RESEARCH PAPER

A Retrospective Case Series: Atosiban For Management Of Preterm Labour

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Abstract

Background: Preterm labor remains a leading cause of neonatal morbidity and mortality. Atosiban is an oxytocin receptor antagonist that offers tocolytic therapy with potentially fewer maternal cardiovascular side effects compared to traditional agents.

Objective:To evaluate the clinical effectiveness and safety profile of atosiban in the management of preterm labor in a diverse patient population.

Methods: Retrospective case series of 30 pregnant women presenting with preterm labor between 24-34 weeks gestation who received atosiban therapy for tocolysis at a tertiary care centre.

Results: Tocolysis was successful in prolonging pregnancy ≥48 hours in 24 patients (80%). Mean pregnancy prolongation was 18.3 days. Twenty-three patients (76.7%) delivered at ≥34 weeks of gestation. Minimal maternal side effects were observed. Neonatal outcomes were favourable with low rates of respiratory distress syndrome and intraventricular haemorrhage.

Conclusion: Atosiban demonstrated effectiveness in delaying preterm delivery with a favourable maternal safety profile in this case series.

Keywords: Atosiban, Preterm Labour, Maternal Outcome, Neonatal Outcome, Cardiovascular disease.

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Introduction

Preterm birth is defined as delivery before 37 weeks of gestation. It affects approximately 10% of pregnancies worldwide and it accounts for significant neonatal morbidity and mortality. Tocolytic agents are employed to delay delivery, allowing for the administration of corticosteroids for fetal lung maturation and maternal transfer to facilities with appropriate neonatal intensive care capabilities.

Atosiban is a synthetic nonapeptide oxytocin receptor antagonist that competitively binds to oxytocin receptors in the myometrium and decidua, thereby inhibiting uterine contractions. Unlike beta-agonists and calcium channel blockers, atosiban has minimal cardiovascular effects, making it particularly suitable for patients with cardiac contraindications to other tocolytics.

This case series examines the clinical outcomes of 30 consecutive patients treated with atosiban for preterm labor at our institution.

Methods

Study Design

It is a retrospective case series conducted at a tertiary care hospital with Level III NICU capabilities.

Patient Selection

Inclusion criteria:	Exclusion criteria:
Singleton or twin pregnancy	Gestational age <24 weeks or ≥34 weeks
Gestational age 24+0 to 34+0 weeks	Previous tocolytic therapy during the same pregnancy
Regular uterine contractions	Contraindications to tocolysis (severe preeclampsia,

	chorioamnionitis, fetal distress, significant antepartum hemorrhage, intrauterine fetal demise)
Cervical dilation 1-3 cm or cervical effacement ≥50%	
Intact or ruptured membranes	
Treatment with atosiban as the primary tocolytic agent	

Atosiban Protocol

Loading dose: 6.75 mg IV bolus over 1 minute
High-dose infusion: 300 µg/min for 3 hours
Low-dose infusion:100 µg/min for up to 45 hours
All patients received betamethasone 12 mg IM at 24-hour intervals (2 doses) for fetal lung maturation.

Data Collection

Medical records were collected for maternal demographics, obstetric history, gestational age at presentation and delivery, treatment details, maternal side effects, and neonatal outcomes.

Outcome:

Primary outcomes:

- Prolongation of pregnancy ≥48 hours
- Prolongation of pregnancy ≥7 days
- Delivery at ≥34 weeks of gestation

Secondary outcomes:

- Maternal adverse effects
- Neonatal outcomes (birthweight, Apgar scores, NICU admission, respiratory distress syndrome, intraventricular hemorrhage, neonatal death)

Results

Patient Demographics

Table : 1

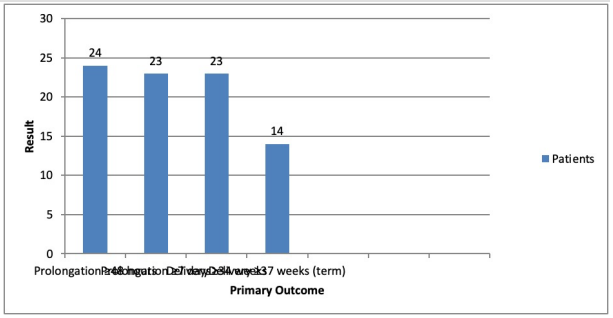
Characteristic	Value
Maternal age (years)	28.4 ± 5.2 (range: 19-39)
Nulliparous	12 (40.0%)
Twin pregnancy	4 (13.3%)
Previous preterm birth	8 (26.7%)
Gestational age at presentation (weeks)	30.2 ± 2.8 (range: 24+3 to 33+6)
Cervical dilation at presentation (cm)	2.1 ± 0.7

Treatment Outcomes

Primary Outcomes

Table : 2

Outcome	Result
Prolongation ≥48 hours	24/30 (80.0%)
Prolongation ≥7 days	23/30 (76.7%)
Delivery ≥34 weeks	23/30 (76.7%)
Delivery ≥37 weeks (term)	14/30 (46.7%)
Mean gestational age at delivery (weeks)	35.8 ± 2.4 (range: 30+2 to 39+0)



Treatment Failures

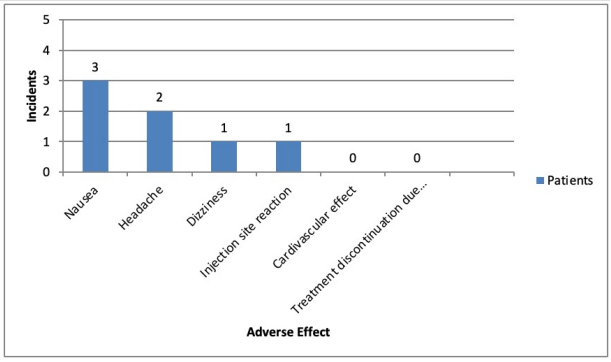
Six patients (20.0%) failed to achieve 48-hour pregnancy prolongation:

Maternal Safety Profile

Table : 3

Adverse Effect	Incidents
Nausea	3 (10%)
Headache	2 (6.7%)
Dizziness	1 (3.3%)
Injection site reaction	1 (3.3%)

Cardiovascular effect	0 (0%)
Treatment discontinuation due to side effect	0 (0%)

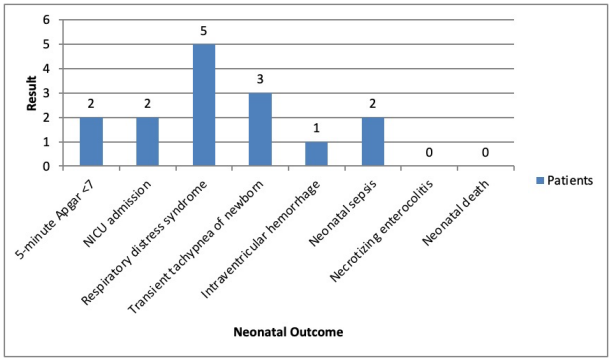


All adverse effects were mild and self-limiting. Discontinuation of Atosiban was not required for any patient.

Neonatal Outcomes

Table : 4

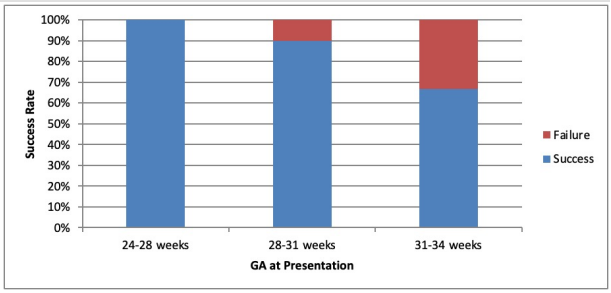
Outcome	Value
Mean birthweight (grams)	2,684 ± 518 (range: 1,450-3,820)
5-minute Apgar <7	2 (6.7%)
NICU admission	2 (6.7%)
Respiratory distress syndrome	5 (16.7%)
Transient tachypnea of newborn	3 (10.0%)
Intraventricular hemorrhage	1 (3.3%, Grade I)
Neonatal sepsis	2 (6.7%, both culture-negative)
Necrotizing enterocolitis	0 (0%)
Neonatal death	0 (0%)
Mean NICU stay (days, for those admitted)	8.3 ± 5.4



By Gestational Age at Presentation

Table : 5

GA at Presentation	n	Success Rate (>=48h)	Mean Prolongation (days)
24-28 weeks	5	5 (100%)	52± 10.8
28-31 weeks	10	9 (90%)	38.4 ± 18.2
31-34 weeks	15	10 (66.7%)	28.3 ± 14.6



Statistical observation: Earlier gestational age at treatment was associated with greater pregnancy prolongation ($p < 0.05$; correlation coefficient = -0.42).

Discussion

This case series demonstrates that atosiban is effective in delaying preterm delivery with a favorable maternal safety profile. Our success rate of 80% for achieving ≥48-hour pregnancy prolongation is consistent with published literature, which reports success rates ranging from 70-85%.

Effectiveness

The primary goal of tocolytic therapy is to delay delivery for 48 hours to allow for administration of antenatal corticosteroids and maternal transfer when necessary. In our series, 24 of 30 patients (80%) achieved this goal. Furthermore, 76.7% of patients delivered at ≥34 weeks gestation, which is associated

with significantly improved neonatal outcomes compared to earlier delivery.

It was noted that patients who presented at earlier gestational age achieved a higher rate of pregnancy prolongations.

Safety Profile: The maternal safety profile observed in this series was excellent. Unlike beta-agonists which is commonly associated with maternal tachycardia, palpitations and hyperglycemia, atosiban demonstrated minimal side effects. Only 3 patients experienced nausea, 2 had headaches, and 1 reported dizziness which are all mild and self-limiting. No cardiovascular adverse events occurred, making atosiban particularly suitable for patients with cardiac conditions or those in whom beta-agonists may be contraindicated.

Neonatal Outcomes

Neonatal outcomes were overall favorable. The rate of RDS is 16.7% which is lower than expected for this gestational age. It likely reflects the benefit of antenatal steroids facilitated by successful tocolysis.

Limitations

This case series has several limitations:

1. Retrospective design: Potential for selection bias
2. Inability to control confounding variables
3. Small sample size: Limited statistical power for subgroup analyses
4. Single-centeric study: May not be generalizable to other populations
5. No control group: Cannot directly compare to other tocolytic agents or expectant management
6. Short follow-up: Long-term neural development was not assessed

Clinical Implications

Atosiban appears to be an effective and safe option for the management of preterm labor. It is particularly suitable for :

- Patients with cardiovascular diseases
- Multiple Gestation
- Cases where beta-agonist side effects are poorly tolerated
- Preterm labor at an earlier gestational age where prolonged tocolysis may be beneficial

Comparison to Literature

Our findings align with several randomized controlled trials:

- The original multicenter European trials reported 48-hour delay rates of 82% with atosiban versus 78% with beta-agonists, with significantly fewer maternal side effects
- A 2014 Cochrane review found atosiban equally effective to other tocolytics with fewer adverse effects
- Meta-analyses consistently demonstrate atosiban's superior safety profile despite comparable efficacy

Conclusion

This case series of 30 patients demonstrates that atosiban is an effective tocolytic agent for management of preterm labor. We observed pregnancy prolongation in 80% of cases by >= 48 hours. We also observed a favorable maternal safety profile with minimal cardiovascular events. It was suitable for diverse patient populations, including those with comorbidities.

Neonatal outcomes were also favorable, with lower morbidity and no mortality. While this retrospective case series has inherent limitations but the findings do support the use of atosiban as a valuable option for tocolysis in the management of preterm labour. It is particularly useful when beta-agonists or calcium channel blockers are contraindicated or poorly tolerated.

Atosiban's mechanism of action: Targeting oxytocin receptors specifically, provides targeted tocolysis without the systemic side effects. Preterm birth are a major contributor to neonatal morbidity and mortality; effective and safe tocolytic options like atosiban remain an important component of obstetric care.

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