ESSENTIAL DRUGS FOR MATERNAL HEALTH
FREQUENTLY ASKED QUESTIONS

OXYTOCIN

What is Oxytocin?

It is a hormone that is produced naturally in the body by the pituitary gland and it is available in the synthetic form as an injection (brand names Pitocin and Syntocinon). It causes contractions during labour and the secretion of breast milk post delivery.

How does it act?

During pregnancy and childbirth

Towards the end of pregnancy oxytocin is produced in the body to help labour. It causes cervical dilatation (opening up of the mouth of the uterus) by exerting a selective action on the muscles of the uterus, and stimulates contractions, gradually increasing their frequency and strength, so that they become strong enough for the baby to be born.

After delivery

After delivery, oxytocin helps the mother and baby in two ways – firstly it helps in the secretion of breast milk ('let down reflex'), and secondly it helps the uterus to contract.

After the birth, during the first weeks of breastfeeding, suckling by the infant at the nipple helps the secretion of oxytocin from the pituitary gland of the mother; the more suckling by the baby – the more oxytocin is produced. The mother's oxytocin causes mild but often painful contractions in the uterus. This contracting of the uterus helps in the reduction of post delivery bleeding.

Why are injections of oxytocin used?

Normally the body produces enough oxytocin for the delivery of the baby. Sometimes the synthetically produced oxytocin is used to start or help labour. It can help to coordinate and strengthen the uterine contractions. It needs to be carefully measured and used in the appropriate dilution, and given at the appropriate rate, since it is a very powerful drug. It is also used after the delivery for the prevention and treatment of bleeding.

WARNING

Oxytocin injections, when used inappropriately, can cause problems to the mother including tears in the uterus and deprive oxygen supply to the baby. When used during labour for induction or augmentation, oxytocin must be administered under medical supervision only. It must always be used in such cases as an intravenous infusion (drip) and never intramuscularly.

During delivery

Oxytocin injections are used for

1. "induction of labour" (to start contractions of childbirth) when delivery is in the best interests of mother and fetus, for example when membranes have ruptured.

2. "augmentation of labour" (to increase contractions of childbirth), for example when the contractions of the uterus are not strong enough.
3. helping in the management of incomplete or inevitable abortion. In the first trimester, emptying the uterus through a minor surgical procedure like vacuum aspiration or curettage (D & C) is generally considered primary therapy. In second trimester abortion, oxytocin infusion will often be successful in emptying the uterus.

Postpartum

Oxytocin helps to produce uterine contractions after the delivery of the baby, which helps to expel the placenta. This helps prevent postpartum bleeding or haemorrhage.

When should it NOT be used?

Oxytocin should not be used in any of the following conditions

- The head of the baby is too big for the mother's pelvis (cephalopelvic disproportion)
- The position of the baby is not favourable
- The baby is lying horizontally (transverse lie)
- When surgical delivery (caesarean section) would be better for mother and baby
- When the baby is having problems and delivery is not likely in the next few hours
- When the uterine contractions are already so powerful and frequent that they are of concern both for the mother and the baby (hypertonic uterine patterns)
- Prolonged use when the uterus fails to contract
- Where vaginal delivery is not possible, for example when the cord comes first (cord presentation or prolapse), or when there is heavy bleeding before delivery due to the placenta covering the cervix (placenta praevia)

Drug treatment protocol

A. Use during labour

WARNING

Oxytocin should be given cautiously to women who have had several previous deliveries, and women with previous caesarean sections. It can cause the uterus to rupture. It should never be given to any woman outside a hospital setting. If oxytocin fails to deliver the baby, caesarean section will probably have to be performed.

To start or increase the contractions for delivery

1. IV fluids should be started with normal saline or Ringer's lactate.
2. To prepare the usual solution for infusion, add half ampoule of Oxytocin Injection (0.5ml or 2.5 Units) to 500 ml of IV fluid.
3. The initial dose should be no more than 10 drops per minute, and gradually increased until good contractions are achieved (3 contractions in 10 minutes, lasting for 30-40 seconds each). If the

contractions last more than 60 seconds, or there are more than 4 in a minute, stop the IV. The uterus needs to relax between each contraction.

4. The foetal heart rate should be monitored every 15 minutes, just after a contraction. If the foetal heart rate is less than 100 per minute, the IV should be stopped.

B. Control of postpartum uterine bleeding

1. Intravenous infusion (drip method)

   To control postpartum bleeding, add 20 units (IU) of oxytocin (or 4 ampoules of 1ml each) to 500 ml IV fluid (Ringer's Lactate or normal saline) and run at 60 drops per minute. 2 such bottles should be given, then continue at 40 drops per minute, until bleeding is controlled.

2. Intramuscular administration

   Injection of 10 units (IU) of oxytocin (or 2 ampoules of 1ml each) can be given IM after the delivery of the baby. This can also be given to prevent bleeding after the birth.

   If this does not control the bleeding, further treatment including blood transfusion may be needed.

NOTE

Oxytocin is available only as an injection. It can lose potency at high temperatures and is therefore best stored in a refrigerator.

MAGNESIUM SULPHATE

What is magnesium sulphate (magsulph)?

It is used mainly for the prevention and treatment of eclampsia convulsions (fits) in a woman with pre eclampsia.

What is pre eclampsia / eclampsia?

Pre eclampsia is a condition in which the blood pressure increases during pregnancy and there is loss of protein through the urine. It is often accompanied by swelling of feet, hands and face. It usually occurs after 20 weeks pregnancy. In severe cases the woman can have convulsions (fits) and this is called eclampsia. These fits are often preceded by severe headache, vomiting, blurred vision and severe abdominal pain - these are signs that fits are imminent, otherwise called imminent eclampsia. These convulsions are very dangerous and can result in serious complications including death for both the pregnant woman and the foetus. In fact, pre eclampsia and eclampsia account for 5% of maternal deaths in India.

How does magnesium sulphate work?

How magnesium sulphate prevents convulsions in eclampsia is not clear. Eclampsia is thought to occur as a result of decreased blood flow to the brain caused by contraction of blood vessels in the brain. Magnesium sulphate dilates these blood vessels and is thus thought to prevent / treat convulsions.

Why is it used?

Delivery is the only cure for pre eclampsia or eclampsia. The decision on whether to deliver the woman is usually made based on the gestational age of the pregnancy and the severity of the pre eclampsia. The primary objective is the safety of the mother and then the delivery of a healthy baby. In case the preeclampsia is severe (diastolic or lower blood pressure of 110 mm Hg or more and 3+ protein in the urine) or eclampsia occurs or is imminent, then management usually consists of three components performed simultaneously.

1. Control of seizures
2. Control of blood pressure
3. Delivery of the baby

Of these, magnesium sulfate is the first-line treatment for the prevention and treatment of eclamptic seizures.

Drug treatment protocol

Magnesium sulphate is usually given either through intravenous infusion or intramuscularly as an initial loading dose followed by maintenance doses. The intramuscular regimen is usually used in India. This is usually given as an initial loading dose that consists of 4 gms of a 20% solution given intravenously and 10 gms of 50% solution given intramuscularly, 5 gms in each buttock. This is followed by 5 gms given intramuscularly every 4 hours as a maintenance dose.

The guidelines by the Government of India for skilled birth attendance mention that auxiliary nurse midwives (ANMs) should give the initial loading dose of magnesium sulphate of 10 gms intramuscularly in a woman with eclampsia and then refer her to a First Referral Unit (FRU).

Side effects

Magnesium sulphate can rarely result in toxicity for the mother and therefore its administration has to be carefully monitored. This is usually done by monitoring for the presence of patellar reflex (knee jerk elicited by tapping just below the knee with a knee hammer), urine output and respiratory rate. Careful attention to the monitoring guidelines can prevent toxicity.

Calcium gluconate is the drug used to counteract the toxicity of magnesium sulphate and must always be stored in the labour room. Its dosage is 1 gm (10ml of a 10% solution) given intravenously slowly.

MISOPROSTOL

What is misoprostol?

It is a drug that mimics the action of a natural chemical in the body called prostaglandin E1 (PGE 1) and acts on the cervix (mouth of the uterus) and uterus of a pregnant woman. It is available also as a medication for the treatment of stomach ulcers.

How does it act?

Misoprostol acts on the uterus and stimulates contractions. It also acts on the cervix to soften it and open it up.

In what forms is it available and used?

Misoprostol is available as tablets. In India, it is available in the following strengths: 25 microgram (mcg) tablets, 100 mcg tablets and 200 mcg tablets. It is also available as a combination package with another drug named mifepristone.

Some of the advantages of misoprostol are that it is relatively inexpensive and can be stored at room temperature. It can also be used through several routes - orally, vaginally, buccally (inside the cheek), sublingually (under the tongue) and rectally.

Why is it used?

Misoprostol can be used for several reasons during pregnancy and childbirth.

1. During early pregnancy

- Medical abortion: It can be used along with another drug called mifepristone in the first trimester for terminating a pregnancy (Medical Abortion). The Medical Termination of Pregnancy Act in India allows its use for this reason upto 49 days of pregnancy.
- Missed abortion: In cases of a missed miscarriage, it can be used to evacuate the uterus.

2. During late pregnancy

- Induction of labour: It is used to start contractions of childbirth when delivery is in the best interests of mother and foetus.

WARNING

- ***Induction of labour with misoprostol must be done under strict medical supervision in a hospital setting.***
- ***Misoprostol can stimulate very strong uterine contractions and can cause damage to the uterus including rupture of the uterus and foetal death if used inappropriately.***
- ***It should not be used for labour induction in a woman with a scarred uterus, eg. a previous caesarean section.***

Termination of pregnancy in women with an abnormal foetus or when the foetus has died inside the uterus: In such circumstances, misoprostol can be used to start contractions in order to deliver the foetus.

3. After childbirth

- Prevention of postpartum haemorrhage : Misoprostol when given immediately after the birth of the baby reduces the chances of excessive bleeding after delivery by promoting uterine contraction and delivery of the placenta. While oxytocin is more effective than misoprostol for this purpose, it has to be administered as an injection needing a skilled person and also needs to be refrigerated. Since misoprostol is a tablet that is stable at room temperatures, it is recommended for use in situations where oxytocin cannot be used.
- Treatment of postpartum haemorrhage : Misoprostol is also used in the treatment of excessive bleeding after childbirth in situations where oxytocin cannot be used.

What are the treatment protocols for use of misoprostol?

Misoprostol is recommended in different dosages and routes for different indications. The following table summarizes these.

Sr. No.	Indication	Dosage and route	Remarks
1	Medical abortion	800 mcg vaginally or inside the cheek or under the tongue	To be used 24 to 48 hours after taking Mifepristone 200 mg orally
2	Missed miscarriage	800 mcg vaginally or 600 mcg under the tongue as a single dose	May be repeated after 3 hours if necessary
3	Induction of labour	25 mcg orally every 2 hours or 25 mcg vaginally every 6 hours	Not to be used in a woman with a previous caesarean section
4	Termination of pregnancy in women with an abnormal foetus or when the foetus has died inside the uterus (after 28 weeks)	25 mcg orally every 2 hours or 25 mcg vaginally every 6 hours	Not to be used in a woman with a previous caesarean section
5	Prevention of PPH	600 mcg orally as a single dose	To be given within one minute of the delivery of the baby. This dosage can also be given rectally or under the tongue.
6	Treatment of PPH	600 mcg orally or under the tongue	This dosage can also be given rectally.

What are the side effects of misoprostol?

Misoprostol can cause shivering, fever, nausea, vomiting and diarrhoea as side effects. These side effects are usually more common when it is taken orally rather than vaginally, under the tongue or inside the cheek. These side effects are usually self limiting and require only symptomatic treatment.

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