Basrah Journal of Surgery

Bas J Surg, March, 9, 2003

ACTIVE MANAGEMENT OF LABOUR IN PAROUS WOMEN (FETOMATERNAL EFFECT)

Hayfa Al-Shaheen

M.B.Ch.B, D.G.O., C.A.B.G.O., Department of Obstetrics and Gynaecology, Basrah Maternity and Children Hospital, Basrah; IRAQ.

Summary

This prospective study was carried out during nine months period (first of December 2000 until the end of August 2001) in Basrah Maternity and Children Hospital to evaluate whether oxytocin augmentation would shorten the length of labour, lower cesarean section rate or has any adverse effects on neonatal outcome. Data were collected and analyzed on 506 low risk multiparous (p1-3), at term, in spontanous labour. Two hundred forty nine of them needed oxytocin augmentation while 257 had spontaneous effective uterine contractions. This study confirmed that the mean duration of first stage of labour in oxytocin augmented patients shortened by 1.3 hours (from 5.8 hours in control to 4.5 hours in oxytocin augmented women), p value <0.001. Other finding in our study is that the rates of emergency cesarean section in oxytocin augmented women and controls were 1.6% and 2.7%, respectively. The difference was statistically not significant. The rate of low forceps delivery in oxytocin augmented patients was 0.4% in comparison to 1.2% in control group, the difference was statistically not significant. No case of uterine rupture was recorded. Our study has confirmed that perinatal mortality was 0.4% for both groups. These results provide reassurance about maternal and fetal safety in oxytocin treated group. It is used as part of protocol of active management of labour to correct dystocia when spontaneous multiparous labour with vertex presentation fails to progress.

Introduction

During the past 20 years of obstetric practice in the United States, there has been an alarming increase in the rate of cesarean deliveries. The majority of this increase has been in the number of caesarean performed on mulliparous patients for dystocia and as repeat cesarean in multiparous women. Any intervention aimed at reduce the first indication would, by definition, lead to a reduction in the second. With the assumption that inefficient uterine action is largely responsible for dystocia, augmentation of labour is an appropriate intervention[1].

Dystocia is defined as difficult labour it is characterized by abnormally slow progress of labour[2].

Correspondence to:
Dr. Hayfa Al-Shaheen
Department of Obstetric and Gynaecology,
Basrah Maternity and Children Hospital,
Basrah; IRAQ.

A labour which is unduly prolonged is likely to give rise to one or more of three types of distress, namely maternal, fetal or obstetricians distress[3]. It presents a picture of mental anguish and physical morbidity which often leads to surgical intervention and may produce a permanent revulsion to child birth, expressed by the mother as voluntary infertility; it constitutes as danger to the survival and subsequent neurological development of the infant. Oxytocin administration forms an essential part of programs of active augmentation by improving uterine contractility and preventing prolonged labour[4].

Prospective randomized controlled investigations of the efficacy of active management of labour in the United States demonstrate reduction in the length of labour and a trend toward a reduction in cesarean section rates in patients undergoing active management compared with patients in usual care protocol[5,6].

Problems associated with oxytocin administration are hyperstimulation, water intoxication, neonatal jaundice, fetal hypoxia and trauma (uterine rupture)[7,8].

The aim of the study is to evaluate the efficacy of oxytocin augmentation in multigravda labour in order to clarify whether active management of labour would shorten labour, affect rate of caesarean section and operative vaginal delivery, whether it has any adverse effects on neonatal outcome, and to improve maternal and fetal safety if oxytocin is used as apart of protocol active management[4].

Patients and Methods

This study is a prospective case-control study that was conducted in Basrah Maternity and Children Hospital from the first of December 2000 until the end of August 2001. Over this 9 months period, there were 6061 deliveries including primigravidae and multigravidae.

The patient included in the study are parous women (P1-3), the minimum risk concept, in spontaneous labour, at term, more than 37 weeks with single fetus in vertex presentation with no maternal obstetrical problems and no fetal distress on admission.

The cases were selected randomly from delivery room in the same maternity hospital. Women with previous scar were excluded from the study. The active management of labour protocol was based on strict diagnosis of labour which was based on the presence of uterine contractions supported by spontaneous rupture of the membranes or passage of blood stained mucus vaginally, dilatation of the cervix on pelvic examination which is ≥ 3 cm.

Oxytocin augmentation was defined as stimulation after the spontaneous onset of labour and was initiated in multiparous women, if witihn two hours of admission, cervical dilatation had not progressed by 1 cm / hr, oxytocin was administered by infusion, one unit / 500cc of 5% dextrose solution commencing 15 drops/min, and increasing incrementally every 15 minutes. Oxytocin flow was regulated manually by resident doctor who accompanied each patients in labour under senior supervision and responsibility.

During the first stage of labour progress was measured in term of cervical dilatation, the slowest acceptable rate was 1cm/hr. particular attention was directed to cervical dilatation at first two hours.

During the second stage of labour progress was measured in terms of head descent followed by rotation of head and pressure on pelvic floor until delivery. A maximum of one hour was allowed for this stage of labour.

The onset of labour, starting the clock on length of labour, was established when the diagnosis of true labour was made. Duration of labour was equated with time spend in the labor unit in hours.

Dystocia was defined as failure to progress in labour either of arrest of cervical dilation in the first stage or because of arrest of descends of presenting part in second stage labour. Fetal heart rate (FHR) assessment was performed by intermitted auscultation using fetal stethoscope.

Fetal intolerance was defined as dropping of FHR below a rate of 110 beat/ minute or above a rate of 180 beat / minute in absence of uterine contraction. If fetal heart rate abnormality or meconium stained amniotic fluid was detected, oxytocin was withheld until normal fetal heart rate was achieved.

Instrumental delivery or cesarean sections were considered as appropriate method of delivery during these phases whenever the need arose.

At birth, neonatal examination was performed by paediatrician on duty, perinatal asphyxia was assessed by Apgar score, admission to the neonatal intensive care unit (NICU) and follow up of all babies during the first week of life by re-examination in the out patient clinic.

The chi-square (X^2) analysis was used for statistical analysis for the frequency data. The difference was considered significant if the p-value was <0.05. Fisher's exact test was used where the cell size was small. The significance at the 5% level.

Results

During the period of study, with 506 of 6061, the total deliveries in the hospital, were fulfilling the criteria. They were the subject of the study (cases and controls).

The result reported include 249 women underwent active management of labour, they were identified as "cases group" and 257 women did not require active management of labour were identified as "control group".

Cases and control were approximately similar in regard to age and parity.

The mean duration of total length of labour, first, second and third stage of labour were shown in Table I. The mean duration of first stage of labour in oxytocin augmented group was 4.16 ± 1.50 hrs in comparison to 5.4 ±1.7 hrs. in control.

Table I. Mean length of labour in oxytocin augmented and control group.

	Oxytocin augment N: 249	Control N = 257	Signi-ficance p-value
Total length of labour	4.5 ±1.75	5.8 ±1.98	<0.001
1st stage	4.16 ±1.50	5.4 ±1.7	<0.001
2nd stage	0.20 ±0.31	0.27 ±0.41	>0.05 NS
3rd stage	0.11± 0.06	0.12± 0.06	>0.05 NS

NS: not significant

Mean duration of first stage of labour in oxytocin augmented women was reduced by 1.3 hrs. in comparison to control. This difference was statistically significant.

Ninety eight (98%) women in the oxytocin augmented group were achieved spontaneous normal vaginal delivery in comparison to ninety six (96%) women in control group. The difference was statistically not significant as shown in Table II.

The incidence of instrumental delivery in oxytocine augmented was 0.4% in comparison to 1.2% in control. The difference was statistically not significant. The incidence of emergency cesarean sections were 1.6%, 2.7% in both groups respectively. The difference was statistically not significant (Table II).

One of four (0.4%) cesarean section was performed for arrest of cervical dilatation and two (0.8%) for fetal distress in oxytocin augmented women,

while in control group two of seven (0.8%) for arrest of cervical dilatation and four (1.6%) for fetal distress (Table III). There was no uterine rupture among oxytocin augmented women.

Table II. Mode of delivery in oxytocin augmented patients and control

	Oxytocin augmentation		Control		Signi-ficance
	N= 249	%	N= 257	%	
Normal vaginal delivery	244	98%	247	96%	0.9284 NS
Instru-mental delivery	1	0.4%	3	1.2%	0.6435 NS
Cesarean section	4	1.6%	7	2.7%	0.5303 NS

NS: not significant

Table III. Indications of C.S. in oxytocin augmented patients and control

	Oxytocin augmentation		Control		Signi-ficance
	N= 249	%	N= 257	%	
Total C.S.	4	1.6%	7	2.7%	0.5303 NS
Arrest dilatation	1	0.4%	2	0.8%	0.9754 NS
Arrest of descend	1	0.4%	1	0.4%	0.4925 NS
Fetal intolerance	2	0.8%	4	1.6%	0.7169 NS

NS: not significant

Other finding in this study is that the hospital perinatal mortality rate among multiparous women were the same (4/1000) in both groups (Table IV).

The cause of perinatal death was observed in oxytocin group was in single case due to respiratory distress syndrome (RDS) the baby died few hours after birth, while the cause of death in control group was late neonatal death due to congenital heart disease (Table IV).

Table IV. Neonatal outcome in oxytocin augmented patients and control.

	All patients		Signi-ficance p-value
	Oxytocin augment N: 249	Control N = 257	
Apgar score <7 at 1 min.	7 2.8%	6 2.3%	0.9607 NS
Apgar score <7 at 5 min.	3 1.2%	4 1.6%	0.962 NS
NICU Admission	3 1.2%	4 1.6%	0.962 NS
Neonatal death	1 0.4%	1 0.4%	1.742 NS

NS: not significant

Oxytocin augmentation did not influence the incidence of those perinatal complications.

Discussion

For more than 25 years active management of labour has been successfully used at the National Maternity Hospital in Dublin according to the protocol instituted by O'Driscoll et al [4]. The basis of active management rests on the tenets of an accurate diagnosis of true labour, early amniotomy, selective use of high-dose oxytocin, limitation of the total duration of labour to 12 hrs, supportive maternal intrapartum care and antenatal education[1].

The current study did show a significant decrease in the length of labour of actively managed patients in comparison to control. It was significantly shorter by 1.3±0.23 hours (4.5 ± 1.75 hours in oxytocin augmented women and 5.8 ± 1.98 hours in control $p<0.001$), most notably in first stage labour (Table I). This is in agreement with study done by

Lepoz-Zeno Gas[5] who found that length of labour in active management group was shortened by 1.7 hours.

In multiparous women, great care must be taken before augmenting uterine action with oxytocin because there is a grave risk of causing uterine rupture by inj7udicious use of oxytocin. It should be ascertained that the birth canal is most likely adequate for the size of the fetal head and that the fetal head is well flexed so as to utilize its smallest diameters to negotiate the birth canal[2].

In this study, there was no case of uterine rupture among the oxytocin augmented women. This further emphasizes the safety of active management protocol used among a minimum risk parous patient (p 1-3) with great caution and under senior supervision and resposibility. The rate of emergency cesarean section were 1.6% and 2.7% in oxytocin augmented women and control, respectively. This reduction of caesarean section rate did not reach statistical significant. This is in agreement to study done by Mola et al[10], who found 2.4% caesarean section rate.

The incidence of instrumental delivery (low forceps) among oxytocin augmented women was 0.4% in comparison to 1.2% among control (Table II). This is in contrast to Mola et al study[10].

There is a trend toward a reduced caesarean section rate and instrumental delivery among patients underwent active management of labour. This reduction of caesarean section rate did not reach statistical significant. Further trials of efficacy and safety of active management of labour seen warranted as we shall continue our effort to lower the rate of abdominal delivery in the same maternity hospital; beside reduce the incidence of repeated caesarean section rate.

Other finding in our study is that hospital perinatal mortality rate in the oxytocin augmented group was the same (4/1000) in both groups. This is in agreement with other study done by Mola[10] who found that there is no difference in perinatal outcome for those who were augmented and control.

Conclusion

The current study supports the previous observation that actively managed labour leads to shorter labour and lower incidence of caesarean section rate and operative vaginal delivery without any increase in the incidence of fetal morbidity and mortality, beside that, it reduces the incidence of repeated caesarean section.

In addition, it confirms the oxytocin is completely safe in parous women, in terms of the risk of uterine rupture, it is used with great care under close senior supervision.

The success of this protocol lies in its careful application and the skilled medical and nusring supervision.

Tococardiography should be available in the labour ward for fetal heart rate monitoring.

References

1. Rebecca Rogers, George J. Active management of labour: Does it make a difference. Am J Obstet Gynaecol 1997; 177: 599-605.
2. Gary Gunningham F, Paule C, Norman F, Kenneth J. Leveno, Larry C. Cilstr ap III, Cary DV Hankins, Steven L. Clark. Dystocia: Abnormalities of the expulsive forces. Williams obstetrics. 20th edition 1997. Appleton and Lange Stamford, Connecticut printed in USA. P415-427.
3. MacDonald. Management of labour practical obstetric problems. Lloyd - Luke (medical books) Ltd., 49 Newman St., London 1979, p. 563.
4. O'Driscoll K, Jackson R, Callagher JT. Prevention of prolong labour. BMJ 1969; 2: 477-81.
5. Lopez-Zeno JAS, Peaceman AM, Adashek JA, Socol ML.

A controlled trail of program for the active management of labour. N Engl J Med 1992; 326: 450-4.

6. Frigolello FD, Lieberman E, Lang JM, Cohen A, Barss V, Ringer S, et al. A clinical trail of active management of labour. N Engl J Med 1995; 333: 745-50.

7. Wein P. Efficacy of different starting doses of oxytocin for induction of labour. Obstet Gynaecol 1984; 74: 863-868.

8. Kieran O'Dirscoll and Delon. Oxytocine in labour: Active management of labour. WB Saunders Co. Ltd. London, Philadelphia Toronto 1980, p.42-45.

9. Kieran O'Driscoll , Michael Foley. Active management of labour as an alternative to C.S. for dystocia. Obstet Hynecol 1984; 63: 485.

10. Mola G, Rageau O. Augmentation of labour by a standard protocol in Papua New Guinea; Asia Oceania J Obstet Gynaecol 1990; 16(3): 219-24.