. In this regard, it was aimed to investigate the effect of the CG solution on the recovery of episiotomy wound.

MATERIALS AND METHODS

This is a semi-experimentally designed study with pre-test post-test control group to investigate the effect of CG usage on the recovery process of episiotomy wounds. The population of the study consisted of puerperal women who undergone natural childbirth and episiotomy in the hospital during the research was conducted. The sample size was determined based on previous studies[2,10,11,12]. The sample size was calculated by the power analysis having a statistical power of at least 90% and an error rate of 5% (SPSS 20.0). In cooperating a potential 20% lost to follow up trial was designed to induce a total of 135 participants. The study was performed with a total of 135 puerperal women including a control group (45 women) with routine hospital care, and two experimental groups one of which was treated with CG solution (45 women) and the other one was treated with SP solution (45 women) for episiotomy wound care.

Including criteria were at least literate and between the ages of 18 to 44 years, primiparous delivery, and normal delivery with head presentation (37-41 gestational age) no allergies and vaginal infections, no postpartum hemorrhage and no placenta retention, no psychologically and physically systemic diseases (thyroid dysfunction, hypertension, and cardiovascular disease etc.). Exclusion criteria were median episiotomy, multiple pregnancy, the use of vacuum or forceps during childbirth, smoking and anemia.

The withdrawal criteria consisted of the failure to visit the obstetrics clinic of the hospital on the follow-up days, unwillingness tocontinue cooperation, the failure to apply the ointment and keep up with the routine treatment as per the researcher instructions, developing allergic reactions to chlorhexidine solutions, having sexual intercourse in the first 10 days after delivery, perineal manipulation after episiotomy healing, severe hemorrhage in the first 24 hr after delivery, and the use of wound healing medications over the course of the study.

Measures

The data for the study were collected using a Structured Information Form, REEDA Scale (Redness, Edema, Ecchymosis, Discharge, Approximation) and the Visual Analog Scale (VAS).

Structured information form

It was created by the researchers in accordance with the relevant literature for the purpose of study. In the form, in addition to socio-demographic characteristics such as age, education, and working status of the patient; birth information such as previous abortion or miscarriage, duration of birth phases, and birth weight[2,9,10,11,12,13,14] and VAS and REEDA score evaluations were presented.

REEDA Scale (Redness, Edema, Ecchymosis, Discharge, Approximation)

Davidson introduced the REEDA scale first. Scale is composed of 5 factors showing perineal wound healing; as redness, edema, ecchymosis, discharge, and approximation. Each factor takes a value between 0 and 3, and a total score (0-15) is obtained to evaluate these five healing factors. High scores indicate the presence of more tissue trauma[15].

Visual Analog Scale (VAS)

It is a measure that is shown horizontally or vertically in the length of 10 cm which ends with "No Pain" at one end and "Unbearable Pain" at the other end and is used in the evaluation of pain[16].

Procedure

This study was conducted according to the Helsinki Declaration principles. Permissions were obtained from the hospital administration and the ethics committee (İstanbul University- Cerrahpaşa Medical Faculty Clinical Research Ethic Committee, Number: 83045809/604.01/02-264756, Date: 03.12.2014), to collect the research data. The aim, methodology, objectives, side effects and risks of research were explained to each participating woman by the researcher before the treatment. Both oral and written informed consent was obtained from those who agreed to participate in the research.

After the pregnant women in the labor room being informed by the researcher about the purpose, scope, duration and method of study, the informed consent forms explaining that they agreed to participate voluntarily in the research wereread and signed by the volunteers. The pregnant women were given verbal assurances that their identities and the individual information would not be disclosed to anyone other than the investigator or that the information would not be allowed to be accessed by others or not be used for any other purposes.

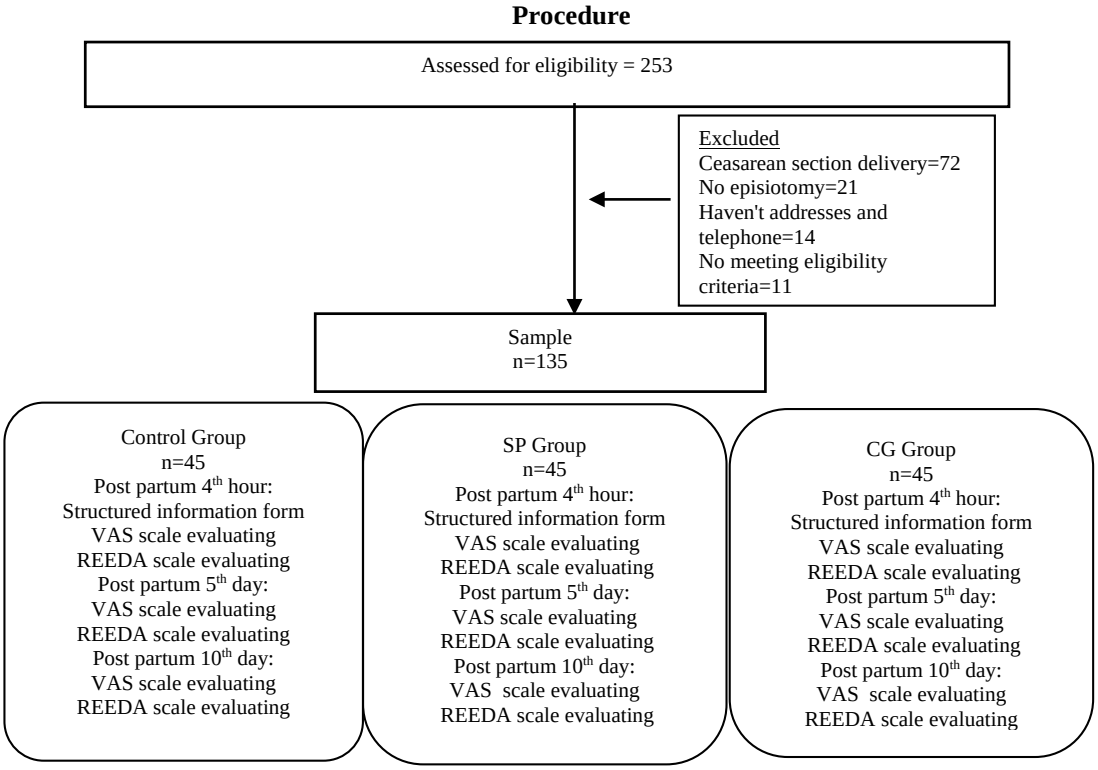

Figure 1. Flow chart of the study

After 4 hours from birth, the puerperals were provided a 15-20 min. training about general information about episiotomy care and points to be taken care of, hand and perineal hygiene, importance of the nutrition, sleeping and resting during the postpartum period, and how to sleep and rest, by the researcher. Before the training started, it was noted that the vitals of the puerperals were stable and it was not their breastfeeding time. At the end of the training, a training brochure with all the information was given to the puerperals. At the end of the training, the first wound evaluation (REEDA) with

the help of a ruler and pain assessment (VAS) were performed by the researcher, by paying attention to privacy. The researcher explained and practiced how to treat wound with the help of SP solution in the SP group (1st experimental group), and CG solution and sterile gauze in the CG solution group (2nd experimental group). The puerperals in the treatment groups were applied the wound care solutions with a mirror for twice a day for 10 days with at least 8 hours of intervals. For full solution absorption, the underwear was worn after 15 to 20 minutes from the treatment and the perineal area was not contacted with water.

The puerperals in all three groups were visited by the researcher at the end of the fifth postnatal day, and the recovery status of the episiotomy area (under sufficient illumination) was assessed by a ruler aid and REEDA scale and pain status by VAS. The researcher, making phone calls with the postpartum women for two times on the 4th and 9th days of postpartum, asked whether there was any problem and took information about the wound healing situation. These calls took 3-4 minutes and the postpartum women were invited to the hospital for wound evaluation on the next day. In the women, who participated in the research during the study, not any negative situation or complication were seen. The final assessment (postpartum day 10), of the episiotomy area was conducted by another nurse who was trained in the collection of data and did not know which puerperal was in which group.

Statistical analysis

The data analysis was performed by using SPSS 16.0 (Statistical Package for the Social Sciences) program. The mean, standard deviation, and percentile values were calculated for statistical analysis from the descriptive information of the puerperals. In the study, chi-square (x^2) test and Kruskal-Wallis test were used to determine the difference among the groups, variance analysis (ANOVA) was used in repeated measures to compare the wound healing and pain score averages among the groups, and Tukey test was used in the post hoc comparison. For statistical significance, p value was accepted to be less than 0.05.

RESULTS

The mean age of the puerperals in the study was 23.03 ± 3.75 years and 71.1% of them were in the 18-24 age group. The mean educational time of the puerperals was 9.16 ± 2.82 years. In the postpartum period, 54.8% of the puerperals used analgesics and, 65.2% used antibiotics. It was determined that 90.4% of the puerperals had never had miscarriage or abortion, 97% had an assistant for care and 96.3% of them had breastfed their newborns. The mean newborn weights was 3.171 ± 3.68 gr (Table 1).

Table 1. The distribution of descriptive features of puerperals (n = 135)

Variables		Control Group Mean±SD		SP Care Mean±SD		CG Care Mean±SD		Total		F / p
Age		22.75±3.65		22.62±3.67		23.73±3.92		23.03±3.75		1.177/0.311
Education		9.40±3.17		8.95±2.61		9.16±2.82		9.17±2.86		0.279/0.757
Newborn Weight (gr)		3.195±400.69		3.153±52.68		3.17±3.68		3.171±3.68		0.161/0.851
		n	%	n	%	n	%	N	%	
Working	Yes	8	17.8	6	13.3	9	20	23	17	0.693
	No	37	82.2	39	86.7	36	80	112	83	
Abortion/ Curretage	Yes	3	6.7	6	13.3	4	8.9	13	9.6	0.551
	No	42	93.3	39	86.7	41	91.1	122	90.4	
Breastfeeding	Yes	42	93.3	43	95.6	45	100	130	96.3	0.109
	No	3	6.7	2	4.4	0	0	5	3.7	
Care	Yes	42	93.3	44	97.8	45	100	131	97	0.223
	No	3	6.7	1	2.2	0	0	4	3	
Analgesic	Yes	27	60	26	57.8	21	46.7	74	54.8	0.396
	No	18	40	19	42.2	24	53.3	61	45.2	
Antibiotic	Yes	28	62.2	34	75.6	26	57.8	88	65.2	0.183
	No	17	37.8	11	24.4	19	42.2	47	34.8	

[b] Chi -squire test, * SD = standart deviation; SP: Serum Physiological; CG: Chlorhexidine Gluconate

The mean of the first stages of delivery was 9.94 ± 4.60 hours and 42.2% of them experienced hamper for 3-8 hours. In the study, there was no difference between the hamper period and episiotomy care practices (p>0.05).

There was no statistically significant difference among the groups in terms of wound healing status according to episiotomy area maintenance practices (p>0.05) (Table 2). It was determined that 42.2% of the patients included in the study had experienced hamper for 3-8 hours, 20% had 9-10 hours, and 37.8% had more than 11 hours. There was no difference between the hamper period and the episiotomy region maintenance practices (p>0.05). There was no statistically significant difference among the groups in terms of average pain scores according to episiotomy area maintenance practices (Table 2).

There was no statistically significant difference among groups in terms of redness, edema, ecchymosis and discharge in wound edges according to episiotomy maintenance practices (p>0.05) (Table 3).

Table 2. Comparison of REEDA scale and VAS score averages of puerperals (n = 135)

REEDA	Control Group Mean±SD**	SP Care Mean±SD	CG Care Mean±SD	F p
In 4th hour	2.26±1.94	3.26±2.22	2.84±2.60	5.594
In 5th day	2.00±2.38	1.66±1.63	1.22±1.22	0.000*
In 10th day	1.35±2.48	1.17±1.72	0.24±0.57	
VAS Score				
In 4th hour	2.36±2.35	1.58±1.69	1.40±1.67	0.431
In 5th day	1.84±2.50	1.17±1.67	0.98±1.63	0.786
In 10th day	0.87±2.19	0.49±1.21	0.37±1.42	

According to episiotomy treatment applications, there was a statistically significant difference among the groups in terms of REEDA scores for the closure of wound edges (Table 3). According to the Tukey test result, which was used to identify the difference in groups, the closure score on the wound edges was significantly lower in puerperals using CG solution than those of the routine care takers and SP solution users.

Table 3. Comparison of REEDA scale averages of the puerperals according to the treatment of episiotomy area

REEDA	Time	Control Group n=45 Mean±SD**	SP Care n=45 Mean±SD	CG Care n=45 Mean±SD	F p
Redness	4th hour	0.47±0.73	0.38±0.58	0.27±0.69	0.488
	5th day	0.27±0.69	0.13±0.46	0.07±0.25	0.121
	10th day	0.16±0.52	0.20±0.63	0.02±0.15	
Edema	4th hour	0.69±0.87	1.09±0.67	1.04±0.93	5.864
	5th day	0.51±0.92	0.36±0.57	0.24±0.48	0.601
	10th day	0.20±0.63	0.18±0.49	0.00±0.00	
Echymosis	4th hour	0.49±0.92	0.87±0.99	0.93±1.12	4.584
	5th day	0.36±0.91	0.29±0.55	0.33±0.48	0.825
	10th day	0.20±0.66	0.04±0.30	0.00±0.00	
Discharge	4th hour	0.02±0.15	0.29±0.59	0.13±0.34	2.979
	5th day	0.16±0.42	0.16±0.42	0.07±0.25	0.108
	10th day	0.16±0.47	0.13±0.40	0.02±0.15	
Approximation	4th hour	0.60±0.50	0.64±0.57	0.49±0.51	2.226
	5th day	0.82±0.68	0.76±0.53	0.51±0.51	0.002*
	10th day	0.64±0.91	0.62±0.53	0.16±0.42	

*Repeated Measures test ANOVA, p < 0.01, Post-hoc tests for pairwise comparison with Tukey HSD adjustment, **SD = Standart Deviation; REEDA: Redness, Edema, Ecchymosis, Discharge, Approximation; SP: Serum Physiological; CG: Chlorhexidine Gluconate

DISCUSSION

Episiotomy, one of the most frequently performed surgical procedures in obstetric clinics, is an attempt to significantly affect the lives, daily activities and quality of lives of the puerperals[6]. A proper episiotomy care helps to the recovery and prevention of complications that may occur in the postpartum period[17]. In this study, we investigated the effects of CG (containing 70% alcohol) on wound healing process after episiotomy along with the comparison with SP and routine hospital care protocols.

Many factors can negatively affect wound healing, such as the proliferation of antibiotic-resistant microorganisms in hospitals and the growth of pathogenic microorganisms in the wound area[18]. The use of local antiseptics for wound care is important for the rapid recovery of the wound and prevention of the growth of microorganisms on the wound area. Because of this, local antiseptics nowadays, play a key role in wound care and treatment[19]. The chlorhexidine gluconate solution, one of the most commonly used antiseptics in the clinic, is a biguanide group topical antiseptic agent. Chlorhexidine gluconate is effective against gram positive and gram negative bacteria, fungi and tuberculous bacilli[20]. It is known that CG is long-lasting by attaching deeply to the stratum corneum layer of the epithelium[21].

In our study, no statistically significant difference ($p>0.05$) among the individuals and delivery related characteristics of the puerperals as similar studies ($p>0.05$), shows that equivalence between experiment and control groups was achieved and supported the study's suitability for semi-experimental design[2,9,11]. Findings showed that, the total scores of REEDA and VAS in the CG group were lower, pain and approximation at the wound edges was faster in the CG group compared to the SP group and control group. The closure of the wound edges in the wound healing process is a complementary step[22]. The REEDA scale that systematically assessed the recovery of episiotomy wound in our study was found to be lower in CG group than the other groups in terms of the score average, might be associated with the CG solution's effects on promoting and not suppressing the wound healing process, and absence of its cytotoxic and irritant effects on tissues. This study was the inability to evaluate individual and genetic differences that may be effective in wound healing. The perineal pain was evaluated according to women's self expressions, individual differences in the sensation and perception of pain may have an effect.

Marzouk et al. found that REEDA score of puerperals that uses lavender oil (sitz bath) in treatment is 2.03 ± 1.77, and REEDA score of puerperals that uses saline solution (sitz bath) in treatment is 3.93 ± 3.63, and so they reported that there was a faster wound healing in the puerperals that conducts treatment with lavender oil[17]. When compared with the findings of Marzouk et al. it has been seen that REEDA points are lower in the treatment that is done with CG solution in comparison to the treatment with lavender oil[17]. It has been seen that wound healing is faster in episiotomy treatment when compared to other research findings[23,24,25].

Asgharikhatooni et al., found that REEDA score of puerperals that applies treatment with lotions containing 40 grams Equisetum arvense ointment, is 0.8 ± 1.3 and 3.5 ± 1.6 in the control group[23]. When we compared the findings of our study, it was seen that the REEDA score of the puerperals who applied episiotomy treatment with the cream containing Equisetum arvense ointment, was higher than the puerperals that applied care with CG solution.

Attarha et al. found that, according to the REEDA score which was measured 10 days in episiotomy care, the ecchymosis score was 0.37 ± 0.16 and the discharge score was 0.36 ± 0.10 in the puerperals using SP solution[12]. In our study, postpartum 10th day ecchymosis score was found as 0.04 ± 0.30 and discharge score was found as 0.13 ± 0.40 in the group of puerperals treated with SP solution. When compared with Attarha et al. study, it was determined that the ecchymosis and discharge score values of the group of puerperals who were using SP solution in our study were lower[12]. This result showed that the personal hygiene practices, perineal tissue and physical differences of puerperant women might be effective on ecchymosis and discharge. In our study, it was observed that the mean score of discharge on the 10th postnatal day was lower in the treatment group than in the other study groups. Similarly to our study, in a study that compares wound irrigation with 3-antibiotic solution (1 g cefazolin, 80 mg gentamicin and 50.000 IU bacitracin) in patients who underwent bilateral breast reconstruction surgery applying wound care with CG solution; it has been detected that lower infection was observed in the patient group that applied a CG solution treatment[26].

In our study, it has been determined that average point of wound edges approaching towards each other is 0.64±0.91 in puerpera group that receives routine episiotomy region, it is 0.62±0.53 in the group that receives treatment with SP, it is 0.16±0.42 in the group that receives treatment with CG. In the study by Eghdampour et al. the approach score of the wound edges according to the episiotomy evaluation performed on the 5th postpartum day is 0.45±0.50 in the puerpera group that uses a lotion containing aloe vera; it is 0.56 ± 0.50 in the puerperals that uses a lotion containing calendula, and there is no difference between two groups in terms of approach score of the wound edges[25]. When we compare our study findings, it has been seen that approach score of the wound edges in puerpera group that uses CG is lower. In the study by Eghdampour et al. it has been presumed that higher approach score of wound edges being may be associated with the evalution of the wound being made on the 5th day of postpartum[25].

When reviewing the literature on the care of the episiotomy wound, no scientific study was found to investigate the effect of the CG solution on the healing status of this. In the literature, it has been observed that antiseptic solutions, hot-cold applications, laser treatment, and recently aromatherapy agents are often used as care products in episiotomy care[9,12,27,28]. The discussion section was presented in the light of the limited literature on the subject due to the different methodology studies, different days of episiotomy area wound assessments and the use of different care products.

The present study has some limitations. The lack of the control of the physical, psychological condition of the puerperal women even though individual differences existed. It was not possible to control the hygiene conditions and nutrition of the puerperal women. The perineal tissue, genetics and individual changes could not be assessed by the investigator. The pain was measured according to the self-assessment of the individuals and the results of the study could not be projected to all puerperal women. Therefore, results of the study can be generalized to this study group.

In line with the results obtained from the research; it was found that wound healing rates of puerperals who applied 2% (containing 70% alcohol) CG solution in episiotomy area were higher. There was no statistically significant difference among the groups in terms of redness, edema, ecchymosis and discharge REEDA score at wound edges according to episiotomy area maintenance practices (Routine hospital care, SP group, CG group) ($p > 0.05$). The CG solution was more effective in the wound edge closure.

The results of this study showed that CG could be an effective treatment for pain relief and episiotomy wound healing. Repeating the study with different maintenance solutions in a larger sample group. In episiotomy care, 2% (70% alcohol) CG solution can be used safely and after discharge, perineal wound healing track and pain assessment of the puerperals having episiotomy by a nurse can be suggested. Further studies are required on the safety and the efficacy of different doses of the treatment and also on its potential side effects.

Yazar Katkıları: Çalışma konsepti/Tasarımı: AÇ, MŞ; Veri toplama: AÇ; Veri analizi ve yorumlama: AÇ, MŞ; Yazı taslağı: AÇ, MŞ; İçeriğin eleştirel incelenmesi: AÇ. MŞ; Son onay ve sorumluluk: AÇ, MŞ; Teknik ve malzeme desteği: AÇ; Süpervizyon: AÇ, MŞ; Fon sağlama (mevcut ise): yok.
Etik Onay: Bu çalışma için İstanbul Üniversitesi Cerrahpaşa Tıp Fakültesi Etik Kurulundan 14.11.2014 tarih ve 74311748-199/244904 no ile onay alınmıştır.
Hakem Değerlendirmesi: Dış bağımsız.
Çıkar Çatışması: Yazarlar çıkar çatışması beyan etmemişlerdir.
Finansal Destek: Yazarlar finansal destek beyan etmemişlerdir.
Author Contributions: Concept/Design : AÇ, MŞ; Data acquisition: AÇ; Data analysis and interpretation: AÇ, MŞ Drafting manuscript: AÇ, MŞ; Critical revision of manuscript: AÇ, MŞ; Final approval and accountability: AÇ, MŞ; Technical or material support: AÇ; Supervision: AÇ, MŞ; Securing funding (if available): n/a.
Ethical Approval: This study was approved by the Ethics Committee of Cerrahpasa Medical Faculty of Istanbul University on 14.11.2014 with 74311748-199/244904 no.
Peer-review: Externally peer-reviewed.
Conflict of Interest: Authors declared no conflict of interest.
Financial Disclosure: Authors declared no financial support

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