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VACUUM EXTRACTION IN CESAREAN DELIVERY: AN ANALYSIS OF MATERNAL AND NEONATAL OUTCOMES

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ABSTRACT

Introduction: Vacuum extraction during particularly difficult cesarean delivery use by some surgen. This procedure may decrease the length of incision and extension of uterine incision and complications of C/S such as post operation bleeding and neuropathic pain. However, some cases reported that the routine use of vacuum in cesarean delivery may cause the neonatal subgaleal hemorrhage and intracranial hemorrhage to increase.

Material and methods: This Study has 114 participants who had elective cesarean delivery done in two groups; the first group (control: 64 participants) underwent C/S without vacuum extraction, while for the second group (experimental: 52 participants) C/S with vacuum extraction was performed. Bleeding, size of incision, neonatal Apgar score, and presence or absences of extension of uterine incision were evaluated by the surgeon. Each participant and her neonate were followed in two sessions after delivery.

Results: Neonatal subgaleal hematoma and intracranial bleeding did not occur in any groups. Neonatal Apgar score of vacuumed group was 50 (96.2%), and 66 (98.5%) of control group which was good (Apgar score 8-10). Incisional site burning sensation and extension of uterine incision not different between two groups (P>0.05).

Conclusion: The result of this study suggest that the routine use of vacuum extraction in cesarean section is safe for the neonate and mother but there is not a significant change seen in the size of skin incision. Incisional site burning sensation and extension of uterine incision were decreased too.

INTRODUCTION

Cesarean delivery is a common procedure in obstetrics (Betran *et al*., 2007; Lunthaporn, 2013). The estimated rate of cesarean section (CS) is 15% worldwide (Lunthaporn, 2013). During the past decade, this trend has been on increase in some countries (Lunthaporn, 2013). The principal indications for CS include multifetal pregnancy, previous Cesarean Section, macrosomia, abnormal presentations, dystosia, vaginal bleeding, nonreassuring fetal heart rate, and certain maternal medical conditions. In this procedure, after abdominal incision and opening the peritoan, the surgeon performed the uterine incision and fetal head bring-out with abdominal compression. During this process, extension of uterine incision, rapture of uterine arteries, and moderate to severe bleeding may happen.

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Sometimes, extension of abdominal incision may be necessary after which the local sensory nerves (such as illiohypogastric and illioinguinal) get damaged, causing post operation numbness, burning sensation in surgical site, and referral pain of groin (Rab *et al*., 2001; Cardosi *et al*., 2002; Kim *et al*., 2005; Ducic, 2006).Vacuum extraction is commonly used in the second stage of vaginal delivery (ACOG, 1994; Ezenagu *et al*., 1999). But some surgeons use vacuum extraction during particularly difficult cesarean delivery (Dan *et al*., 2002). Using vacuum extraction during caesarian delivery may decrease the length of incision and extension of uterine incision. Thus, it can reduce the complications of CS such as post operation bleeding and neuropathic pain. However, some cases reported that the routine use of vacuum in cesarean delivery may cause the neonatal subgaleal hemorrhage and intracranial hemorrhage to increase (Steven and Clark, 2008; Uchil *et al*., 2003). Moreover, some authors believe that prolonging the incision-to-delivery time assisted with vacuum increases the risk of neonatal depression compared to

traditional cesarean delivery technique (Arad and Linder, 1986). As mentioned before, vacuum assisted cesarean has been confirmed for difficult cases (Dan *et al*., 2002) but there is no clear evidence for routine use of vacuum for cesarean delivery. More importantly, neither the benefit nor the safety of elective vacuum use at CS has been established in the medical literature. Hence, we designed this study to compare the benefits and complications (maternal & neonatal) of routine use of vacuum extraction in cesarean delivery.

The data was analyzed by SPSS software version 16. Fisher exact test and chi square were used to find the correlation between case and control groups.

RESULTS

Neonatal complications

Neonatal subgaleal hematoma and intracranial bleeding did not occur in any groups.

Table 1. Shows the maternal and neonatal complications in each groups

		yes	no	value	df	pvalue	OR
neonatal sub galeal hematoma	group 1	0	52(100%)				
	group 2	0	64(100%)				
neonatal intracanial hemorage	group 1	0	52(100%)				
	group 2	0	64(100%)				
incision site burning pain	group 1	14(26.7%)	38(73.1%)	0.564	1	0.333	0.226
	group 2	13(19.4%)	54(80.6%)				
extension of uterine incision	group 1	4(7.7I%)	48(92.3%)	0	1	1	1.033
	group 2	5(7.5%)	62(92.5%)				
		good (8-10)	bad (7&less)				
neonatal apgar score	group 1	50(96.2%)	2(308%)	0.05	1	0.58	0.379
	group 2	66(98.5%)	1(1.5%)				

MATERIALS AND METHODS

Study Design and Ethical Consideration

This study was approved by Research Committee of Medicine Faculty at Jahrom University of Medical Sciences in December 2011. The protocol was also approved in Ethics Committee of Jahrom University of Medical Science. This Study was conducted as a double blinded random controlled trial (RCT) in Peymanieh Hospital i.e. an educational hospital in Jahrom, Iran during 2012. Using convenience sampling method, 114 participants were selected from pregnant women who had elective cesarean delivery done. The participants were interviewed to evaluate their willingness to participate in the study, followed by completion of an informed consent.
The exclusion criteria were multiple pregnancy, more than 2 pervious cesarean sections, and emergent cesarean deliveries. Participants were free to exit the study whenever they wished. The pregnant women enrolled in two groups; the first group (control: 64 participants) underwent cesarean section without vacuum extraction, while for the second group (experimental: 52 participants) cesarean with vacuum extraction was performed.

All operations were done by an experienced obstetrician who was not aware of research hypothesis. Bleeding (measured by suctioning), size of incision, neonatal Apgar score, and presence or absence of extension of uterine incision were evaluated in the operation room by the surgeon. Each participant and her neonate were followed in two sessions, the first was in post-operation day, and the second was after 2 weeks. In each follow-up, the neonatal scalp was examined and neurologic exam was done for newborns by a medical student to rule out the subgaleal hematoma and intra cranial hemorrhage. Mothers were also asked about incisional site numbness and burning sensation, through yes/no questions in each follow-up.

Neonatal Apgar score of vacuumed group was 50 (96.2%), and 66 (98.5%) of control group which was good (Apgar score 8-10) (P-value = 0.58). Table 1 displays the neonatal complications and compares it among the two groups.

Maternal complications

Size of skin incision in vacuumed group was 14.72 ±3.37 and in control group was 16.09±2.09, P-value= 0.008 (Chart 1). Incisional site burning sensation existed in 14 patients (26.7%) of vacuumed group and in 13 patients (19.4%) of control group (P-value> 0.05). Extension of uterine incision occurred in 4 participants of vacuumed group (7.7%) and 5(7.5%) of control group (P-value>0.05)

Conclusions

The result of this study suggest that the routine use of vacuum extraction in cesarean section is safe for the neonate and mother but there is not a significant change seen in the size of skin incision. Incisional site burning sensation and extension of uterine incision were decreased too. Hence, it seems that more study with larger statistical groups is necessary to demonstrate the benefits of vacuumed cesarean sections.
It is clear that if our hypothesis is approved using this method of delivery, it can decrease the maternal complications without adverse effects on neonates.

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