

Drugs used in obstetrics

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Drugs may be used to modify uterine contractions. These include oxytocic drugs used to stimulate uterine contractions both in induction of labour and to control postpartum haemorrhage and beta₂ -adrenoceptor agonists used to relax the uterus and prevent premature labour.

POSTPARTUM HAEMORRHAGE

Ergometrine and **oxytocin** differ in their actions on the uterus. In moderate doses oxytocin produces slow generalized contractions with full relaxation in between; ergometrine produces faster contractions superimposed on a tonic contraction. High doses of both substances produce sustained tonic contractions. Oxytocin is now recommended for routine use in postpartum and post-abortion haemorrhage since it is more stable than ergometrine. However, ergometrine may be used if oxytocin is not available or in emergency situations.

PREMATURE LABOUR

Salbutamol is a beta₂ -adrenoceptor agonist which relaxes the uterus and can be used to prevent premature labour in uncomplicated cases between 24 and 33 weeks of gestation. Its main purpose is to permit a delay in delivery of at least 48 hours. The greatest benefit is obtained by using this delay to administer corticosteroid therapy or to implement other measures known to improve perinatal health. Prolonged therapy should be avoided since the risks to the mother increase after 48 hours and the response of the myometrium is reduced.

ECLAMPSIA AND PRE-ECLAMPSIA

Magnesium sulfate has a major role in eclampsia for the prevention of recurrent seizures. Monitoring of blood pressure, respiratory rate and urinary output is carried out, as is monitoring for clinical signs of overdose (loss of patellar reflexes, weakness, nausea, sensation of warmth, flushing, double vision and slurred speech—calcium gluconate injection (section 27.2) is used for the management of magnesium toxicity).

Magnesium sulfate is also used in women with pre-eclampsia who are at risk of developing eclampsia; careful monitoring of the patient (as described above) is necessary.

Ergometrine maleate

Ergometrine is subject to international control under the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (1988)

Ergometrine is a representative oxytocic drug. Various drugs can serve as alternatives

Tablets, ergometrine maleate 200 micrograms

Injection (Solution for injection), ergometrine maleate 200 micrograms/ml, 1-ml ampoule

NOTE. Injection requires transport by 'cold chain' and refrigerated storage

Uses:

prevention and treatment of postpartum and post-abortion haemorrhage in emergency situations and where oxytocin not available

Contraindications:

induction of labour, first and second stages of labour; vascular disease, severe cardiac disease especially angina pectoris; severe hypertension; severe renal and hepatic impairment; sepsis; eclampsia

Precautions:

cardiac disease, hypertension, hepatic impairment (Appendix 5) and renal failure (Appendix 4), multiple pregnancy, porphyria; **interactions:** Appendix 1

Dosage:

Prevention and treatment of postpartum haemorrhage, when oxytocin is not available, *by intramuscular injection*, **ADULT** and **adolescent** 200 micrograms when the anterior shoulder is delivered or immediately after birth

Excessive uterine bleeding, *by slow intravenous injection*, **ADULT** and **adolescent** 250–500 micrograms when the anterior shoulder is delivered or immediately after birth

Secondary postpartum haemorrhage, *by mouth*, **ADULT** and **adolescent** 400 micrograms 3 times daily for 3 days

Adverse effects:

nausea, vomiting, headache, dizziness, tinnitus, abdominal pain, chest pain, palpitations, dyspnoea, bradycardia, transient hypertension, vasoconstriction; stroke, myocardial infarction and pulmonary oedema also reported

Magnesium sulfate

Injection (Solution for injection), magnesium sulfate 500 mg/ml, 2-ml ampoule, 10-ml ampoule

Uses:

prevention of recurrent seizures in eclampsia; prevention of seizures in pre-eclampsia

Precautions:

hepatic impairment (Appendix 5); renal failure (Appendix 4); in severe hypomagnesaemia administer initially via a controlled infusion device; **interactions:** Appendix 1

Dosage:

Prevention of recurrent seizures in eclampsia, *by intravenous injection*, **ADULT and adolescent** initially 4 g over 5–15 minutes followed *either by intravenous infusion*, 1 g/hour for at least 24 hours after the last seizure *or by deep intramuscular injection* 5 g into each buttock then 5 g every 4 hours into alternate buttocks for at least 24 hours after the last seizure; recurrence of seizures may require additional *intravenous injection* of 2 g

Prevention of seizures in pre-eclampsia, *by intravenous infusion*, **adult and adolescent** initially 4 g over 5–15 minutes followed *either by intravenous infusion*, 1 g/hour for 24 hours *or by deep intramuscular injection* 5 g into each buttock then 5 g every 4 hours into alternate buttocks for 24 hours; if seizure occurs, additional dose *by intravenous injection* of 2 g

DILUTION AND ADMINISTRATION.

According to manufacturer's directions

For *intravenous injection* concentration of magnesium sulfate should not exceed 20% (dilute 1 part of magnesium sulfate injection 50% with at least 1.5 parts of water for injection); for *intramuscular injection*, mix magnesium sulfate injection 50% with 1 ml lidocaine injection 2%

Adverse effects:

generally associated with hypermagnesaemia (see also notes above), nausea, vomiting, thirst, flushing of skin, hypotension, arrhythmias, coma, respiratory depression, drowsiness, confusion, loss of tendon reflexes, muscle weakness; see also Appendix 2

Oxytocin

Injection (Solution for injection), oxytocin 10 units/ml, 1-ml ampoule

Uses:

routine prevention and treatment of postpartum and post-abortion haemorrhage; induction of labour

Contraindications:

hypertonic uterine contractions, mechanical obstruction to delivery, fetal distress; any condition where spontaneous labour or vaginal delivery inadvisable; avoid prolonged administration in oxytocin-resistant uterine inertia, in severe pre-eclamptic toxemia or in severe cardiovascular disease

Precautions:

induction or enhancement of labour in presence of borderline cephalopelvic disproportion (avoid if significant); mild to moderate pregnancy-associated hypertension or cardiac disease; age over 35 years; history of low-uterine segment caesarean section; avoid tumultuous labour if fetal death or meconium-stained amniotic fluid (risk of amniotic fluid embolism); water intoxication and hyponatraemia (avoid large volume infusions and restrict fluid intake); caudal block anaesthesia (risk of severe hypertension due to enhanced vasopressor effect of sympathomimetics); **interactions:** Appendix 1

Dosage:

Induction of labour, *by intravenous infusion*, **ADULT** and **adolescent**, initially 0.001–0.002 units/minute increased in 0.001–0.002 units/minute increments at intervals of 30 minutes until a maximum of 3–4 contractions occur every 10 minutes; maximum recommended rate 0.02 units/minute; no more than 5 units should be administered in 24 hours

NOTE. The dose shown above is suitable for use in hospital where equipment to control the infusion rate is available; alternative recommendations may be suitable for other settings (consult *Managing Complications in Pregnancy and Childbirth : A guide for midwives and doctors 2003* . Geneva: WHO)

IMPORTANT. Careful monitoring of fetal heart rate and uterine motility essential for dose titration (never give intravenous bolus injection during labour); discontinue immediately in uterine hyperactivity or fetal distress

Prevention of postpartum haemorrhage, *by slow intravenous injection*, **ADULT** and **adolescent** 5 units when the anterior shoulder is delivered or immediately after birth

Prevention of postpartum haemorrhage, *by intramuscular injection*, **adult** and **adolescent** 10 units when the anterior shoulder is delivered or immediately after birth

Treatment of postpartum haemorrhage, *by slow intravenous injection*, **adult** and **adolescent** 5–10 units *or by intramuscular injection*, 10 units, followed in severe cases *by intravenous infusion*, a total of 40 units should be infused at a rate of 0.02–0.04 units/minute; this should be started after the placenta is delivered

DILUTION AND ADMINISTRATION. According to manufacturer's directions. Prolonged intravenous administration at high doses with large volume of fluid (for example in inevitable or missed abortion or postpartum haemorrhage) may cause water intoxication with hyponatraemia. To avoid: use electrolyte-containing diluent (not glucose), increase oxytocin concentration to reduce fluid, restrict fluid intake by mouth; monitor fluid and electrolytes

Adverse effects:

uterine spasm, uterine hyperstimulation (usually with excessive doses—may cause fetal distress, asphyxia and death, or may lead to hypertonicity, tetanic contractions, soft-tissue damage or uterine rupture); water intoxication and hyponatraemia

associated with high doses and large-volume infusions; nausea, vomiting, arrhythmias, rashes and anaphylactoid reactions also reported

Salbutamol

Salbutamol is a representative myometrial relaxant. Various drugs can serve as alternatives

Tablets , salbutamol (as sulfate) 4 mg

Injection (Solution for injection), salbutamol (as sulfate) 50 micrograms/ml, 5-ml ampoule

Uses:

uncomplicated premature labour between 24–33 weeks gestation; asthma (section 25.1)

Contraindications:

first and second trimester of pregnancy; cardiac disease, eclampsia and pre-eclampsia, intra-uterine infection, intra-uterine fetal death, antepartum haemorrhage, placenta praevia, cord compression, ruptured membranes

Precautions:

monitor pulse and blood pressure and avoid over-hydration; suspected cardiac disease, hypertension, hyperthyroidism, hypokalaemia, diabetes mellitus; if pulmonary oedema suspected, discontinue immediately and institute diuretic therapy;

interactions : Appendix 1

Dosage:

Premature labour, *by intravenous infusion* , **ADULT** initially 10 micrograms/minute, rate gradually increased according to response at 10-minute intervals until contractions diminish then increase rate (maximum of 45 micrograms/minute) until contractions have ceased, maintain rate for 1 hour then gradually reduce; *or by intravenous or intramuscular injection* , **ADULT** 100–250 micrograms repeated according to response, then *by mouth* , 4 mg every 6–8 hours (use for more than 48 hours not recommended)

Adverse effects:

nausea, vomiting, flushing, sweating, tremor; hypokalaemia, tachycardia, palpitations, and hypotension, increased tendency to uterine bleeding; pulmonary oedema; chest pain or tightness and arrhythmias; hypersensitivity reactions including bronchospasm, urticaria and angioedema reported