232 Journal of Obstetrics and Gynaecology (1986) 6, 232–235 *Printed in Great Britain*

The birthing chair: an obstetric hazard?

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Summary
In a random, controlled trial, mothers were allocated to either the bed or the birthing chair for the second stage of labour. Of 288 primiparae and 348 multiparae, mothers delivered on the chair were more likely to have a postpartum haemorrhage, more likely to have a perineal tear and less likely to have an intact perineum. No evidence was found that the use of the chair was beneficial.

At a time of change in the attitude of the consumer towards obstetric practice the traditional positions advocated for mothers in labour have been challenged (Atwood, 1976). Dunn (1976) suggested that an upright position in labour is preferable to supine or recumbent. The upright position avoids caval compression and supine hypotension and may improve fetal oxygenation; the use of gravity may shorten the second stage of labour.

The upright position in labour using a birthing chair is nothing new. Descriptions may be found as long ago as 2500 B.C. in ancient Egypt and, later, Hippocrates (460–337 B.C.) recommended its use (Atwood, 1976). Recently, the birthing chair has been enthusiastically reintroduced (Haukeland, 1981; Hemminki *et al.*, 1986).

At Northwick Park Hospital, we were attracted by the theoretical advantages of the birthing chair and in 1981 introduced the American-made Birth EZ Chair to our unit. This proved popular with some of our mothers and after a period of adjustment, the midwives were happy to offer the birthing chair to any mother requesting it. After the introduction period, an uncontrolled pilot study of self-selected patients appeared to demonstrate that the chair benefited mothers in labour (Romney, 1985).

The introduction of new therapeutic practices in obstetrics and gynaecology without evaluation by properly conducted clinical trials has been criticised (Cochrane, 1979; Bryce and Enkin, 1985). We decided to subject the use of the birthing chair to a random, controlled trial in case its benefits became, like predelivery shaving (Romney, 1980) and routine enemas (Romney and Gordon, 1981), another established myth.

PATIENTS AND METHODS

The study was confined to mothers in the second stage of labour with a single live fetus, a maturity greater than 36 weeks and a cephalic presentation. Mothers who expressed a strong preference antenatally for delivery in either the chair or the bed were excluded from the study. There were 348 multiparae and 288 primiparae, all from one consultant (H.G.). Mothers were allocated at random to the standard delivery bed or the birthing chair by opening a sealed envelope before the onset of the second stage. On the bed, delivery was conducted in the dorsal position but patients could be propped up by a pillow for comfort.

The Birth EZ Chair is made of high-impact plastic with moulded leg supports and foot-rests. The height and angle of the chair are hydraulically controlled. Delivery was conducted with the chair tilted back to an angle of 40°. This position was found by previous experience to be the most comfortable for the mother and allowed good access for the midwife conducting the delivery. The chair was maintained in this position to facilitate delivery of the placenta and repair of the perineum.

Mothers requiring induction of labour had a prostaglandin E_2 pessary (3 mg) inserted unless there were clinical contraindications. Amniotomy was performed as soon as the patient was in labour. In labour, primiparae followed a policy of active management (O'Driscoll *et al.*, 1984). Electronic fetal monitoring was employed when indicated and a 24 hour epidural analgesia service was available. The incidences of induction of labour (33·8 per cent) and epidural anaesthesia (26·4 per cent) were similar in the chair and bed groups.

In labour, primiparae were assessed vaginally every 2 hours and multiparae every 4 hours. The incidence of acceleration of labour with oxytocin (18·9 per cent) and the total duration of labour were similar in the chair and bed groups. The few patients

Table I. Comparison between chair and bed deliveries in primiparae (none of the differences was significant)

	Chair	*Bed*
Mothers	111	140
Mean duration of second stage (min)	58	56
Mean duration of pushing (min)	45	43
Average blood loss (ml)	317	280

Table II. Comparison between chair and bed deliveries in multiparae (none of the differences was significant)

	Chair	*Bed*
Mothers	115	173
Mean duration of second stage (min)	20	19
Mean duration of pushing (min)	20	19
Average blood loss (ml)	275	257

who needed caesarean section were of course transferred to an operating table for delivery.

There was no difference between the chair and bed groups with respect to maternal age, social class, birth weight and gestational age.

The second stage of labour was diagnosed only if full cervical dilation was found on vaginal examination or the vertex was visible. Patients allocated to the chair were transferred to it as soon as the second stage was diagnosed. They were not moved before as prolonged sitting in the chair is associated with progressive perineal oedema.

Oxytocin was sometimes used in both groups if there was delay in the second stage but not in parous patients or if there was fetal distress. Indications for forceps delivery were orthodox: if a forceps delivery was needed in a patient in the chair, the procedure was carried out in the chair.

Mothers were allocated at random by the intention to treat but the intended allocation was not always feasible. Although informed consent had been obtained, four primiparae and one multiparous patient changed their minds and insisted on a chair delivery. This group was too small to analyse separately or to affect the overall results. Thirty-three primiparae and 59 multiparae allocated to the chair were delivered in the bed. Forty of these 92 mothers changed their minds and declined the move to the chair. Thirty-two mothers delivered too quickly to be moved to the chair. In 20 mothers, the patient was not moved to the chair on the instruction of the obstetrician because of complications such as fetal distress.

In mothers in whom the intended allocation to the chair was unsuccessful, the incidence of epidural anaesthesia, induction of labour and acceleration of labour was similar to the incidence in mothers in whom the intended allocation to the chair was successful. The mean duration of the labour, mean duration of the second stage, mean duration of pushing and the mode of delivery did not differ when the bed and birthing chair groups were analysed by intention to treat. The incidence of postpartum haemorrhage, perineal tears and intact perineums in patients allocated to the chair but delivered on the bed did not differ from the incidence in patients allocated to the bed.

The statistical methods used were Student's two sample *t* test for Tables I and II, Student's *t* test for Table III and Fisher's exact test for Table IV.

RESULTS

In primiparae (Table I) and multiparae (Table II), there was no difference in the duration of pushing and the duration of the second stage of labour between chair and bed patients.

Table III. Comparison of mode of delivery in the second stage of labour and perineal outcome between chair and bed deliveries. Patients needing caesarean section in the second stage were moved to an operating table

	Primiparae			*Multiparae*		
	Chair	Bed		Chair	Bed	
Mothers	111	140		115	173	
Normal deliveries	87 (78%)	107 (76%)		107 (93%)	164 (95%)	
All forceps	22 (20%)	31 (22%)		6 (5%)	7 (4%)	
Caesarean section	2 (2%)	2 (1%)		2 (2%)	2 (1%)	
Intact perineum	13 (12%)	30 (22%)	($P<0.05$)	26 (23%)	61 (36%)	($P<0.05$)
Perineal tears	39 (36%)	26 (19%)	($P<0.005$)	71 (63%)	81 (47%)	($P<0.025$)
Episiotomy	57 (52%)	82 (59%)		16 (14%)	29 (17%)	

The mode of delivery and the perineal outcome in patients using the birthing chair compared with patients delivering on the bed are given in Table III. In both primiparae and multiparae there was no difference between the two groups by mode of delivery.

Both primiparae and multiparae using the chair were less likely to deliver with an intact perineum ($P<0.05$) and more likely to have a perineal laceration ($P<0.025$). In primiparae, 26 per cent had a second degree tear in the chair and 12 per cent on the bed ($P<0.00005$).

The incidence of postpartum haemorrhage (≥500 ml) following a normal delivery in the chair (Table IV) was increased in primiparae ($P<0.05$) and in multiparae and primiparae combined ($P<0.02$). When patients delivered with forceps in the birthing chair were compared with those delivered with forceps on the bed no difference was found between the two groups in the incidence of postpartum haemorrhage.

Table IV. Postpartum haemorrhage (≥500 ml) following normal deliveries (primiparae—chair 87, bed 107; multiparae—chair 107, bed 164)

	Chair	*Bed*	
Primiparae	9·2%	2·8%	($P<0.05$)
Multiparae	8·4%	4·3%	
All mothers	8·8%	3·7%	($P<0.02$)

Apgar scores were less than 7 at 5 minutes in only one baby delivered in the chair and in only two babies delivered on the bed. There were no perinatal deaths in the study.

DISCUSSION

The introduction of new alternatives in labour should preferably benefit, or at least not harm, the mother or her child. No evidence could be found in this study that the use of the birthing chair in the second stage of labour fulfils these criteria.

No evidence was found that the use of the chair was beneficial. Neither the duration of the second stage nor the time for which the patient pushed in the second stage was shortened in the chair (Tables I and II). The incidence of operative delivery was not reduced (Table III). There was no obvious benefit for the fetus in terms of Apgar scores. This is consistent with an earlier study which failed to demonstrate improved oxygenation using a continuous recording subcutaneous Po_2 electrode in the first stage of labour in mothers using the birthing chair (Aarnoudse *et al*., 1984).

Although the study of Shannahan and Cottrell (1985) was not randomised, retrospective, limited to only 60 primiparae, excluded augmented patients and did not state the mode of delivery, no benefit of using the chair was demonstrated. Similarly, no advantage was shown in a random, controlled trial by Stewart *et al*. (1983) of 189 deliveries. Reports of benefit have usually been anecdotal and uncontrolled (Haukeland, 1981).

In the present study the use of the chair was associated with definite disadvantages, with an increased incidence of perineal tears and of postpartum haemorrhage following normal deliveries.

The increased incidence of postpartum haemorrhage in the chair is disconcerting, particularly in view of the increased number of maternal deaths due to haemorrhage in the most recent Report on Confidential Enquiries into Maternal Deaths (1982).

Stewart *et al*. (1983) also found an increased frequency of postpartum haemorrhage and a higher mean blood loss at delivery in patients delivered on the birthing chair. Shannahan and Cottrell (1985) found that the chair group subsequently had significantly lower mean haemoglobin and haematocrit values ($P<0.025$) and recommended further investigation of maternal blood loss. In the 18th century, an English obstetrician, John Burton, noted that 'if the patient sit on a stool... if the patient be disposed to Flood, this position will increase it' (Atwood, 1976).

On the chair, the episiotomy rate was not reduced but the incidence of perineal tears was increased. Another 18th century English obstetrician, Charles White, warned against delivery in the upright posture because of complications such as 'frequently occasioning laceration of perineum and sphincter ani, ... flooding, after pains, syncopes, faintings and death itself' (Atwood, 1976).

It is important that new obstetric practices are properly evaluated. In uncontrolled studies, the mothers who opt for the latest fashion in labour tend to be mothers in the higher social groups who are well read and highly motivated. These mothers are likely to achieve a good outcome in labour irrespective of the methods adopted. Such bias would explain the good impression of the chair experienced by the midwives and obstetricians in our initial, uncontrolled study (Romney, 1985).

In view of the findings of this study, we suggest that mothers who insist on using the birthing chair should be informed that there is no proved benefit but that there is evidence that they are more likely to have a postpartum haemorrhage and less likely to have an intact perineum.

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Book review

The Captured Womb. A History of the Medical Care of Pregnant Women. Ann Oakley. 226×144 mm. Pp. 352. 1985. Oxford, Basil Blackwell. £17·50. Hardback.

This book provides an accurate and comprehensive review of the history and practice of antenatal care in Great Britain. It is written in a most readable style so that the well-tabulated and illustrated statistics come to life with a forceful reality. Particular emphasis has also been extended to cover the changes in social care and nutrition in the community and their effects on the maternal and perinatal mortality rates.

The coverage of the modern technological approach to fetal monitoring is well explained, although the illustrations feature the earliest and most primitive machines. Little attempt is made to relieve the pessimism of this invasive approach on women by reference to the much more sophisticated technology currently available.

From its emotive title, through its inflammatory Preface, to its final figure in the Appendix, this book maintains a dogmatic and highly critical viewpoint of male-dominated antenatal care. Since this is a historical review, the authoress does not advance her view on how she feels antenatal care could be improved. Although this book is to be considered essential reading for all those who practise antenatal care, it should really carry a government warning that it may damage the health of any staunch old school male obstetrician.

J. Wilde