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A Comparative Study Between Intermittent Auscultation and Cardiotocogram in Low Risk Pregnancy During Labour

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ABSTRACT

The goal of foetal heart rate (FHR) monitoring has been early identification of the foetus at risk for hypoxic insult. The aim of this study is to establish the relation between FHR monitoring (cardiotocogram (CTG) and intermittent auscultation) and foetal outcome and mode of delivery. It is a prospective observational comparative study carried out on the maternity ward of the Zawia hospital.

Study population consists of 200 women in labour having the criteria of low risk group including singleton pregnancies between 37-40 weeks gestation, in 100 of them foetal monitoring was done by continuous electronic monitoring by CTG, the other 100 was monitored using intermittent auscultation by Pinard stethoscope (foetoscope). Caesarean sections were performed for both groups (31% of electronic monitoring group and 6% of Pinard stethoscope monitoring group) (P = 0.000 which is statistically significant).

Three cases were delivered by instrumental delivery (ventose), one in CTG and 2 in (foetoscope) group. Abnormalities in foetal heart rate were detected in 12% of electronic monitoring group and in 3.5% of the Pinard stethoscope group.

The Apgar score of babies in both groups nearly the same (P = 0.411). The number of babies transferred to intensive care unit is higher in CTG group (26%) than the other group (20%) P = 0.374. One baby in CTG group had neonatal seizure.

We conclude that, abnormalities in foetal heart rate were more reliably detected by electronic monitoring than with Pinard foetoscope. However, use of continuous electronic monitoring carry higher rate of caesarean section with no significant difference in neonatal outcome.

Keywords - *Intermittent auscultation; Foetal heart rate; Cardiotocogram.*

INTRODUCTION

In many developing countries large number of infants die in labour without structural abnormalities and a proportion of them suffer from sustained handicap due to birth hypoxia and cerebral palsy with severe mental retardation.[1] It is important to raise these as issues, as they are most certainly preventable with the right care.

The goal of foetal heart rate monitoring has been the early identification marker of a foetus at risk of hypoxia which would enable the right action to be taken, in order to save the baby in question.[2]

Many techniques of foetal heart monitoring including clinical and electronic monitoring have been used, applied antenatally and during labour. The foetoscope remained until recently the main clinical method used for monitoring, up until the cardiotocogram (CTG) was recently developed.

The method used for foetal monitoring must be effective, performed correctly, its result must be interpreted accurately and the interpretation must provoke an appropriate and timely response.[3] Evaluation of the ability of intermittent auscultation to predict poor foetal outcome is still lacking with methodological problems as it is impossible to exclude the confusing effects of clinical intervention on the outcome. Also the diagnosis of foetal distress is often not solely based on abnormal foetal heart rate.

However continuous electronic monitoring is effective in detecting a hypoxic infant but results increasing the chance of having a caesarean section,[4] the use of foetal blood samples tended to limit the increased use of caesarean delivery and to promote operative vaginal delivery.

Many trials of low risk women showed that intra partum deaths were equally preventable by all of the methods of foetal heart rate monitoring currently employed, provided that the importance of prompt recognition of abnormal foetal heart rate was recognized.[5]

Our study evaluates the validity of intrapartum CTG in predicting foetal outcome in comparison with intermittent auscultation and compares the abilities of intermittent electronic monitoring and the Pinard foetoscop to detect abnormalities in foetal heart rate and their contribution to the mode of delivery and foetal outcome.

MATERIALS AND METHODS

We carried out a prospective observational comparative study at the Zawia Teaching Hospital, Obstetrics and Gynaecology Department (labour ward).

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Our study population consisted of 200 women in labour classified in the low risk group criteria including singleton pregnancies between 37 to 40 weeks gestation and have no other obstetric complications, half of them were monitored by intermittent auscultation and the other half by CTG. The patients were selected from labour ward over a period of 3 months from 1st April 2005 to 1st July 2005.

RESULTS

Age distribution

The age of the mothers under study ranged between 17 and 42 years, with mean age = 29.5±5.2 years, 67% of which were aged between 25-35 years, the younger (<25 years) mothers made 19%, of the study focus group. The >35 years age bracket contributed the least at 15% (Figure 1).

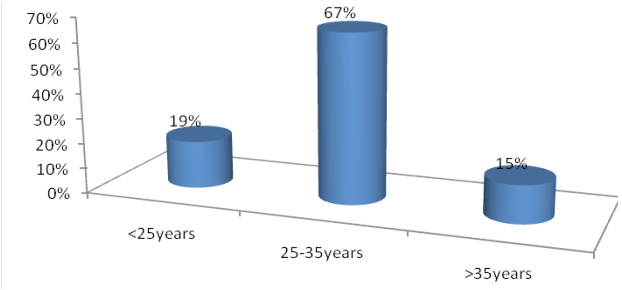

Figure 1: Age distribution of mothers under study.

Parity

The parity of women under study ranged between PG to 10 children with the mean number of children 1.63±1.77, PG made 34%, 51% of the mothers had 1-3 children, 4-5 children were the parity of 12% of the mothers under study, and least percentage was 4% for mothers with 5 children and or more (Figure 2).

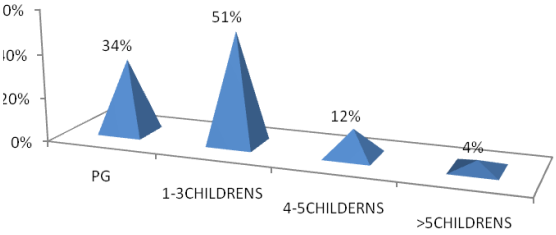

Figure 2: Parity distribution of mothers under study.

Characteristic of labour

Duration of first stage

The duration of first stage ranged between one hr to twelve hr with mean duration 3.3±2.5 hr, 97.4% had normal duration, 2.6% had prolonged first stage (Figure 3).

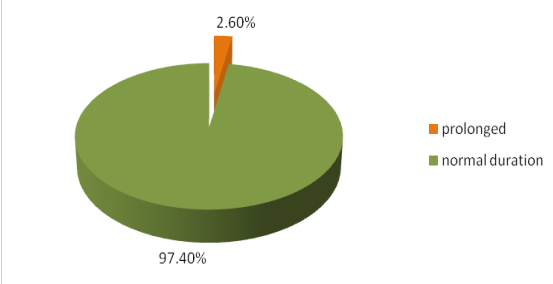

Figure 3: Distribution of duration of first stage of labour of cases under study

Duration of second stage

After exclusion of the cases delivered by C/S during first stage of labour the duration of second stage of labour ranged from 1minute to 60 min with mean 11.3±9.7 min, 81% of the mothers delivered within normal duration, and 0.5% had prolonged 2nd (Figure 4) .

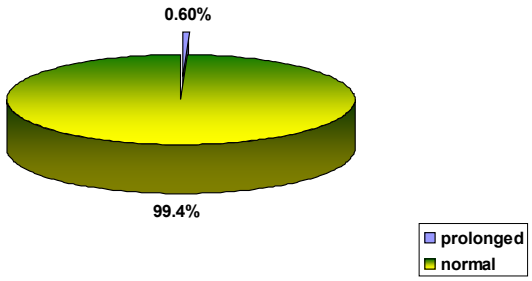

Figure 4: Distribution of second stage of labour of cases under study.

Comparison between intermittent auscultation and CTG

In this section of the result we will compare between intermittent auscultation and CTG monitoring regarding of mode of delivery, Apgar score, and neonatal outcome:-

1. *Mode of delivery*

By studying the relation between type of foetal heart monitoring and mode of delivery, we found that 68% of foetuses monitored by CTG delivered normally, comparing with 92% monitored by foetoscope, 31% of foetuses monitored by CTG delivered by C/S comparing with 6% monitored by foetoscope, vacuum extraction needed in only one case (1%) from the group monitored by CTG but it needed in 2 cases (2%) from the group monitored by foetoscope (Table 1), and by using of Chi square test, the difference between expected and observed count was statistically significant ($P = 0.000$)

Table 1: Relation between mode of delivery and type of FHR monitoring.

	Monitoring		Total
	CGT monitoring	Fetoscope monitoring	
FTNVD	68 68.0%	92 92.0%	160 80.0%
CS	31 31.0%	6 6.0%	37 18.5%
FTVE	1 1.0%	2 2.0%	3 1.5%
Total	100 100%	100 100%	200 100%

2. *Apgar score*:

The mean Apgar score at zero time of the babies monitored by CTG was 8.47 and the Apgar score at zero time for the other group was 8.6, and by using of *T* student test of independent samples (Table 2); the difference between these two means was statistically not significant ($P = 0.411$).

Table 2: Relation between Apgar score and type of FHR monitoring.

Monitoring	N	Mean	Std. deviation	Std. error mean
Apgar score of CTG monitoring	100	8.47	1.16	0.12
Baby at first min. fetoscope monitoring	100	8.60	1.07	0.11

3. *Neonatal outcome*:

65% of babies monitored by CTG in good general condition and stay with mother compared with 74% monitored by foetoscope, 9% monitored by CTG need admission in ICU compared with 6% monitored by foetoscope, and 26% need observation monitored CTG compared with 20% monitored by foetoscope (Table 3) and by using of Chi square test, the difference between expected and observation was statistically significant.

Table 3: Relations between neonatal out come and type of FHR monitoring.

	Monitoring		Total
	CGT monitoring	Fetoscope monitoring	
Mother	65 65.0%	74 92.0%	139 69.5%
ICU	9 9.0%	6 6.0%	15 7.5%
Observation	26 26.0%	20 20.0%	46 23.0%
Total	100 100%	100 100%	200 100%

$P = 0.374$

DISCUSSION

In Obstetric Department in Zawia Educational Hospital the management protocol of labour include use of partogram and augmentation of labour by oxytocin if no obvious cephalopelvic disproportion[6,7], foetal monitoring is either by intermittent Pinard stethoscope or by continuous electronic monitoring (CTG), in our hospital not always have facility for foetal blood sampling, and use of epidural analgesia rarely done during labour. Rate of C/S in Zawia hospital is 25% and the number of delivery per year around 7000.

Cardiotocography (sometimes known as electronic foetal monitoring), has widely been adopted in labour.[8-10] There is debate about its overall effectiveness as well as the relative merits of routine application versus use for high-risk pregnancies only.[11] It records changes in the foetal heart rate and their temporal relationship to uterine contractions.[2] Abnormal pattern of foetal heart detected more in CTG group. Our study showed increase in C/S rate in CTG group, this may be because CTG more sensitive in picking up any foetal heart rate abnormality and also due to weakness in our study in relying up on CTG without foetal sampling, this result going with study of what.[13] Although there is increased number of instrumental delivery in CTG group in previous study[14], in our study there is no significant different between both groups.

Although there was no significant difference between the groups in neonatal Agar scores, there were more babies with low Apgar score in continuous electronic monitoring group. Fewer babies in the foetoscope monitoring group needed admission to the neonatal unit compared with the other group. This finding concurs with result of Dublin trial.[15] Continuous cardiotocography during labour is associated with a reduction in neonatal seizures, but no significant differences in cerebral palsy, infant mortality or other standard measures of neonatal well-being.[16] In our study neonatal seizures occurred in one case also hypoxic encephalopathy, this may be due to the small sample size of our study, but it does indicate that the two methods were similar in their capacity to detect important abnormalities in foetal heart rate and the same neonatal outcome. Although electronic monitoring was more sensitive in picking up any foetal heart rate abnormality, there were still more infants born with hypoxic ischemic encephalopathy these were due to delays in performing operative deliveries and emphasize the need for appropriate and timely action irrespective of what method is used for monitoring foetal heart rate.[17] Because not always have facility for foetal blood sampling we miss the advantage of CTG in detection of reduced variability of foetal heart rate.

CONCLUSION

In low risk women the intrapartum deaths were equally preventable by all of methods of foetal heart rate monitoring currently employed provided that the importance of prompt recognition of abnormal foetal heart rate was recognized. Abnormalities in foetal heart rate were more reliably detected by electronic monitoring than with Pinard stethoscope. Use of continuous electronic monitoring method carries higher rate of caesarean section, with no significant difference in neonatal outcome.

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