

# Risk of Abruption Placenta in Women with Preeclampsia Undergoing Labour Induction with Misoprostol

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## Abstract

**Objectives:** To evaluate the risk of abruption placentae in women with preeclampsia undergoing labour induction with misoprostol.

**Patients and methods:** This is a retrospective, descriptive and analytical study of 1.136 cases of labour induction with misoprostol performed vaginally at "Roi Baudouin" Health Centre in Dakar suburbs from 2009 to 2011. For each patient, were collected and analysed sociodemographic data, pregnancy and birth characteristics. The population was divided into 2 groups. The first group concerned patients who had preeclampsia and the second group, patients undergoing induction of labour for another indication. In each group, rate of abruption placentae was analysed. Data were entered and analysed using SPSS 17.0 software.

**Results:** Over 3 years, 1.136 patients underwent labour induction with misoprostol on 16.125 births (7%). The average age of patients was 27.2 years, the mean gravidity 2 and the average parity 2.47. Labour induction was performed for preeclampsia in 30.1% of cases. For 94.5% of patients, 50 µg was used as double (100 µg) was used in 63 patients (4.5%). Abruption placenta occurred in 4% of cases in patients with preeclampsia and in 0.3% of cases in patients who underwent induction for another indication ( $p < 0.0001$ ).

22 intrapartum deaths (2.1%) were recorded and 20 early neonatal deaths (2%). The transfer rate in neonates was 14.8%. Neonatal complications were more frequent in the preeclampsia group.

**Conclusion:** Induction of labour with misoprostol on preeclampsia is associated with a high risk of abruption placentae, low Apgar score at the 5<sup>th</sup> minute and intrapartum and early neonatal deaths.

**Keywords:** Preeclampsia; Misoprostol; Abruption placenta; Dakar

## Introduction

Abruption placentae are defined as the partial or complete separation of a normally implanted placenta from the uterine wall, before delivery, after the 20<sup>th</sup> week of pregnancy. It is an important cause of maternal and perinatal mortality and morbidity [1]. Early, severe pre-eclampsia and chronic hypertension carry significantly increased risks. As disease progression can only be halted by delivery of the fetus and the placenta, induction of labour in cases of mild or moderate preeclampsia is often the method of choice to avoid caesarean section associated complications [2].

Dinoprostone is the most prescribed molecule in labour induction for its effectiveness and safety. Misoprostol, a synthetic analogue of PGE<sub>1</sub>, is used in obstetric as out label.

In Africa, use of prostaglandins encounters an economic obstacle: high price (over 30 euros) and storage requiring low temperature until ready for use [3]. Several benefits of misoprostol are in favour of its use especially in developing countries: it is inexpensive, simple to administer and can be stored at room temperature.

However, some adverse outcomes have been described with obstetrical applications of misoprostol. These include maternal diarrhea, uterine hyperstimulation leading to fetal heart abnormalities, fetal deaths and uterine rupture [4].

A retrospective study has shown a higher risk of placental abruption among preeclamptic women undergoing cervical ripening with misoprostol compared with PGE<sub>2</sub> [5]. However, in 2010, Tejada et al. concluded their paper with this sentence « *The use of misoprostol in preeclamptic women appears to be safe and is not associated with a higher risk of placental abruption when compared with other prostaglandins.* Concerns about the use of misoprostol in the case of preeclampsia are

not justified » [6]. As data are controversial and use of misoprostol is more effectiveness than other prostaglandins, this study aimed to evaluate its safety in our resource-limited country.

The main objective was to evaluate the risk of placental abruption in women with preeclampsia undergoing labour induction with misoprostol.

## Patients and Methods

This retrospective, descriptive and analytical study took place in a suburb maternity about 17 km from Dakar downtown. This is a reference maternity-unit where 16.125 deliveries were performed during the study period from January 1, 2009 to December 31, 2011. Three obstetricians, 9 trainees and 1 professor of obstetric were in practice in this maternity.

The study population were patients admitted for management of childbirth in which induction of labour with misoprostol was performed regardless of the outcome. Non-harvestable records were excluded. The regimen used for misoprostol was either 50 µg or 100 µg per 6 or 8 hours. Demographic, medical and obstetrical data of women were obtained from patient's medical records and delivery registers.

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Preeclampsia was defined as new hypertension (systolic blood pressure of  $\geq 140$  mm Hg and/or diastolic blood pressure of  $\geq 90$  mm Hg) and substantial proteinuria ( $\geq 300$  mg in 24 h) at or after 20 weeks' gestation [7].

Diagnosis of placental abruption was documented in patient's records. The following criteria were considered in the definition: vaginal bleeding, uterine tenderness or back pain, fetal distress, high frequency of contractions, hypertonus, bloody amniotic fluid at delivery and placental hematoma at clinical examination after delivery. Ultrasound scan wasn't performed for diagnosis.

Data were analysed using SPSS 17.0 software. Averages and extremes were calculated for scale variables. For qualitative variables, percentages were established. Continuous variables were compared using ANOVA and those in scale using the Chi 2 test or Fisher's exact test. The level of significance was 0.05.

## Results

Over 3 years, 1.136 patients underwent labour induction with misoprostol on 16.125 births (7%). The mean age was 27.2 years, mean gravidity 2 and mean parity 2.47. The main reason of labour induction was premature rupture of membranes (51.7%) followed by preeclampsia (30.1%) as reported in Table 1. All patients of the study underwent cervical ripening with misoprostol, vaginally. For 94.5% of patients, 50  $\mu$ g was used as double (100  $\mu$ g) was applied in 63 patients (4.5%). On full-term pregnancies, labor induction rate was 93.1%. On preterm and prolonged pregnancies, the failure rate ranged between 14.3% and 15.8% ( $p < 0.0001$ ).

Maternal morbidity was represented by hyperkinesia (1.3%), uterine rupture (0.6%) and placental abruption (1.5%). Seven uterine ruptures were recorded: 3 on full term pregnancies (0.3%) and 4 in preterm pregnancies (1.8%) ( $p = 0.036$ ). Two uterine ruptures occurred in primiparous (0.2%) and 5 in multiparous (0.4%) ( $p = 0.2$ ). Hundred micrograms of misoprostol was associated with a higher rate of uterine rupture (6.3%) compared to 50 micrograms (0.3%) ( $p < 0.0001$ ). Abruption placenta occurred in 17 cases: 5 on full term pregnancies and 12 on preterm pregnancies ( $p < 0.00001$ ). The occurrence of placental abruption was not related to the dose used, 50  $\mu$ g were used for all placental abruption cases. The only characteristic significantly associated with clinical placental abruption was the presence of preeclampsia associated with preterm pregnancy ( $p < 0.0001$ ) as shown in table 2.

Regarding to the reason of cervical ripening, the three others cases were 2 fetal death and one premature rupture of membranes. One maternal death due to uterine rupture was recorded (0.08%). Of the 1,003 fetuses alive at the entrance examination, we recorded 22 intrapartum deaths (2.1%) and 20 early neonatal deaths (2%). The transfer rate in neonatology was 14.8%. Intrapartum deaths occurred on a course in preeclampsia 81.8% of cases (18/22) with 4 cases of abruption placenta.

Indications	N	%
Premature rupture of membranes	588	51,7
Preeclampsia	342	30,1
Fetal death	99	8,7
Prolonged pregnancy	45	4
Other indications	62	5,6
<b>Total</b>	<b>1.136</b>	<b>100</b>

Table 1: Distribution of patients according to the indication of labour induction.

Variables	Rate of abruption placenta (n/N)	%	P value
<b>Term</b>			
Full term	5/900	0,6	< 0,0001
Preterm	12/217	5,5	
<b>Indication of labour induction</b>			
Preeclampsia	14/374	4	< 0,0001
Others	3/762	0,4	

Table 2: Occurrence of abruption placenta according to term and indication of labour induction.

Of the 20 early neonatal deaths, 14 were related to severe preeclampsia with 8 cases of prematurity.

## Discussion

Complicating 2–8% of pregnancies, preeclampsia, along with the other hypertensive disorders of pregnancy, is a major contributor to maternal mortality worldwide. In Latin America and the Caribbean, hypertensive disorders are responsible for almost 26% of maternal deaths, whereas in Africa and Asia they contribute to 9% of deaths [7].

Timely delivery is warranted, because severe preeclampsia is associated with significant maternal and neonatal morbidity. There is debate, however, about the optimal route of delivery especially when preterm and with an unfavorable cervix. Several investigators recommend cesarean section to avoid prolonged induction, especially when at  $< 32$  weeks of gestation [8-10]. Others report the safety and value of induction of labor, even when preterm [6,11,12].

The literature referring to labor induction provides some evidence that the use of misoprostol tends to be more effective than dinoprostone for cervical ripening, especially in patients with an unfavorable cervix. However, the use of misoprostol is frequently associated with uterine hyperstimulation, meconium-stained amniotic fluid and fetal heart tracing abnormalities [13].

As in this study, in a retrospective study, Fontenot et al. observed a higher risk of placental abruption in women with preeclampsia receiving misoprostol compared with those receiving PGE2, thus raising concern about its use in this population [5]. However, De Tejada et al. didn't find such an association on a sample of 403 patients divided into 2 groups [6]. Our sample was significant including 16.125 delivering over three years.

The only factor associated with placental abruption that here found was preeclampsia. At the time of the study, the hospital's protocol was a systematic labor induction with misoprostol in severe preeclampsia whatever the age of pregnancy. Moreover, with these results, policies changed. Actually, in severe preeclampsia, route of delivery is decided taking into account several factors.

Berkley et al. findings enhance counselling about the relative merits of a trial of labour in severe preeclampsia using low dose misoprostol, 25  $\mu$ g. Vaginal delivery within 24 h was common, with less morbidity than a cesarean delivery, in this nulliparous group presenting with severe preeclampsia. The fetuses appeared to tolerate labour and have less respiratory distress as newborn premature infants. The length of postpartum hospitalization was shortened with vaginal delivery, possibly because of fewer cases of endomyometritis and less anemia requiring transfusion [14].

## Conclusion

Induction of labour with misoprostol on preeclampsia is associated with a high risk of abruption placenta, low Apgar score at the 5<sup>th</sup> minute and intrapartum and early neonatal deaths.

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