

Nifedipine for Inhibiting Threatened Preterm Labour in Siriraj Hospital

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ABSTRACT

Objective: To assess the success rate and effects on maternal and fetal outcomes of nifedipine administered as a tocolytic agent to women in threatened preterm labour.

Methods: During 1st January to 31st October, 2007, a total of 53 pregnant women with threatened preterm labour between 20-36 weeks participated in this study. All women were inhibited contraction with nifedipine 20 mg. orally every 30 minutes for 3 times then maintenance with nifedipine SR 20 mg. every 12 hours until 34 weeks. If a neonatal intensive care unit was not available, the inhibition of labour was prolonged until 36 weeks of gestation. If there is any complication with nifedipine, the inhibition of contraction was changed to be bricanyl intravenous form. If there were contraindications to the use of bricanyl, magnesium sulphate was used.

Results: 53 pregnant women with threatened preterm labour participated. The gestational age ranged from 28 to 35 weeks with the mean of 31.6 weeks of gestation. Failure of inhibition with nifedipine was found in 30/53 cases (57%) with a complication of maternal hypotension (90/60 mmHg) for 7 cases (13%) and one case of fetal distress. 23/53 (43%) cases were successful to inhibit contraction with nifedipine. Those patients who failed to inhibit contraction with nifedipine, 28 cases continued to inhibit contraction with bricanyl and 2 with magnesium sulphate (due to placenta previa). All were later successful to stop contraction with bricanyl and magnesium sulphate. Ten pregnant women underwent caesarean section, 31 cases of normal delivery, 3 cases of vacuum extraction, and 2 cases referred to other hospitals (normal delivery). Seven cases were not delivered. The gestational age at delivery ranged from 29 to 40 weeks of gestation with the mean gestational age of 37.7 weeks. The babies' weights ranged from 1,690 to 4,090 grams with the average body weight of 2,742 grams.

Conclusion: Nifedipine cannot be used successfully to inhibit contraction in threatened preterm labour. Other medications can be tried to minimize the incidence of preterm labour.

Keywords: Nifedipine, tocolytic, threatened preterm labour

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Definition¹
Threatened preterm labour was defined as contractions occurring at the frequency of at least 1 time in 10 minutes with no effacement and dilatation of cervix between 20-37 weeks. The examination was taken at least for 30 minutes.

Preterm labour was defined as regular uterine contractions 4 times in 20 minutes or 8 times in 60 minutes with progressive cervical dilatation greater than 1 cm and effacement of at least 80%.

Success to stop uterine contraction was defined as no contraction after inhibition for 1.5 hours with a loading dose of nifedipine.

Maternal hypotension was defined as the systolic and diastolic blood pressure fell by 30 and 15 mmHg, respectively, when compared to the initial blood pressure.

MATERIALS AND METHODS

53 pregnant women participated in this study. All were diagnosed as threatened preterm labour which was defined as contractions occurring at the frequency of at least 1 time in 10 minutes with no effacement and dilatation of cervix between 20-37 weeks. If the causes

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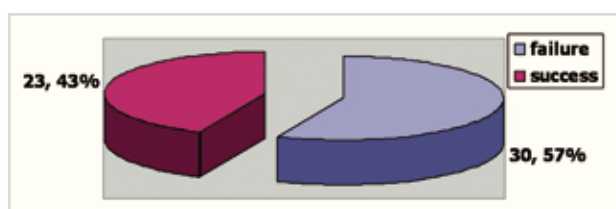
TABLE 1. Numbers of pregnant women in each gravida.

Gravida	Numbers of patient	Percent
First	15	28.3
Second	22	41.5
Third	13	24.5
Fourth	3	5.7
Total	53	100

of threatened preterm labour were found, they were treated according to their causes. If the cause could not be defined, inhibition of contractions with nifedipine were tried. Both loading and maintenance doses were used. The starting loading dose was with short acting nifedipine 20 mg. orally every 20 minutes for 3 times. Maintenance doses were continued with nifedipine sustained released (SR form) every 12 hours until 34 weeks of gestation. If a neonatal intensive care unit was not available, the inhibition of labour was prolonged until 36 weeks of gestation. If there was any complication with nifedipine, the inhibition of contraction was changed to be bricanyl intravenous form. If there were contraindications to use bricanyl, magnesium sulphate was used. Blood pressure and fetal heart rate monitoring were recorded during the inhibition. After detecting any complications including fetal bradycardia, severe maternal bradycardia and hypotension, the inhibition with nifedipine was stopped and replaced with bricanyl intravenously. However, bricanyl was the first line drug which was normally used in preterm labour at Siriraj Hospital.

RESULTS

During the period of 1st January to 31st October, 2007, a total of 53 pregnant women were admitted to the labour room, Siriraj Hospital with the diagnosis of threatened preterm labour. The patients' ages ranged from 16 to 43 years old with the mean age of 27.14 years old. The numbers of first, second, third and fourth gravids were 15, 22, 13 and 3 cases, respectively. (Table 1) The gestational age ranged from 28 to 35 weeks with the mean of 31.6 weeks of gestation. Failure of inhibition with nifedipine was found in 30 cases with complication of maternal hypotension (90/60 mmHg) for 7 cases and one case of fetal distress. 23 cases were successful for contraction inhibition with nifedipine. (Fig 1, Table 2) Those patients who failed to inhibit contraction with nifedipine, 28 cases continued to inhibit contraction with bricanyl and 2 with magnesium sulphate (due to placenta previa). (Fig 2) All were later successful to stop contraction with bricanyl and magnesium sulphate. Ten pregnant women underwent caesarean section, 31 cases of normal delivery, 3 cases of vacuum extraction, and 2 cases referred to other hospitals (normal delivery). (Table 3) Indications for cesarean section were shown in Table 4. 7

**Fig 1.** Numbers of patients with nifedipine uses.**TABLE 2.** The causes of failure inhibition with nifedipine.

The causes of failure inhibition	Numbers of patient	Percent
Maternal hypotension	7	23.3
Fetal distress	1	3.3
Unknown	22	73.4
Total	30	100

cases were not delivered. The gestational age at delivery ranged from 29 to 40 weeks of gestation with the mean gestational age of 37.7 weeks. The babies' weights ranged from 1,690 to 4,090 grams with the average body weight of 2,742 grams.

DISCUSSION

Preterm labour is still the big issue that causes high perinatal morbidity and mortality. The prevalence of preterm labour in Siriraj Hospital is about 6.7% which is very high.² Since Siriraj Hospital is the tertiary and referral center, the problems which we face is the high incidence of preterm birth. Terbutaline (bricanyl) is the first line drug which has been used intravenously or subcutaneously to inhibit preterm labour for 20 years.^{3,4} After successful inhibition with an intravenous form of bricanyl, the oral form of salbutamol was used continually until 34 weeks of gestation. However, the evidence recently supported that the oral form of salbutamol failed to inhibit contraction.⁵ Magnesium sulphate was still not approved by the FDA for inhibition contraction with the risk of fetal morbidity.⁶ Nifedipine was studied and strongly recommended to inhibit contraction.⁷ The side effects and complications of nifedipine to mother and fetus was fewer than beta-agonists and magnesium sulphate.⁷⁻⁹

The recent evidence from the statistics unit, Siriraj Hospital found that threatened preterm labour which was observed only without any medication turned to be preterm labour in about 25%.² Some cases were in advanced labour and underwent a delivery stage. Therefore nifedipine was interesting to study to inhibit contraction in case of threatened preterm labour. Even though many evidences suggested to do nothing with threatened preterm labour, nifedipine was still the only hopeful oral medication to use without any study for threatened preterm labour. Therefore nifedipine to inhibit threatened preterm labour was studied.

From the study, it has been found that nifedipine was successful to inhibit contraction in threatened preterm labour only 43%. Altogether 57% failed with mostly unknown causes and 23% of maternal hypotension and 1% of fetal distress. All of these cases

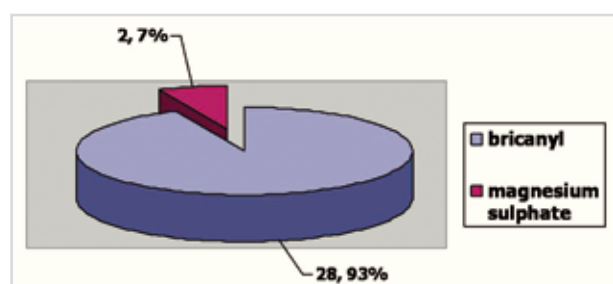
**Fig 2.** Numbers of patients who failed with nifedipine and continued with bricanyl and magnesium sulphate.

TABLE 3. Modes of delivery.

Modes of delivery	Numbers of patients	Percent
Normal labour	33	62.2
Vacuum extraction	3	5.7
Caesarean section	10	18.9
Still pregnant	7	13.2
Total	53	100

were successful to inhibit contraction with bricanyl and meagnesium sulphate. These can be explained by the fact that nifedipine failed to inhibit contraction in these cases. The study did not support the previous evidences that strongly recommended nifedipine for usage. Maternal hypotension occurred in only 23% of cases without evidence of fetal bradycardia which might make the physicians feel anxious and initially stop treatment. However, the study might suggest that threatened preterm labour can be only observed. More intervention might be unnecessary and result in higher cost.

This was a preliminary study which needs a bigger population and strong protocol in the preterm labour group, not in the threatened preterm labour group. Future study in the preterm labour group is in our plan to continue.

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TABLE 4. Indications for caesarean section.

Indication	Numbers of patients	Percent
Twins with unstable lies	2	20
Previous caesarean section	3	30
Placenta previa	1	10
Fetal distress	1	10
CPD	2	20
Breech presentation	1	10
Total	10	100

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