FREQUENCY OF SECOND STAGE INTERVENTION AND ITS OUTCOME IN RELATION WITH INSTRUMENTAL VAGINAL DELIVERY VERSUS CAESAREAN SECTION

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Background: To determine the frequency of second stage intervention and the risk of maternal and foetal morbidity and mortality associated with instrumental vaginal deliveries versus caesarean section in our tertiary care set up. **Methods:** This descriptive study was conducted in the Department of Obstetrics and Gynaecology (Unit-II) Liaquat University Hospital Hyderabad Sindh, Pakistan from January 2005 to December 2006. All the women who underwent instrumental vaginal delivery and caesarean section due to prolonged second stage of labour were included in this study. Data were collected on a pre-designed proforma, which included demographic details, maternal and perinatal morbidity as well as any complications etc. Finally, data were analysed through software program SPSS 10.0. **Results:** Frequency of second stage intervention was 22.2%. Among, 400 women who undergone second stage intervention, 240 (60%) were delivered by caesarean section and 160 (40%) were delivered with the help of instruments. Majority of women, i.e., 49.25% were between 21–30 years of age, 73% were un-booked cases while 45% cases were primigravida. Complications with abdominal delivery were paralytic ileus in 35 (14.58%) cases, post partum haemorrhage in 30 (12.5%) cases and tear extension in 13 cases. Complications with instrumental delivery were vaginal tear in 28 (17.5%) cases, cervical tear in 12 (7.5%) and third degree perineal tear in 4 (2.5%) cases. The perinatal outcome with abdominal delivery (86.66%) was better as compared to instrumental delivery (72.5%). **Conclusion:** The frequency of second stage intervention seems high in our set up and is associated with significant maternal and perinatal morbidity. Maternal morbidity was more frequent abdominal delivery while neonatal morbidity and mortality was more frequent with instrumental delivery.

Key words: Second stage intervention, Complication, Outcome.

INTRODUCTION

Second stage interventions are the methods to facilitate delivery of the foetus in the form of assisted vaginal delivery or by instrumental delivery. World-wide, 10-20% of deliveries require some form of intervention, and this intervention is frequently caesarean section.[1] Instrumental vaginal deliveries (forceps and vacuum extraction) account for 7–11% of deliveries.[2,3] Even wider variations in the incidence of instrumental delivery have been reported from European Hospitals.[4] Obstetric history of assisted vaginal delivery started with the invention of instruments designed to deliver women in obstructed labour. The Chamberlain family invented the modern obstetrics forceps; 400 years ago, which became able to deliver baby alive for the first time.[5] Meanwhile James Simpson, Professor of Midwifery from Edinburgh has been credited with inventing the first vacuum extractor in the 1840.[2]

It is only in the last 20 years of different intervening methods, scientific evaluation of risks and benefits are discussed.[5] In the past, the ability to perform difficult vaginal delivery was an essential part of obstetric practice. In current practice, skill of good obstetrician is the ability to avoid difficult vaginal delivery however obstetrician should be experienced in methods of interventions, i.e., safe for mother and the baby. In the cases, where vaginal deliveries are difficult or not possible, technique of caesarean section was introduced by Frances Rousset on living women in the Sixteenth century.[3] This method of delivery initially carried high maternal morbidity and mortality but now with the use of aseptic techniques and availability of antibiotics, it has become comparatively safe for mother and baby.

Follow up of large cohorts of women has clearly demonstrated that the optimal mode of delivery is a spontaneous vaginal birth, with both caesarean section and instrumental delivery but there are chances of residual morbidity at 1st year.[6] The outcome of operative delivery by either vaginal or abdominal route is based on operator's skills, proper training and clear indications for active interventions. Various techniques may help to achieve low assisted delivery rates[7] like avoidance of unnecessary induction of labour, companionship in Labour, active management in the second stage with oxytocin and upright posture in the second stage .[8]

In Royal College of Obstetricians and Gynaecologists (RCOG) consultants conference, operative vaginal delivery rate of 10.5% was reported (range 4–20%) while the consensus emphasizes to lower it to average of 8.5% (ranges 5–15%).[9] In our set up, the majority of women deliver at home by unskilled traditional birth attendants or midwives. Remaining women are delivered in the healthcare set ups under supervision of doctors or consultant

obstetricians or they are referred to major hospitals like ours in prolonged or obstructed labour in moribund condition because of various risk factors.

This study was carried out to determine the frequency of second stage intervention, the risk factors associated with second stage intervention and to compare the associated maternal and neonatal morbidity and mortality with instrumental vaginal deliveries versus caesarean section. This information is helpful to guide obstetricians towards the safest route of delivery in our set up as well as other similar areas in Pakistan and other developing countries.

MATERIAL AND METHODS

This study was carried out at Department of Obstetrics and Gynaecology (Unit-II) of Liaquat University Hospital Hyderabad Sindh, Pakistan from January 2005 to December 2006. Inclusion criteria for the study were all women having prolonged second stage with term, singleton pregnancy and foetus in vertex position. Women were not included in the study who had other indications for intervention like foetal distress, abruptio placentae and medical problems. Women with prolonged second stage in whom the foetal presenting part was engaged and at or below ischial spine with no signs of obstruction were selected for assisted vaginal delivery while those cases where head was above the ischial spines with full cervical dilatation and prolonged labour or those having signs of obstruction or pelvis was inadequate for vaginal delivery underwent caesarean section. All caesarean section and instrumental vaginal deliveries were conducted by senior resident doctor on duty. The data were collected on the proforma with variables like parity, booking status, operative, post operative complications, foetal morbidity and mortality with both procedures. The results were analyzed through SPSS version 10.0.

RESULTS

During the study period, total 1802 women delivered and the second stage intervention was carried out in 400 women. Hence, frequency of second stage intervention was 22.2%. Among these 400 women, 240 (60%) were abdominally delivered while 160 (40%) delivered with the help of instruments (Table-1). Most of the women, i.e., 197 (49.25%) who needed second stage intervention were between 21–30 years of age.. Primigravid women were 180 (45%) and Para 5 and above were 105 (26.25%). Both needed more frequent second stage intervention. Most of the women were un-booked, i.e., 292 (73%) cases, who needed second stage intervention. The maternal morbidity with abdominal delivery was in the form of paralytic ileus; 35 (14.58%) cases, postpartum haemorrhage 30 (12.5%), wound infection 20 (8.33%) cases, tear extension 13 (5.41%) and anaesthesia related complication in 5 (2.08%) cases. Maternal morbidity with instrumental delivery was vaginal Tear in 28 (17.5%) cases, cervical Tear 12 (7.5%) and third degree perineal tear in 4 (2.5%) cases (Table-2). Regarding perinatal outcome, there were 208 (86.66%) alive babies, 5.8% stillbirths and 18 (7.5%) early neonatal deaths among women who delivered abdominally. With instrumental delivery, perinatal outcomes were 116 (72.5%) alive babies, 21 (13.12%) stillbirths and 23 (14.37%) early neonatal deaths. (Table-3) This shows that early neonatal death and still birth rate were high with instrumental delivery. While early neonatal death rate was high with forceps, i.e., 15 (15.6%) and still birth rate was high with vacuum 12 (18.75%).

Table-1: Socio-demographic profile of women with second stage intervention (n=400)

Variable	No. of Cases	Type of Intervention		%
		Abdominal delivery	Instrumental delivery	
Age				
Under 20 years	53	28	25	13.25
21–30 years	197	126	71	49.25
31–40 years	107	64	43	26.75
>40 years	43	22	21	10.75
Parity				
Primigravida	180	105	75	45
Para 1	69	20	49	17.25
Para 2 – 4	46	30	16	11.5
Para 5 and above	105	85	20	26.25
Booking Status				
Booked	108	41	67	27
Un-booked	292	199	93	73

Table-2: Maternal complications in relation to intervention

Type of Intervention	Complication	No. of Cases	%
Abdominal Delivery (n = 240)	Paralytic Ileus	35	14.58
	Postpartum haemorrhage	30	12.5
	Wound Infection	20	8.33
	Tear extension	13	5.41
	Anaesthesia complications	05	2.08
Instrumental Delivery (n = 160)	Vaginal Tear	28	17.5
	Cervical Tear	12	7.5
	Third Degree perineal tear	04	2.5

Table-3: Perinatal Outcome

Mode of Delivery	No. of Cases	Perinatal outcome		
		Alive	Foetal outcome Still Birth	Early Neonatal Death
Abdominal Delivery	240	208 (86.66%)	14 (5.8%)	18 (7.5%)
Instrumental Delivery	160	116 (72.5%)	21 (13.12%)	23 (14.37%)
Forceps	96	72 (75%)	9 (9.37%)	15 (15.6%)
Vacuum	64	44 (68.75%)	12 (18.75%)	8 (12.5%)

DISCUSSION

The second stage interventions are associated with increased maternal and neonatal morbidity and

mortality. The rates at which obstetricians intervene vary enormously as 1.5% in Czech Republic, or as frequently as 15% in Australia and Canada.[10] Even within countries there are marked differences in rate of intervention. In this study, the frequency of intervention was very high, i.e., 22.2%. This marked difference could be attributed to many reasons as our hospital is a major referral hospital and majority of patients 292 (73%) were un-booked and were referred from different hospitals after getting failed trial of labour or being mismanaged in labour. The increased rate of caesarean section has also been found in Nova Scolia, Canada between 1988 to 2000 which ranges from 13.4% to 17.5%.[10] In our study, the rise in caesarean section rate was mainly due to maternal characteristics and concerns related to foetal and maternal safety. The frequency of second stage intervention in the form of instrumental vaginal delivery and caesarean section was found high in primigravidas which could be due to high rate of mismanagement and Cephalopelvic disproportion, rigid perineum, and lack of experience of previous labour in this group of women. Same was found in Feinstein, *et al*[11] study who found nulliparity as a risk factor in second stage arrest and Al-Kadri H, *et al,*[12] who found nulliparous women having more chances of failed instrumental delivery. The maternal morbidity is more frequent and likely to be more severe following a caesarean section than vaginal delivery; for example, nearly 3% of women suffer serious complications including uterine rupture, placenta accreta, placenta previa, and haemorrhage.[13,15] In this study, the maternal morbidity was in the form of post partum haemorrhage (12.5%) and extension of tears (5.41%) etc. The commonest reason for haemorrhage during caesarean section is extension of uterine incision during delivery of foetal head in advanced labour when lower segment is thin and foetal head is deeply engaged, other reason is uterine atony due to prolonged labour Gil Strep, *et al*[16] also reported haemorrhage and need for blood transfusion more common with caesarean section than with operative vaginal deliveries. The anaesthetic complications were in 5 (2.08%) cases, because women were unprepared, anaemic and with electrolyte imbalance. Post-operative morbidity was also high in caesarean section group as 14.58% women had paralytic ileus and 8.3% had wound infection. The reason could be prolonged labour and manipulations as well as prolonged absent of membranes. Infection rate following caesarean section as compared to forceps delivery was found 6 fold high in Bashore *et al* study.[17] Maternal morbidity in relation with instrumental delivery was in the form of vaginal tear(17.5%) cervical tear (7.5%) and third degree perineal tear in 2.5% cases. Weerasekera DS *et al*[18] have also found that vacuum and forceps delivery are associated equally with cervical tear, perineal tear and post partum haemorrhage. Randomized clinical trials with forceps and vacuum by Fitzpatrick M, *et al*[19] found symptoms of altered faecal continence more common following forceps assisted vaginal delivery and found vacuum as first choice in assisted vaginal delivery. RCOG[20] also supports ventouse as instrument of first choice in vaginal delivery. Choudry R[21] have also reported good outcome with vacuum delivery in their study of 100 cases. In this study, perinatal outcome was found better in caesarean section group as compared to forceps and vacuum delivery. Garretta K, *et al*[22] in their study found no difference in Apgar score of new born delivered by caesarean section in 2nd stage. In our study with caesarean section, still birth rate was 5.8%, while with forceps delivery the rate was 9.3% and with vacuum it was 18.7%. This high foetal mortality could be because of prolonged labour and manipulation by different birth attendants before coming to hospital. The incidence of forceps delivery has been reduced in Nigeria because of high perinatal mortality and Birth asphyxia (6–9%).[23] The better results with abdominal delivery versus instrumental delivery could be because of less manipulation and less stress of labour. In contrast, Gil Strap *et al*[24] in their survey found no significant difference in instrumental delivery and caesarean section group. Similarly, Wesley[25] has found no any long term sequel in the form of IQ in abdominal and instrumental vaginal delivery. This vast difference could be because of regular antenatal care, proper intranatal monitoring facilities and intensive neonatal services in their setup. Murphy DG, *et al*[26] assessed the operative delivery in the second stage of labour in relation to foetal morbidity, and found it more with the use of more than one instrument, more manipulation and also operative experience. Observational data on instrumental deliveries have suggested that they are associated with neonatal injuries so careful practice can minimize these risks and the aim should be to reduce un-necessary interventions.

CONCLUSION

The second stage interventions in our set up seem high and are associated with increased maternal and foetal morbidity. The common risk factors found were un-booked status, Primigravidas, mismanaged labour by inexperienced personnel and late referral. The rate of complications could have been avoided by improvement of antenatal care, assessment in early labour by experienced obstetricians and timely intervention. Although, both the procedures

carried complications but the maternal morbidity was more frequent in abdominal delivery and neonatal morbidity and mortality was observed more in instrumental delivery.

However, findings of this study shall be interpreted with caution as it has limitations of stronger statistical analysis and a smaller sample size.

REFERENCES

1. Hibbard BM. Forceps delivery. In: Turnbull A, Chamberlain G (eds) Obstetrics London: Churchill Livingstone; 1989. p 833–4.
2. Bird GC. Modification of Malmstrom's vacuum extractor. BMJ 1969;3:526.
3. Johonson RB, Rice C, Doyle M, Arthur J, Anyanwul, Ibrahim J, *et al.* A randomized prospective study comparing the new vacuum extractor policy with forceps delivery. Br J Obstet Gynaecol. 1993;100:524–30.
4. Alran S, Sibony O, Oury JF, Luton D, Blot P Differences in management and results in term-delivery in nine European referral hospitals: descriptive study. Eur J Obstet Gynaecol Report Biol. 2002;103: 4–13.
5. Khalil A Pat O' Brien 'Operative vaginal delivery' In stud J (ed) Progress in Obstetrics and Gynaecology John Studd 2005. p 127–32.
6. Glazener CMA, Abdalla M, Stroud P, Naji S, Templeton A, Russell IT. Postnatal maternal morbidity: extent, causes, prevention and treatment.. Br J Obstet Gynaecol 1995;102:286–7.
7. Enkin M, Keirse MJNC, Renfrew MJ, Neilson JP. Guide to effective care in pregnancy and childbirth; 2nd ed. Oxford: Oxford University Press. 1995.
8. de Jong PR, Johanson RB, Baxen P, Adrians VD, van der Westhuisen S, Jones PW. Randomised trial comparing the upright and supine positions for the second stage of labour. Br J Obstet Gynaecol 1997;104:567–71.
9. Johanson R. Advances in assisted vaginal delivery with vacuum extractor. In: Bonnar J (Ed). Recent advances in obstetrics and gynaecology. Edinburgh: Churchill Livingstone; 1998. p 125–39.
10. Stephenson PA. International differences in the use of obstetrical interventions. Copenhagen: World Health Organization 1992 WHO EUR/ICP of MCH 112.
11. Feinstein U, Sheiner E, Levy A, Hallak M, Mazor M. Risk factor for arrest of descent during the second stage of labour. Int J Gynaecol Obstet. 2002;77(1):7–14.
12. Al-Kadri H, Sabr Y, Al-Saif S, Abulaimoun B, Ba'Aqeel H, Saleh A. Failed individual and sequential instrumental vaginal delivery: contributing risk factors and maternal neonatal complications. Acta Obstet Gynaecol Scand. 2003;82(7):642–8.
13. Cowan RK, Kinch RA, Ellis B, Anderson R. Trial of labour following caesarean delivery. Obstet Gynaecol. 1994;83:933–6.
14. Rosen MG, Dickinson JC, Westhoff CL. Vaginal birth after caesarean: a meta analysis of Morbidity and Mortality. Obstet Gynaecol. 1991;77:465–70.
15. Videla FL, Satin AJ, Barth WH Jr, Hankins GD.. Trial of labor: a disciplined approach to labor management resulting in a high rate of vaginal delivery. Am J Perinatol. 1995;12:181–4.
16. Gilstrap LC 3rd, Hauth JC, Hankins GDV, Patterson AR. Effect of type of anaesthesia on blood loss at caesarean section. Obstet Gynaecol. 1987;69(3 Pt 1):328–32.
17. Bashore RA, Phillips WH Jr, Brinkman CR 3rd. A comparison of the morbidity of midforceps and caesarean delivery. Am J Obstet Gynaecol. 1990;162:1428–34.
18. Weerasekera DS, Premaratne S. A randomised prospective trial of the obstetric forceps versus vacuum extraction using defined criteria. J Obstet Gynaecol. 2002;22(4):344–5.
19. Fitzpatrick M, Behan M, O'Connell PR, O'Herlihy C. Randomised clinical trial to assess anal sphincter. Function following forceps or vacuum assisted vaginal delivery. BJOG. 2003;110:424–9.
20. Dietz HP, Bennett MJ. The effect of childbirth on pelvic organ mobility. Obstet Gynaecol 2003;102(2):223–8.
21. Chaudri R, Syed S. Ventouse delivery: maternal and foetal outcome. J Rawal Med Coll. 2002;6(2):60–4.
22. Garrett K, Butler A, Cohen WR. Caesarean delivery during second-stage labor: characteristics and diagnostic accuracy. J Matern Fetal Neonatal Med. 2005;17(1):49–53.
23. Aimakhu CO, Olavemi O, Enabor OO, Oluyemi FA, Aimakhu VE. Forceps delivery at the University College Hospital, Ibadan, Nigeria., West Afr J Med 2003;22:222–4.
24. Gilstrap LC 3rd, Hauth JC, Schiano S, Connor KD. Neontal acidosis and method of delivery. Obstet Gynaecol 1984;63(5):681–5.
25. Wesley BD, Van Den Berg BJ, Reece EA. The effect of forceps delivery on cognitive development. Am J Obstet Gynecol 1993;169:1091.
26. Murphy DJ, Liebling RE, Patel R, Verity L, Swingler R. Cohort study of operative delivery in the second stage of labour and standard of obstetric care. BJOG 2003;110(6):610–5.

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