The management of persistent occipito-posterior position

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Summary: Persistent occipito-posterior position (POP) is found in about 1% of labors, and its management is still controversial. A study group of 319 patients with POP deliveries were screened and analyzed for prepartum, intrapartum and postpartum parameters. A control group of the same size was matched for maternal age (mean 27-28±5.22 yrs), gravidit (mean 2.52±1.95) and parity (mean 1.13±1.67). Statistically significant differences were found between the study and the control groups regarding the incidence of instrumental (forceps/vacuum) deliveries, prolonged second stage, pregnancy-induced hypertension, prostaglandin E2 induction, premature rupture of membranes and episiotomy. A discussion is presented evaluating the possible significance of these findings. Although the high rate of instrumental deliveries encourages active management of POP labors, the authors advocate a more conservative approach.

Key words: Occipito-posterior; Delivery;

INTRODUCTION

The fetal occiput is located posteriorly in about 25% of patients in the early stage of labor and in 10-15% in the active phase ([1]). Rotation of the fetal head to the occipito-anterior position tends to occur prior to delivery, but in 5% to 10% of patients the occipito-posterior position persists ([2, 3]). Hence, the actual incidence of persistent occipito-posterior position (POP) at delivery is approximately 1% to 2%. The exact mechanisms responsible for failure of rotation of the fetal head are not known, but the posterior position is often met with android or anthropoid pelvis, in which transverse narrowing of the mid-pelvis may play a part ([3]).

The management of POP ranges from extreme conservatism to a variety of maneuvers involving both manual rotation and rotation with different types of forceps ([4–15]).

The significance of POP with regard to maternal, fetal or neonatal morbidity and mortality is still controversial. Some authors claim that this position is neither anomalous nor ominous ([11]), whereas others regard POP as an obstetrical complication of the first magnitude ([12, 16, 17]).

Received 27-7-1994 from the
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Revised manuscript accepted for publication 29-10-1994.

Using Medline data we were unable to find any publication in the literature during the last two decades dealing with this condition. It is of interest to examine the issue of POP in our era of modern obstetrics to see whether its management during labor has changed.

MATERIALS AND METHODS

The retrospective data presented here were taken from our delivery room records from January 1, 1983 to June 30, 1993.

During this period 32,811 deliveries took place; of these, 319 (0.97%) were POP. POP was defined as such only when it was confirmed by digital examination during the second stage of labor and the fetus was actually delivered in the POP position.

The control group consisted of 319 non-POP patients who gave birth during the same period, and were matched with the POP study group for maternal age, gravidity, parity, gestational age at birth and birthweight of neonate. They were also selected from our delivery room records. Each participant in the control group was the next women to give birth who met the above mentioned criteria for a given POP delivery as noted in our delivery room records. Deviations of up to one for each of these criteria were allowed for each case. The specifications of each such delivery were used as a data source for comparison with the study group. We included deliveries by cesarean section, but excluded women from the control group if they had been operated on before the second stage of labor, as we focussed on that stage in the delivery process for our definition of POP.

The groups were compared for selected parameters, as follows:

I) *Prepartum parameters:* Previous cesarean section, maternal gestational diabetes, maternal pregnancy-induced hypertension, prostaglandin E2 induction, and premature rupture of membranes.

II) *Intrapartu mparameters:* Spontaneous rupture of membranes, spontaneous delivery, outlet forceps delivery, vacuum extraction, prolonged second stage, episiotomy, perineal tears, cesarean section, meconium staining, fetal distress, and cephalo-pelvic disproportion.

III) *Postpartum parameters:* Nuchal cord, sex of the neonate, and Apgar scores at 1 and 5 minutes.

Fetal heart rate monitoring was routinely used for all labors. Premature rupture of the membranes was defined as the breakage of the fetal membranes prior to the onset of labor contractions. All episiotomies performed were of the mediolateral type.

The analgesics used in almost all the screened labors were intravenous pethidine 75 mg/ promethasine 25 mg drip or epidural block, with approximately the same number of cases for each. Since no statistically significant difference was found for the different analgesics with regard to the parameters considered in this study, patients were not differentiated on this basis.

Fetal distress was defined as fetal heart rate with late or variable decelerations or baseline bradycardia, sometimes associated with meconium-stained amniotic fluid.

Neither forceps nor manual rotation was performed. Vacuum extraction was used in cases of +1 or +2 station and complete rotation of the fetal head accompanied by an adequate pelvis.

The use of forceps was limited to outlet forceps delivery, and no cases of failed forceps/ vacuum delivery were recorded.

This was true regarding both POP and other types of deliveries, since this is our departmental policy regarding instrumental deliveries, irrespective of the indication for their use.

One minute and five minute Apgar scores of ≤ 7 were recorded in all instrumental deliveries and cesarean sections in both the study and control groups.

The distribution of the selected parameters between the study and the control groups was analyzed statistically using the chi-square test or Fischer's exact test was used if small numbers were involved. Pearson's correlation coefficients and its significance were calculated between parameters in each group. P values less than or equal to 0.05 were considered statistically significant.

RESULTS

I) Demographic data (*Table* 1): Most of the patients were 20-40 years of age; only 7 (2%) were under 20, and 3 (0.9%) over 40. One-hundred and twenty-eight patients (40%) were primiparas, while the highest gravidity was gravida 13, para 10. Birthweigtht in the study group ranged mainly between 2500 and 4000 grams; 5 newborns (1.5%) weighed over 4000 gm, while only 2 (0.6%) were under 2500 gm. The birthweight of the

Table 1. – *Demographic data.*

Parameter	Group	mean	S.D.*	Min.	Max.
Maternal age (yrs)	Study	27.97	5.22	16	41
	Control	27.97	5.22	16	41
Gravidity	Study	2.52	1.95	1	11
	Control	2.52	1.97	1	13
Parity	Study	1.13	1.67	0	10
	Control	1.13	1.67	0	10
Gestational week	Study	39.46	1.61	26	42
	Control	39.63	1.56	35	42
Birthweight (gms)	Study	3359	489	780	4800
	Control	3340	271	2710	4100

control group average 3340±271 gm and was similar to that in the study group. This was also true with respect to gestational age at birth (39.46±0.61 and 39.63±1.56 weeks in the study and concontrol groups, respectively).

II) Prepartum parameters (*Table* 2): Significant differences were found between the study and control groups in premature rupture hypertension (5 vs. 14, p = 0.04)) and prostaglandin E2 induction (14 vs. 27, p=0.04). There was no correlation between pregnancy-induced hypertension and cesarean section in either the study or control groups; therefore, the lesser risk of a POP patient having concomitant pregnancy-induced hypertension could not be related to the higher rate of cesarean section in such cases, which would prevent patients from reaching a POP state during vaginal delivery. Differences between these groups regarding previous cesarean section, twin deliveries, and maternal gestational diabetes mellitus were not statistically significant.

III) Intrapartum parameters (*Table* 3): There were more statistically significant spontaneous deliveries among the control group than among the study group (272 vs. 176, p<0.0001). The rate of episiotomy in the study group was significantly higher than in the controls (229 vs. 171, p<0.0001), but the incidence of perineal tears was similar (28 vs 25, p = 0.67).

The rate of cesarean section in the study group was 7.84% (25 cases), and the leading causes for the operation were pre-

Table 2. – *Prepartum parameters.*

Parameters	Study group		Control group		p*
	Number	%	Number	%	
Status post cesarean section	12	3.76	5	1.57	0.09
Maternal gestational diabetes mellitus	6	1.88	12	3.76	0.15
Premature rupture of membranes	6	1.88	17	5.33	0.02
Pregnancy-induced hypertension	5	1.57	14	4.39	0.04
Prostaglandin E2 induction	14	4.39	27	8.46	0.04

(*) P values were calculated by chi-square test.

Table 3. – *Intrapartum parameters.*

Parameters	Study group		Control group		p*
	Number	%	Number	%	
Spontaneous rupture of membranes	71	22.26	91	28.53	0.07
Episiotomy	229	71.79	171	53.61	0.0001
Spontaneous delivery	176	55.17	272	85.27	0.0001
Outlet forceps delivery	91	28.53	13	4.08	0.0001
Vacuum extraction	22	6.90	8	2.51	0.009
Prolonged second stage	52	16.30	13	4.08	0.0001
Perineal tear	28	8.77	25	7.84	0.67
Cesarea section	25	7.84	23	7.21	0.76
Meconium	30	9.40	28	8.78	0.78
Fetal distress	20	6.27	11	3.45	0.10
Cephalo-pelvic disproportion	15	4.70	9	2.82	0.21

(*) P values were calculater by chi-square test.

vious cesarean section ($p=0.0001$, $r=0.248$), premature rupture of the membranes ($p=0.02$, $r=0.13$) and cephalo-pelvic disproportion ($p=0.0001$, $r=0.43$). Cesarean section was not directly related to the position of the fetal head, since the incidence of the operation in the two groups did not differ significantly ($p=0.76$).

The second stage was significantly prolonged in the study group compared to the control group (52 vs. 13, $p<0.0001$), and a significantly greater role of instrumental delivery was found in the study group (outlet forceps delivery - 91 vs. 13, $p<0.0001$; vacuum extraction - 22 vs. 8, $p=0.009$). There was a statistically significant correlation between prolonged second stage and vacuum extraction ($r=0.15$, $p=0.008$), but not between prolonged second stage and outlet forceps delivery ($r=0.04$, $p=0.47$).

There was no statistically significant difference in the incidence of fetal distress, cephalo-pelvic disproportion or presence of meconium between the study group and the controls.

Fetal distress was assumed in 20 study group patients and 11 controls ($p=0.1$). The correlation between the presence of meconium and the clinical diagnosis of fetal distress was statistically significant ($r=0.18$, $p=0.001$), in contrast to the presence of fetal distress with cephalo-pelvic disproportion or prolonged second stage, which were found to be unrelated. No correlation was found between prolonged second stage and meconium staining, fetal distress, cephalo-pelvic disproportion or birthweight.

IV) Postpartum parameters (*Table* 4): There was no statistically significant difference in the sex distribution of the newborns in the study or control groups ($p=0.53$). Post-partum complications, such as nuchal cord, did not differ significantly between the POP patients and the controls (16 vs. 24, $p=0.19$).

Table 4. – *Postpartum parameters.*

Parameters	Study group		Control group		p
	Number	%	Number	%	
Apgar 1' (0-7)	28	8.71	16	5.0	0.06*
Apgar 5' (1-7)	4	1.25	0	0	0.12**
Nuchal cord	16	5.02	24	7.52	0.19*
Sex (male)	174	54.55	145	52.04	0.53*
Sex (female)	166	45.45	153	47.96	

(*) P values were calculated from chi-square test.

(**) P value was calculated from Fisher's exact test.

One minute and five minute Apgar scores were not significantly different between the groups (28 vs. 16, $p=0.06$, and 4 vs. 0, $p=0.12$, respectively), although the difference for the one-minute Apgar score was quite noticeable.

The correlation analysis of outlet forceps delivery and Apgar scores was statistically significant: $r=0.11$; $p=0.004$ for Apgar score at one minute and $r=-0.11$; $p=0.03$ for Apgar score at five minutes. No such correlation was found between the Apgar score and vacuum extraction.

DISCUSSION

The controversy on the management of POP initially erupted when William Smellie ([4]) performed the first reported instrumental rotation of a POP fetus in 1745. Scanzoni ([5]) revived forceps rotation in 1865, and various modifications of this maneuver have since been developed ([6-9]), indicating the concern of obstetricians regarding this position.

The generally held opinion during the early part of this century on POP management can be summarized with a quote from Jacobs ([8]), in 1936: "to say that the occipito-posterior, because of its frequency and unfavorable effect upon labor,

as well as infant mortality, is the most serious obstetrical complication, is merely to confirm the attitude held by almost all modern writers at this time".

More recently, ideas have changed, and various reports have advocated spontaneous delivery to minimize maternal and fetal risks that were previously thought to be related to POP ([10-12]). In 1974, Phillips and Freeman ([14]), in an excellent article, favored the more conservative approach to the problem. However, in 1981, Rutherford ([15]) presented his experience, stating that despite the more conservative attitude of the time, only 31% of this patients delivered spontaneously.

According to our results, the typical profile of the woman likely to deliver a POP fetus is 28 years old, gravida 2-3, para 1-2, 39th gestational week. There is an equal chance of her being diabetic or after a cesarean section, as women delivering in other positions, and has a lower chance of having pregnancy-induced hypertension. The rate of induction by prostaglanding E2 in POP cases is lower, and so is the incidence of premature rupture of the membranes.

Our results demonstrate that there is no difference in maternal or fetal morbidity and mortality between the POP and non-POP deliveries. POP is not associated with a higher prevalence of cesarean section, which seems to be correlated mainly to cephalo-pelvic disproportion ($r=0.43$, $p=0.0001$). POP is not related to postpartum complications, such as retention of placental fragments ($p=0.26$) or nuchal cord ($p=0.19$). The incidence of episiotomy is significantly higher in this position ($p<0.0001$), and that of premature rupture of the membranes lower ($p=0.02$); the occurrence of perineal tears does not seem to differ from controls.

On the other hand, in agreement with a previous report ([15]), there is a significant prevalence of prolonged second stage and a greater number of instrumental deliveries (vacuum extraction) associated with POP ($p=0.008$). Nevertheless, no higher incidence of fetal distress was registered in the POP position ($p=0.1$), and no correlation was found between prolonged second stage and fetal distress ($p=0.43$) or lower Apgar scores at one minute ($p=0.16$) or at five minutes ($p=0.54$), suggesting that POP per se is unrelated to fetal suffering.

However, forceps delivery, which is commonly associated with this type of labor, is strongly correlated to fetal distress ($r=0.21$, $p=0.0002$), as well as to lower Apgar scores (1 minute, $p=0.1$; 5 minutes, $p=0.06$). This correlation does not exist with regard to vacuum extraction delivery, leading to the conclusion that the type of assistance provided in these cases is highly significant in terms of fetal outcome.

We registered a correlation between prolonged second state and vacuum extraction ($r=0.15$; $p=0.08$). This is consistent with our policy of performing vacuum extraction in cases of prolonged second stage with station $+1$ or $+2$ and incomplete rotation of the fetal head, provided there is an adequate pelvis which allows the passage of the fetal head. This type of management does not increase fetal distress, as mentioned above, and is therefore the method of choice during prolonged second stage. On the other hand, no correlation was found between prolonged second stage and forceps deliveries ($r=0.04$; $p=0.47$), although forceps deliveries were strongly correlated to fetal distress and lower Apgar scores. Since we apply only low-outlet forceps, the fetal suffering associated with this conditions is most probably the consequence of prolonged pressure of the pelvic floor on the fetal head, and not a result of the instrument itself.

In conclusion, our data support the conservative approach in such conditions.

The key point for this policy is continuous fetal heart rate monitoring, which enable the attending obstetrician to wait calmy and to choose the proper moment and optimal method of delivery for both mother and fetus, and to avoid if possible, the complicated and dangerous forceps rotation maneuvers. The widespread use of fetal heart rate and fetal scalp pH monitoring developed in the 70s ([18]) support this wait-and-see approach. However, it should be remembered that the present work concentrated on the events before and during POP delivery and not on the long-term effects of such labor on the newborn. To further elucidate the controversy on this issue, long-term follow-up studies should be encouraged.

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