NEONATAL OUTCOME WITH INSTRUMENTAL VAGINAL DELIVERY: A STUDY AT PNS SHIFA

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ABSTRACT

Objective: To evaluate neonatal outcome in terms of Apgar score after forceps and ventouse delivery in pregnant ladies indicated to have instrumental deliveries.

Study Design: Randomized control trial.

Place and Duration of study: This study was conducted at Labor ward of department of obstetrics & gynecology, PNS SHIFA Karachi, between Dec 2007 to Mar 2008.

Subjects and Methods: The target population were all pregnant subjects who visited labor room for delivery. Out of these patients, subjects who were indicated an assisted vaginal delivery for necessary management of labor were formally requested to participate in the study after various exclusions. Instrumentation was done in only those patients with singleton term pregnancy with cephalic presentation and vertex at + 1 to +3 stations. Patients with an indication for assisted vaginal delivery (n=105), were randomized for ventouse (n=53) and forceps delivery (n=52). Instruments used were Wrigley's outlet forceps and vacuum extractor (V.E) with silicone cups. Data was recorded on specially designed Proforma. Post delivery neonatal outcome in terms of Apgar score at one minute and five minutes were compared between two modalities.

Results: The subjects undergoing forceps delivery had a significantly higher Apgar score (8.36±1.27) at 1 minute in comparison to those subjected to vacuum delivery (7.53±1.56). The differences in Apgar score at 5-minutes (forceps delivery: 9.136 + 1.01 vs vacuum delivery 9.00 + 1.19), were not statistically significant.

Conclusion: Outlet forceps assisted vaginal deliveries had better neonatal outcome in terms of Apgar score in comparison to ventouse.

Keywords: Forceps, ventouse, Apgar score

INTRODUCTION

A painless, less traumatic and healthy neonatal outcomes are the primary goals of any labor process. In routine 10 % of all vaginal deliveries require instrumentation[1]. The choices available for instrumentation include use of outlet forceps and the vacuum extraction through ventouse. The considerations before selection of any specific instrumental method of delivery are multifold starting from the maternal range of injuries to any adverse neonatal outcome.

The use of vacuum extraction and forceps is frequently seen in our country. While the use of outlet forceps has been in clinical practice since decades, recently the trend shift is seen in the direction of ventouse mode of delivery[2]. The factors allowing the rapid acceptance of the later mode of instrumental delivery include lesser incidence of maternal trauma, minimal training requirements for using vacuum extractors and user friendliness[3]. However, the search on medline and pubmed yields contrasting literature about the selection of appropriate method of instrumental delivery. There are studies favoring the time tested outlet forceps to be better instrumental method but on the other hand there is some evidence which suggest its pitfalls[4]. The literature also include studies in which forceps delivery has been termed as better modality of operative vaginal delivery in terms of neonatal outcome[5]. The earlier work focused on the maternal side of problems, including the increased frequency of maternal tears, soft tissue damages and post delivery scarring resulting in the development of procedures like vacuum extraction[2]. However the vacuum extraction procedure is also being critically analyzed for its advantages and side effects[6].

Hence a trial was planned to evaluate the neonatal outcome in terms of Apgar score

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between subjects undergoing vacuum and forceps delivery.

PATIENTS AND METHODS

The target population was all pregnant subjects who visited labor room for delivery. The primary consideration for inclusion into study was singleton pregnancy, gestational age of more than 37 weeks having cephalic presentation with formally approved consent for study. During labor progress, assisted vaginal delivery was considered in patients fulfilling any one of the following criteria:-

- Foetal distress in second stage of labor as evidenced by passage of meconium , abnormal FHR patterns at CTG recordings, umbilical cord prolapse in second stage of labour.
- Maternal indications requiring shortening of second stage of labor in patients with severe cardiac, respiratory or hypertensive disease.
- Prolonged second stage of labor. In nulliparous women, this is defined as lack of continuing progress for three hours with regional anesthesia or two hours without anesthesia. In multiparous women, it refers to lack of continuing progress for two hours with regional anesthesia or one hour without anesthesia.

Subjects having fetal distress in first stage of labor, malpositions like brow presentation, face presentation with mento-posterior position, non-engaged presenting parts, previous 2 L.S.C.S, pelvic contracture or fetal anomalies of obstructive nature, and dead fetus were excluded from the study.

Based upon the above criteria, a total of 105 subjects were selected for assisted vaginal delivery. All the patients were randomly divided into two groups using random number tables. There were 53 patients undergoing ventous delivery and 52 patients were undergoing forceps delivery. On admission a detailed history and examination was carried out. The specific obstetrical examination included: **a-** Abdominal examination to assess the condition and presentation of fetus, and **b-** Digital vaginal examination to record the bishop score of cervix, **c-**Partogram was maintained for all patients, and **d-** Fetal condition was monitored by intermittent auscultation by pinnard fetoscope after every contraction in second stage and intermittent cardiotocography. All patients were administered plain kleen enema. The patients who were complaining of excessive pain were given injection campex to relieve their pain. The patients were kept in first stage till 8.0 cm of cervical dilatation. The respective instrument was applied to the patient in lithotomy position with the head at +1 - **+3** station. Applications were performed in accordance with standard technique recommended by the manufacturer.

Outcome measures:

- The major outcome measures- were Apgar score at 1 and 5 minutes.
- Indication to assisted vaginal delivery including: **a-**fetal distress, **b-**maternal exhaustion, and **c-**Prolonged second stage of labor
- Others including: **a-**Demographics, **b-**Parity, **c-**Gestational age .

Statistical Analysis: All data were entered into SPSS- version 15. Descriptive statistics were used to describe the data.Age and main outcome measure (a numerical category) i.e., Apgar score at 1minute and 5 minutes were compared between subjects undergoing Ventouse and forceps delivery through independent sample t-test. The differences in parity and indications of delivery between the two groups were compared by chi-square test. P-value of <0.05 was considered as significant.

RESULTS

Average age of subjects who underwent forceps delivery was 28.73 years (SD=3.30) and of vacuum delivery was 27.90 years (SD=3.71). Both the groups were compareable with respect to age (P=0.233).

The differences of parity status between subjects undergoing forceps delivery and vacuum delivery remained insignificant (p=0.0624), as depicted in figure-1. Indications of instrumentation in subjects undergoing forceps delivery were fetal distress (42.3%),

maternal exhaustion (28.8%), and prolonged second stage of labor (28.8%); while for ventouse delivery they were fetal distress (37.7%), maternal exhaustion (32.1) and prolonged second stage of labor (30.2). The differences was found to be insignificant (p=0.886) between the two modes of instrumental deliveries.

The subjects undergoing forceps delivery had a significantly higher (P<0.05) Apgar score at one minutes i.e 8.36±1.27 in comparison to subjects with vacuum delivery i.e 7.53 ±1.56 (figure-2). The difference in Apgar score at 5-minutes was statistically insignificant (P>0.05) which is 9.136±1.01 for forceps delivery and 9±1.19 for vacuum delivery (Fig.2).

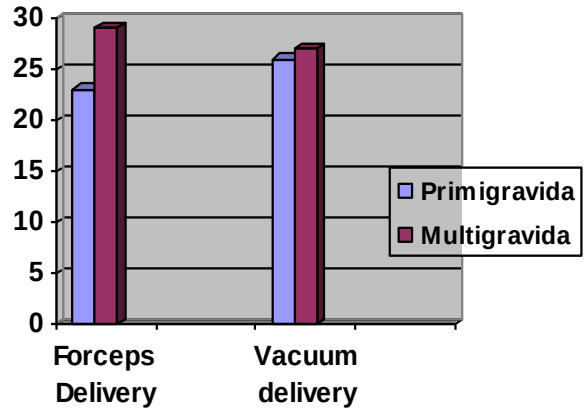

Fig. 1: Differences of parity status between the two groups

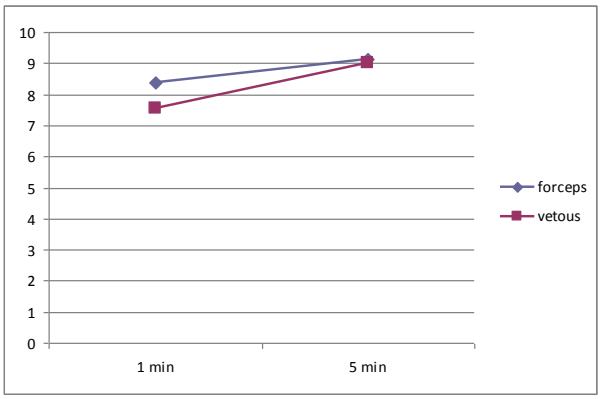

Fig. 2: Apgar score at 1-minute and 5-minutes between subjects undergoing forceps and vacuum delivery.

DISCUSSION

Our study was specifically focused on the comparison of the neonatal outcomes among subjects undergoing either ventouse or forceps delivery after an indication for assisted vaginal delivery. Forceps delivery had a better neonatal outcome in terms of 10 points Apgar score in comparison to ventouse mode. These improvements in Apgar score were more marked at 1- minute than at 5-minutes, where statistical significance was not reached. There are several international and national studies in the literature, which have concluded that forceps deliveries are associated with better neonatal outcomes than ventouse deliveries.[3,7-9] .However, there are few studies which have shown results different to our observations[10-12].

Once we closely examine the evidence generated from various sources, we can have the following: Firstly, the forceps modality of instrumentation was the trend in vogue over the past. It was over the years linked with various maternal side effects like perineal tears, anal sphincter injuries , cervical and vaginal lacerations. This had led to the introduction of ventouse version of instrumental delivery. This method may have reduced some of the complications of instrumentations related to mother but may not be yet proven safe, as recently observed in some studies[13,14]. Secondly, what could be the possible causes to poor neonatal outcomes in deliveries performed through the ventouse method? The probable explanation is that of mechanical factor of the forceps variety that increases the size of exit of fetus by stretching the vaginal walls, while the vacuum modality does this job by simply applying direct pressure on the fetal head. There are studies available in literature, which clearly show the probability of having cephalhaematoma and subgleal haematoma is increased by employing ventouse method of delivery[15]. So this probably can result from the direct mechanical effect of ventouse cup leading to decreased oxygenation and other circulation abnormalities[16]. This finally leads to the probable decreased Apgar score encountered with neonates undergoing ventouse method of instrumental delivery as also observed in our study. Lastly, most of the studies being available in literature are retrospective in nature; and only a few with cross-sectional design. So the evidence

produced by our trial can become a very valuable source for confirming the utility of this version of instrumental delivery

Fetal distress was the commonest indication in selection of instrumental delivery in our selected subjects. These indications to instrumental delivery were not statistically different amongst subjects undergoing forceps and ventouse methods of delivery. Some international studies have shown that fetal distress is commoner in neonates undergoing delivery with forceps, while second stage of labor is more prevalent in ventouse group[17]. However Islam *et al* and Mustafa *et al* have conclusions similar to our observation[11,12]. On the other hand Johnson *et al* have reported forceps delivery to be more associated with prolonged second stage of labour[10]. The results from different parts of globe have shown variability in terms of association between indications of instrumental delivery and method of instrumental vaginal delivery.

We feel that the study is not biased by selection of subjects for forceps or ventouse to the indication of instrumental intervention. We do not report any effect of parity on selection of instrumental delivery method. One local study has shown ventouse to be more linked with nulliparity, while multiparous were more likely to be delivered by ventouse[7]. However most studies, like our's have not shown this to be the case[10].

There are few limitations to our study. Firstly the possibility of having a type-II error due to smaller sample size was there, which was discussed with the statistician who recommended this to be significant sample for results interpretation. Secondly, a study addressing the neonatal and maternal outcomes in both varieties of instrumental deliveries be carried out to build a consensus on which modality to be used in routine in our set up.

This study has enormous clinical implications. If forceps delivery ends up in better neonatal outcome then this may become obstetrician's choice while selecting an instrumental procedure for assisted vaginal delivery.

CONCLUSION

Outlet forceps assisted vaginal deliveries had better neonatal outcome in terms of Apgar score in comparison to ventouse.

REFERENCES

1. Martin JA, Hamilton BE, Sutton PD, Ventura SJ, Menacker F, Munson ML. Births: final data for 2002.Natl Vital Stat Rep 2003; 52(10):1-113
2. Demissie K, Rhoads GG, Smulian JC, Balasubramanian BA, Gandhi K, Joseph KS, et al. Operative vaginal delivery and neonatal and infant adverse outcomes: population based retrospective analysis. BMJ 2004; 329(7456):24-9.
3. Caughey AB, Sandberg PL, Zlatnik MG, Thiet MP, Parer JT, Laros RK Jr. Forceps compared with vacuum: rates of neonatal and maternal morbidity. Obstet Gynecol 2005; 106:908-12.
4. Olszewski J, Olszewska H, Królikowska B, Preis K. The analysis of complications in forceps delivery in Institutute of Obsterics and Women Disease Medical University of Gdańsk. Ginekol Pol 2006; 77(9):700-4.
5. Melamed N, Yogev Y, Stainmetz S, Ben-Haroush A. What happens when vacuum extraction fails? Arch Gynecol Obstet 2009;280(2):243-8.
6. Hook CD, Damos JR Vacuum-assisted vaginal delivery. Am Fam Physician 2008 ;78(8):953-60.
7. Akhtar S. Comparison of maternal and infant outcome between vacuum extraction and forceps deliveries. Pak Armed Forces Med J 2006; 56(1):12-15.
8. Shihadeh A, Al-Najdawi W. Forceps or vacuum extraction: a comparison of maternal and neonatal morbidity. East Mediterr Health J 2001; 7(1-2):106-14.
9. Mesleh AR, Al-Sawadi MH, Kurdi MA. Comparison of maternal and infant outcomes between vacuum extraction and forceps deliveries. Saudi Med J 2002; 23 (7):811-3.
10. Johnson JH, Figueroa R, Garry D, Elimian A, Maulik D. Immediate maternal and neonatal effects of forceps and vacuum - assisted deliveries. Obstet Gynecol 2004; 103:513-8
11. Mustafa R, Mustafa R. Perinatal and maternal outcome in ventouse versus forceps delivery. JCPSP 2002; 12(6):345-7.
12. Islam A, Murtaza NJ, Khan HA. Vacuum extraction and forceps deliveries: comparison of maternal and neonatal complications. Professional Med J 2008; 15(1):87-90.
13. Office of Surveillance and Biometrics. FDA public health advisory: need for caution when using vacuum assisted delivery devices. Rockville, MD: Food and Drug Administration, 1998.
14. Johanson RB. Vacuum extraction vs. forceps delivery. Oxford, England: The Cochrane Library: pregnancy and childbirth database, 2000, Disk Issue I.
15. Posen R, Chan PT, deLemos RA. Subgaleal hemorrhage in a premature infant with congenital diaphragmatic hernia following vacuum-assisted delivery. J Matern Fetal Med 1998; 7(3):132-6.
16. Salamalekis E, Vitoratos N, Kassanos D, Loghis C, Hintipas E, Salloum I, Creatsas G. The influence of vacuum extractor on fetal oxygenation and newborn status. Arch Gynecol Obstet 2005; 271(2):119-22.
17. Wen SW, Liu S, Kramer MS, Marcoux S, Ohlsson A, Sauve R, et al . Comparison of maternal and infant outcomes between vacuum extraction and forceps delivers. Am J Epidemiol 2001; 15(1):87-90.