

# Management of Preterm Labour

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**Aims and Objectives of Study:** To compare the safety and efficacy of Ritodrine and Salbutamol in the management of preterm labour. **Study Design:** It was an interventional study in which the comparison between Salbutamol and Ritodrine was carried out for the prevention of preterm labour. **Study Setting:** Department of Obstetrics & Gynaecology, AIMC/Jinnah Hospital, Lahore. **Patients and methods:** 50 patients admitted for prevention of preterm labour were randomly assigned to two groups having 25 patients in each group. One group was given 100mg Ritodrine (group I) in 500ml of 5% Dextrose water, starting at a dose of 50µg/min and increased by 50µg/min every 15–30min till uterine activity ceased or dose of 350µg/min reached or other in tolerable side effects appeared. The effective tocolytic dose without side effects was maintained for 24 hours during this period steroid cover was given. Another group was given 5mg Salbutamol (group-II) in 500ml of 5% D/S, at a dose of 10µg/min to a maximum of 45µg/min until contraction ceased or side effects started. Continuous maternal and fetal monitoring was carried out in both groups. **Results:** Fifty patients presenting with preterm labour were studied. The maximum numbers of patients were in the age group of 30–34 years. Mean gestational age in group-I was 30.56weeks and group-II was 30.60weeks. 88% were with cephalic presentation, 8% had breech presentation and 4% presented with transverse lie in both groups. In group-I, 80% cases were < 32weeks of gestation and in group-II, 72% cases were <32 weeks of gestation. 52% in group-I and 56% in group-II were primigravida. Dilatation of the cervix at the time of first examination in group-I was 2cm in 22(88%) patients and 2–4cm in 3(12%) patients. In group-II 2cm in 20(80%) patients and 2–4cm in 5(20%) patients. The effacement of the cervix at the first examination was < 40% in 16 patients (64%), 40–50% in 6 (24%) patients and 60% in 3 (12%) patients in group-I and in group-II < 40% in 14 (56%) patients. 6(24%) patients 40–50% effacement and 5(20%) patients had 60% effacement. Successful tocolysis was achieved in 76% of the cases with Ritodrine hydrochloride (Group-I) and in 72% of the cases with Salbutamol (Group-II). The delay in the delivery for 48 hours, 7 days and till 36 weeks of gestation were 76%, 64% and 52% of patient respectively for Ritodrine and 72%, 56% and 40% respectively for Salbutamol. Headache, nausea and vomiting were complained in 6(24%), 2(8%) and 1(4%) patient in group-I and 4(16), 3(12%), and 2(8%) in group-II respectively. **Conclusion:** This study shows that Ritodrine hydrochloride and Salbutamol are equally effective regarding delay of delivery and prolongation of gestation.

**Keywords:** Preterm Labour, Pregnancy, Tocolysis, Tachycardia

Preterm labour is defined as labour occurring prior to 37 weeks of gestation<sup>1</sup>. Clinically it is difficult to diagnose women with true preterm labour. Creasy has proposed using the following criteria: uterine contractions and cervical dilatation and cervical effacement or uterine contractions and cervical changes<sup>2</sup>. A preterm infant is defined as one who is born at less than 259 days of pregnancy. The incidence of preterm labour is not available because of problems of definition, but is likely to be higher than that of spontaneous preterm delivery. Currently, it is estimated that 11.8% of the women deliver preterm<sup>3</sup>.

Pakistan has very high perinatal mortality rates in the world. The management of preterm labour continues to be a challenging problem. Medical, surgical and obstetrical complications of pregnancy are often responsible for premature birth. Many risk-scoring systems have been designed; all based on the epidemiological risk factors. In them the past reproductive history plays the major role with a history of previous preterm births, second trimester miscarriages and cone biopsy of cervix all scoring high<sup>4,5</sup>. Results give a sensitivity of only 40% and a false positive rate of almost 80%<sup>6</sup>.

It is believed that identification of women at risk of preterm birth will be beneficial if it allows women to receive a complete course of antenatal corticosteroids prior to delivery. Once preterm labour has started aggressive tocolytic therapy will afford the maximum chance for good perinatal outcome. Several controlled studies have shown the efficacy of tocolytic management. The role of Beta mimetics in inhibiting premature uterine contractions, successfully, is widely accepted.

The present study is designed to evaluate the management of preterm labour with two beta sympathomimetic drugs Ritodrine hydrochloride and Salbutamol.

## Patients and methods:

After admission a detailed history and physical examination was performed in order to establish the diagnosis of preterm labour. The patients were kept under observation for an hour. During this time an intravenous infusion of 5% dextrose solution was given slowly. The patients for study had continuous monitoring for foetal heart rate and uterine activity by cardiotocography. Intake and output record was maintained. Pulse and blood pressure were monitored.

Blood samples of all the patients were taken for grouping and Rh factor, Complete blood count, Serum electrolytes and blood sugar. Midstream specimen of urine for analysis, Ultrasound for gestational age, placental localization and ruling out IUGR, assessment of the foetal well being and placental localization was carried out. Patients selected for tocolysis after a detailed evaluation and bishop scoring (BS). Patients with BS more >6, medical disorders, fetal distress/anomalies, APH, PROM/chorio-amnionitis were excluded from the study.

Results of treatment were assessed separately as well as collectively. The success of (treatment) therapy was estimated by complete tocolysis on clinical and cardiocotographic examination.

**Results:**

Fifty patients presenting with preterm labour were studied. The maximum number of patients was in the age group of 30-34 years. Mean gestational age in group-I was 30.56weeks and group-II was 30.60weeks (Figure I). 88% were with cephalic presentation, 8% had breech presentation and 4% presented with transverse lie in both groups. In group-I, 80% cases were < 32weeks of gestation and in group-II, 72% cases were < 32 weeks of gestation (Figure II).

52% in group-I and 56% in group-II were primigravida (Figure III). Dilatation of the cervix at the time of first examination in group-I was 2cm in 22 (88%) patients and 2-4cm in 3(12%) patients. In group-II 2cm in 20(80%) patients and 2-4cm in 5(20%) patients. No patient included in the study was more than 4cm dilatation (Figure IV).

The effacement of the cervix at the first examination was < 40% in 16 patients (64%), 40-50% in 6 (24%) patients and 60% in 3 (12%) patients in group-I and in group-II < 40% in 14 (56%) patients, 6 (24%) patients 40-50% effacement and 5 (20%) patients had 60% effacement (Table I).

Successful tocolysis was achieved in 76% of the cases with Ritodrine hydrochloride (Group-I) and in 72% of the cases with Salbutamol (Group-II). The delay in the delivery for 48 hours, 7 days and till 36 weeks of gestation were 76%, 64% and 52% of patient respectively for Ritodrine and 72%, 56% and 40% respectively for Salbutamol (Figure V).

Headache, nausea and vomiting were complained in 6 (24%), 2 (8%) and 1 (4%) patient in group-I and 4 (16), 3 (12%), and 2 (8%) in group-II respectively (Figure VI). One patient (4%) treated with Salbutamol (Group-II) had supra-ventricular tachycardia, palpitation and treated with Inj. Verapamil. No case of pulmonary oedema, significant fetal heart rate changes noted. Fetal outcome was equivalent in both groups.

Figure I Distribution of Preterm Labour Patients

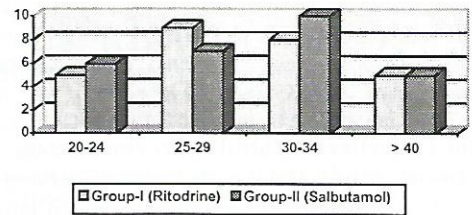


Figure II Gestational Age (Weeks at the time of preterm labour)

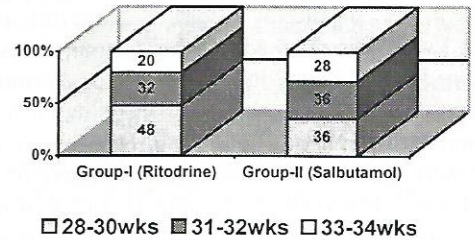


Figure III Relationship of Parity of the Patients with Preterm Labour

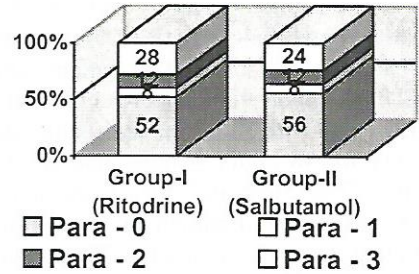


Figure IV: Dilatation of Cervix at the Time of First Examination

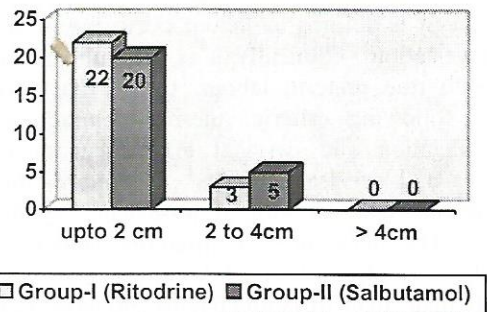


Figure V: Prolongation of Pregnancy with Tocolytic Therapy

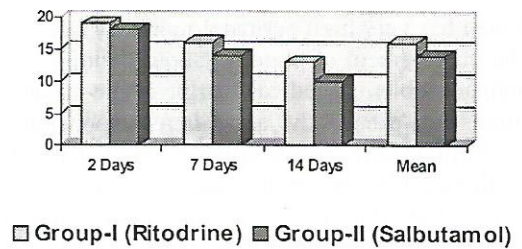


Figure VI: Side Effects Associated with Tocolytic Treatment

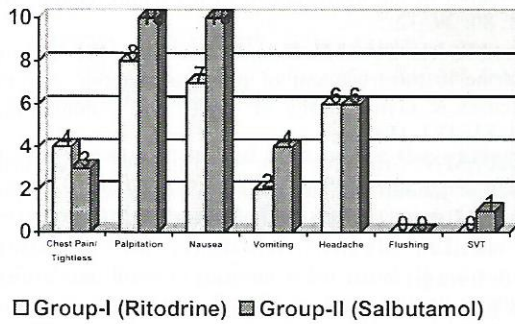


Table I: Effacement of the Cervix at the First Examination

%age Cervical Effacement	Group-I (Ritodrine)		Group-II (Salbutamol)	
	No.	%age	No.	%age
< 40%	16	64	14	56
40 - 50%	06	24	06	24
>60%	03	12	05	20

**Discussion:**

Several agents have been used as tocolytic agents to suppress uterine activity throughout the world. The prolongation of pregnancy for 48 hours would improve neonatal outcome by giving the antenatal cortico-steroid during the time gained.

The most widely used and extensively investigated agents for the management of preterm labour are beta sympathomimetics as first line tocolytic agents. Now a days magnesium sulphate is gaining popularity as a tocolytic agent of choice in United States although the exact mechanism action of is unknown<sup>8</sup>.

People are getting promising results from calcium channel blockers (Nifedepine) as a tocolytic agent but not very commonly used. Use of prostaglandin synthetase inhibitors (Indomethacin) as tocolytic agents is restricted because of fetal side effects. It is taken as third line agent in premature labour. Among the other tocolytic agents oxytocin analogues, atosiban is the most widely tested drug but is not approved by FDA for use in women with preterm labour because of its lack of evidence of improved neonatal outcome<sup>9</sup>.

Most of the patients with preterm labour were belonged to poor socioeconomic class as described in previous studies<sup>10</sup>. Highest numbers of patients were in the age range of 30-34 years, lowest in 35 years and above and no patient was below 20 years of age. This was in contrast to the study by Lumley 1993, which documented that increased risk of preterm delivery is in women less than 20 years of age and in women over 35 years of age.

The rate of preterm labour was highest in primipara in both the groups of patients as demonstrated by Bakketeig and Hoffman in their study in 1981<sup>11</sup>. As all the patients in this study were between 28 and 34 weeks of gestation. They were given injectable dexamethasone 12mg/12 hourly for 24 hours for foetal lung maturity to

avoid respiratory distress syndrome for better foetal outcome.

Success of tocolysis was defined as difference of labour for at least 48 hours. Successful tocolysis was achieved in 76% patients with Ritodrine hydrochloride and 72% with Salbutamol treatment. The success of uncontrolled studies of Salbutamol treatment by Dawson and Davies 1977<sup>12</sup>, Martin and McDavitt 1977<sup>13</sup>, and Liggins and Vaughan 1973<sup>14</sup> for 24 hours delay of pregnancy was 86%, 39.3% and 85% respectively.

The success of treatment with Ritodrine in uncontrolled study of Renaud et al 1974<sup>15</sup> for 24 hours was 87.5%. The controlled studies by Spellacy WN; Cruz AC; Birk SA, Buhi WC 1979<sup>16</sup>, Wesselius DE Casperis et al 1971<sup>17</sup> showed success of 26.6% and 77.1% respectively.

**Conclusion:**

This study shows that Ritodrine hydrochloride and Salbutamol are equally effective regarding delay of delivery and prolongation of gestation. Interventions, which have been shown to improve the neonatal outcome, can be instituted in the time gained. Ritodrine is well tolerated with less maternal side effects than Salbutamol. Unwanted effects of both drugs, if they occur, are seen mainly during intravenous administration, which can be controlled by adjusting the dose. Ritodrine was the first drug approved by F.D.A. for the management of Preterm Labour. In practice if the benefits of the therapy are explained to the women in terms of helping to save the life of her unborn child, it is likely that most women will be prepared to tolerate these discomforts.

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