

# Effects of Amniotomy versus Spontaneous Rupture of Membrane on Progress of Labour and Foetal Outcome in Primigravidae

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## ABSTRACT

**OBJECTIVES:** To compare the efficacy of amniotomy with spontaneous rupture of membranes in terms of progress of labour, mode of delivery and foetal outcome in primigravidae.

**DESIGN:** Comparative study.

**PLACE AND DURATION:** The study was conducted at Gynae Unit-1 Jinnah Postgraduate Medical Center, Karachi over a period of year from 10<sup>th</sup> July 2002 to 9<sup>th</sup> July 2003.

**PATIENTS AND METHODS:** Two-hundred primigravidae in active labour (at least 4 cm cervical dilatation) were randomly assigned for amniotomy. Subjects were equally divided into two groups. In subjects of Group A amniotomy was carried out and subjects of Group B were left for spontaneous rupture of membranes. Results of both groups were compared for duration of labour, mode of delivery and foetal outcome in terms of Apgar score at 5 minutes and admission to nursery.

**RESULTS:** The mean duration of labour was 6.66±1.4 hrs in Group-A and 7.66±1.75 hrs in Group B showing a significant decrease of 1 hour in duration of labour. There was no significant difference in terms of mode of delivery; foetal Apgar at 5 minutes and neonatal admission to nursery in first 24 hrs following delivery also showed non-significant difference between the two groups.

**CONCLUSIONS:** Our study showed that artificially rupturing the membranes during active labour in primigravidae significantly decrease the duration of labour while there was no significant difference in terms of mode of delivery and foetal outcome between the two groups.

**KEY WORDS:** Amniotomy, Apgar score, cesarean section, spontaneous rupture of membrane, primigravidae.

## INTRODUCTION

Amniotomy also called artificial rupture of membranes (ARM) is an intervention to induce or augment the labour. The mechanism of action behind amniotomy is thought to be the release of prostaglandin E<sub>2</sub> (PGE<sub>2</sub>) and risen oxytocin level.<sup>[1]</sup>

Amniotomy was first introduced by Thomas Denman of Middlesex hospital in 1756.<sup>[2]</sup> It has long been in obstetric practice because of general belief that it reduces the duration of labour.<sup>[3-5]</sup>

Some data suggest high rate of caesarean section<sup>[6]</sup> in association with amniotomy while others do not.<sup>[7]</sup>

Foetal outcome seems similar in case of amniotomy as well as in those cases who were left with their membranes intact for as long as possible.<sup>[8]</sup>

In recent years an increasing appreciation of relationship between oligohydroamniosis and foetal distress as a result of umbilical cord compression has been observed. The recognition of this relationship has therefore led the clinicians to wonder whether they may be causing iatrogenic foetal compromise with elective amniotomy.

Very little data currently exists in modern obstetric practice to address this concern. Therefore we de-

signed and conducted this study to evaluate the effects of elective amniotomy on duration of labour, mode of delivery as well as newborn condition in our set up.

## PATIENTS AND METHODS

This comparative study was conducted at Jinnah Postgraduate Medical Centre, Karachi from 10<sup>th</sup> July 2002 to 9<sup>th</sup> July 2003. Cases for this study were collected at Casualty/Obstetrics and Gynaecology Unit-I. Primigravidae with alive singleton pregnancy, and cephalic presentation who came with spontaneous onset of labour were included in the study. Pregnancies with risk factors like pregnancy induced hypertension (PIH), diabetes mellitus, antepartum haemorrhage, were excluded from the study. After taking detailed history, general examination was done. Height of fundus, lie and presentation were recorded by abdominal examination. Foetal heart sounds were checked for rate and regularity. Pelvic assessment was performed to see the condition, effacement and dilatation of cervix, and to confirm that membranes were intact. Women confirmed to be in active phase of labour when having cervix dilated at least 4-cm were enrolled for the study.

After obtaining the informed consent, the subjects with odd serial numbers were placed in Group A (amniotomy) and subjects with even serial number were placed in Group B (spontaneous rupture of membranes).

**Group-A (Amniotomy):**

In this Group, the membranes were ruptured by using Kocker’s forceps in a controlled manner under aseptic measures with prophylactic antibiotics cover. The liquor was allowed to drain, while keeping two fingers in vagina making sure that the fluid drained slowly thus avoiding cord prolapse and placental abruption.

Colour of liquor was noted, whether colourless/meconium or blood stained. If the colour of liquor was green or blood stained, patients were excluded from the study and kept under strict monitoring of foetus with continuous CTG.

If the colour of liquor was clear, then patient was included in the study and labour was followed by keeping record of foetal heart sounds (FHS) ½ hourly and vaginal examination 2 hourly to see the progress of labour. Partogram was maintained in each and every case and continuous CTG monitoring was carried out in suspected cases. In non-reactive CTG cases emergency c-section was performed, while with reactive CTG cases monitoring of labor was continued.

**Group-B (spontaneous rupture of membrane):**

Same procedure of inclusion and exclusion was adopted. Patients were left for progress of labour with intact membranes as long as possible i.e. till full dilatation of the cervix or if there was any foetal tachycardia or bradycardia. Patients were put on CTG monitoring to see any type of distress e.g. decreased variability or any decelerations, foetal heart rate below 110 or above 160. If there was no sign of distress, they were allowed to labour with intact membranes otherwise membranes were ruptured to see the colour of liquor to decide if patient needed immediate delivery.

Partograph was filled in every case to see progress of labour.

A predesigned proforma was used to record the data regarding duration of labour, caesarean section, apgar score 0-5 minutes, need of neonatal resuscitation and

admission to nursery. T-test was applied to compare continuous variables along with calculating means and standard deviations, whereas Z-scores were calculated for discrete variables. P-values up to 0.05 were considered significant. SPSS version 10 was used for data analysis.

**RESULTS**

One hundred subjects were enrolled in each study group.

Overall mean age of the patients was 24.69±3.03 (ranging from 18 to 32) years. The average age in group-A was observed 24.69±3.19 (ranging from 18 to 32) years while in Group-B it was observed 24.95±2.86 (ranging from 18 to 31) years.

All women were at least 37 weeks of gestational age. Mean gestational age was noted 38.41±1.03 weeks.

The mean duration of labour was 6.66±1.41 in group-A and 7.60±1.75 in Group-B. It was significantly low in group-A than in group-B with P<0.05 (**Table I**).

Among five modes of delivery, majority (57%) delivered vaginally with episiotomy.

The Cesarean rate was 8% in group-A and 10% in group-B (**Table II**). This 2% increase in Cesarean section rate in group-B was due to prolonged labour.

Mean apgar score in group-A was 7.37±0.63 and in group-B it was 7.30±0.67 (**Table I**). Data revealed a non-significant difference between mean Apgar score at (P=0.449).

Neonatal admission rate to nursery at 1<sup>st</sup> 24 hours in group-A was 2% and in group-B. it was 3%, which was non-significant (P>0.05).

**DISCUSSION**

Labour is a physiological process and it brings a great joy and happiness to majority of families. The aim of successful labour management is to ensure the safe delivery of healthy baby to a healthy mother. Correct diagnoses of onset of true labour, use of partograph, and timely medical or surgical interventions are the important factors to achieve good maternal and foetal outcome.

A labour lasting longer than 12 hours in nulliparous

**TABLE I: GROUP COMPARISON OF STUDY FACTORS**

Factors	Group		Significance	95% confidence Interval of the difference	
	Group-A Amniotomy group)	Group-B Spontaneous group)		Lower	Upper
Time duration of labour (hrs)	6.66 ± 1.41	7.60 ± 1.74	t = 4.181 p < 0.001 *	-1.382	-0.496
Foetal Apgar at 5 minutes	7.37 ± 0.63	7.30 ± 0.67	t = 0.759 p = 0.449	-0.112	0.252

\* Shows statistical significance at p< 0.05.

**TABLE II: COMPARISON OF MODES OF DELIVERY IN BOTH STUDY GROUPS**

Mode of delivery	Group		Significance
	Group-A (Amniotomy group) n = 100	Group-B (Spontaneous Rupture group) n = 100	
Spontaneous vaginal delivery	17 17.0%	10 10.0%	Z = 1.43 P = 0.08
Spontaneous vaginal delivery with episiotomy	53 53.0%	61 61.0%	Z = 1.14 P = 0.13
Forceps delivery	10 10.0%	8 8.0%	Z = 0.50 P = 0.30
Vacuum delivery	12 12.0%	11 11.0%	Z = 0.22 P = 0.40
Cesarean section	8 8.0%	10 10.0%	Z = 0.50 P = 0.30

\* Shows statistical significance at  $p < 0.05$ .

**TABLE III: NEONATAL INTENSIVE CARE ADMISSION (n=100)**

	Group A	Group B
Admitted in nursery	2%	3%
Not admitted in nursery	98%	97%

woman and 8 hours in multiparous woman is regarded as prolonged. There is high incidence of foetal hypoxia and need for operative delivery associated with prolonged labour.

To avoid these deleterious effects of prolonged labour, O'Driscoll and co-workers in 1960's introduced "Active Management of Labour". It involved diagnosis of labour, amniotomy, oxytocin infusion and provision of a member of healthcare team.<sup>[9]</sup>

Artificial rupture of membranes (amniotomy) to shorten labour has been widely practiced by obstetricians<sup>[10,11]</sup> but some opponents have argued that it increases the risk of infection, cord prolapse, abruption placenta, which in turn increases maternal and perinatal morbidity and mortality.<sup>[12]</sup>

Our results with regard to duration of labour co-relates with that of Fraser et al,<sup>[13,14]</sup> who also concluded that amniotomy shortens labour in nulliparous women significantly. When mode of delivery was observed it was seen that almost 70% of patients had vaginal delivery; 22% patients in group-A and 19% in group-B had instrumental delivery. The cesarean section was performed in 8% of patients in group-A while 10% in group-B, therefore, it is seen that there is no significant difference statistically. This matches with the result of Jon FR, et al.<sup>[14]</sup>

On the other hand our conclusion does not co-relate with the study carried in PIMS hospital Islamabad<sup>[15]</sup> and Smyth et al<sup>[16]</sup>, which show increased trend toward

C-section associated with amniotomy.

The mean Apgar score at 5 minutes in group-A was 7.37+0.63 while in group-B it was 7.30+0.67 (non-significant). Many others had concluded the same result.<sup>[15,16]</sup>

Randomized controlled trials have found no difference in cesarean section rates, rate of operative vaginal delivery or neonatal outcome.<sup>[17]</sup> It again supports our results with regards to operative delivery and neonatal outcome.

In the developed countries many trials do not recommend amniotomy to accelerate labour<sup>[16,17]</sup>, but in developing countries like ours the practice of amniotomy seems to be justified. In government hospitals there are many patients in the labour room with few doctors, nurses and midwives. This creates difficulty for paramedics to do proper monitoring of every patient for elongated period. In these circumstances, amniotomy serves many advantages e.g. it accelerates labour thus decreasing overall monitoring time. Also the colour of liquor gives idea about the foetal wellbeing, which helps in deciding the mode of delivery and making preparation for neonatal resuscitation.

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