ABC of labour care

Induction

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Labour is induced when an external agent is used to stimulate delivery before the onset of spontaneous labour. Induction must be distinguished clearly from augmentation of labour: both use similar techniques, but the first aims to start labour, whereas the second enhances uterine contractions once labour has started.

Incidence

No statutory national data are collected on the incidence of induction. The National Birthday Trust's study on home births in 1994 showed a 19% induction rate among a normal group of women who planned to deliver in hospital compared with 0.2% in those who delivered at home. Hospital reports, where published, vary from 0% to 30%.

Indications

There are few absolute indications for inducing labour, and priorities vary with the obstetrician. Postmaturity (when the pregnancy extends well beyond the expected delivery date) still heads the list, followed by suspected fetal growth retardation and maternal hypertension. Social factors—such as the woman's own wishes—play a larger part these days.

In a meta-analysis of 10 randomised controlled trials comparing induction at 41-42 weeks with conservative treatment, Crowley showed the increased risk of perinatal deaths associated with prolonged pregnancy. The risk is reduced by induction at 41 weeks (Cochrane Collaboration).

A non-medical indication for induction is the woman's own wishes. Many mothers exceeding their expected delivery date by a week consider that their pregnancy has gone far enough and ask for induction. Roberts and Young found that about 70% of women expressed the wish to be induced after 41 weeks. Provided that the cervix is ripe, many obstetricians would agree with this choice and use a non-invasive method—for example, prostaglandins.

Maternal age and poor obstetric history are relative indications, but it should be remembered that induction is intended to result in a birth. Hence, if a vaginal delivery does not follow, a caesarean section may be required. If the grounds for induction are not strong, this could lead to a caesarean section for a poor indication.

Rarely, a planned time of delivery may be needed to provide the best care for the fetus. Some cardiac abnormalities may require immediate surgery after birth. Labour should be induced at a tertiary referral centre, with the facilities for neonatal surgery ready.

Readiness for induction

Before the obstetrician decides on induction and before he or she discusses the possibility with the woman, the uterus needs to be checked as ready for labour. This is best assessed by examining the lie and position of the fetus, the volume of amniotic fluid, the tone of the uterus, and the ripeness of the

Induction is the stimulation of the uterus with the aim of starting labour to ensure delivery of the fetus at an appropriate time when the baby is thought to be safer outside the uterus than in it

Induction and augmentation

- Induction means starting labour
- Augmentation means enhancing a labour that has already started

Percentage of inductions performed in hospitals or trusts in England

Major indications for induction of labour reported for England and Wales (1994-5) and percentage of women with such problems who were induced

	% of women who were induced
Prolonged pregnancy	70
Hypertension and pre-eclampsia	51
Malposition or malpresentation of fetus	13
Pelvic abnormality	11

Preventing various outcomes in postpartum delivery by routine v selective induction of labour

cervix, the last being the best predictor. Some of these clinical signs have been scored by Bishop (1964), to predict cervical assessment and the likelihood of the induction being successful.

If the score exceeds 8, the chance of a successful delivery after induction is the same as that following a spontaneous onset of labour. As with many scoring systems, the Bishop's score provides only a guide. A modest correlation exists between cervical ripeness and the likelihood of success. The Bishop's score only translates into numbers what the experienced clinician learns when examining the cervix for ripeness.

When planning an induction, the obstetrician should discuss the procedure fully with the woman, explaining the method to be used, any side effects, and the sequelae if it fails. She should give her informed consent to the procedure. It may be advisable for this to be in writing; if it is not, a note should be made by the doctor in the woman's records and signed.

Contraindications

Contraindications to induction are the same as contraindications to a vaginal delivery. A few are absolute (a severe degree of placenta praevia or a transverse fetal lie); others are relative, such as active primary genital herpes infection, or a high and floating fetal head as cord prolapse could follow.

Contraindications to induction

- Severe cephalopelvic disproportion
- Severe degree of placenta praevia
- Oblique or transverse lie
- Cervix <4 on the Bishop's score*

*This contraindication may be overcome by ripening the cervix with prostaglandins and then proceeding to induction

Methods of induction

Fetal maturity should first be assessed. The presentation and position of the fetus should be rechecked just before induction.

The simplest procedure is to sweep the membranes with a gloved finger lubricated with antiseptic cream and inserted gently up the cervical canal. If performed by an experienced doctor or midwife, this need not be uncomfortable. After 40 weeks' gestation, this procedure can halve the subsequent need for further induction, but at 38-40 weeks it does not significantly increase the proportion of women who go into labour within 7 days.

The traditional method of induction is to rupture the membranes, releasing amniotic fluid. The forewaters can be snagged with a simple Amnihook (EMS Medical Group), a pair of Kocher's forceps, or a pair of special amniotomy forceps. Under sterile conditions the chosen instrument is passed through the cervical canal. Under vision or digital pilotage, the forewaters are snagged. The colour of the amniotic fluid and the volume released should be assessed. The fetal heart rate should be checked immediately afterwards to ensure no fetal compromise, but it is unnecessary to continue with cardiotocography unless there is a specific indication.

Puncture of the hindwaters used to be done with a Drew Smythe catheter, an S shaped metal catheter. Although not often performed in Britain these days, this procedure is still useful in many parts of the world where access to caesarean section may be difficult. It is used for inducing a woman with an

Ripeness of cervix

A ripe cervix shows that a uterus is ready for labour when it is:

- Soft
- Taken up
- Dilated
- Central on the presenting part

Bishop's score used to assess cervical ripeness

Ripeness	0	1	2	3
Cervical length (cm)	> 2	1 or 2	< 1	Fully taken up
Cervical dilatation (cm)	0	1 or 2	3 or 4	≥5
Cervical consistency	Firm	Medium	Soft	NA
Position of cervix	Posterior	Central	Anterior	NA
Station of presenting part (cm above ischial spines)	3	2	1 or 0	Below ischial spines

Methods of induction used in England and Wales in 1994-5

Top: pair of amniotomy forceps. Bottom: an Amnihook—plastic disposable hooked instrument

unstable lie when the fetal head is wandering out of the pelvis and needs to be stabilised.

Artificial rupture of membranes by snagging at forewaters

Prostaglandins

The commonest method of induction in current use in the United Kingdom is with prostaglandin gel or pessaries placed high in the vagina. These hormones are the same as those produced by the uterus in early labour, so it is a more natural method than using oxytocic agents. Also, cells that have been primed with prostaglandin gel are more likely to respond if intravenous oxytocin is needed.

Prostaglandins can be given intravenously, intramuscularly, orally, or vaginally, but the first three routes often produce severe side effects and are best avoided in labour. Currently, in Britain, 1 mg or 2 mg of prostaglandin E_{2a} is given in a gel. It is absorbed into the circulation through the vaginal and cervical epithelium, returning in the blood supply to the uterus. An obstetrician or midwife starting an induction with prostaglandin gel should stay with the woman for 20-30 minutes in case of a myometrial overreaction, and cardiotocography monitoring of the fetus is wise.

If labour is not established and the cervix is not dilating after four to six hours, the same dose of prostaglandin gel may be repeated. After this, most obstetricians would advise a low rupture of the membranes if the cervix was sufficiently dilated, usually with Syntocinon intravenously. Such a mixture should be handled with care, with a midwife constantly in attendance to observe the strength of the uterine contractions.

Syntocinon

This synthetically produced oxytocic is given intravenously, with the dose titred against the myometrial response. For safety reasons either a very dilute solution is used or a mechanical pump is preset to inject small amounts of the concentrated agent into a dextrose saline drip. Rarely is Syntocinon used alone to induce labour; its help is more to augment existing labour after the artificial rupture of the membranes or stimulation with prostaglandin gel.

Success of induction

Insertion of prostaglandin gel into the vagina is probably the most successful method of induction overall, effective in over 90% of women. A combination of artificial rupture of the membranes and Syntocinon succeeds in 95% of women who are induced with a ripe cervix.

Failure to induce labour after correct administration of adequate doses should make the obstetrician rethink whether induction is really appropriate. If delivery is still indicated, should a caesarean section be performed? If the indications are borderline, is it possible to postpone induction for a day or so?

Pair of Kocher's forceps—with toothed jaws at end

Inserting prostaglandin gel into upper vagina

Micropump for pumping safe amounts of oxytocic drugs into intravenous line

This can most readily be done if the membranes have not been ruptured. Such action may cause psychological reactions and the woman needs careful counselling.

Risks of induction

Induction may fail and lead to the need for caesarean section.

Uterine hyperstimulation can follow induction with Syntocinon or prostaglandin gel and lead to fetal distress, causing hypoxic damage to the baby.

Multiparous women should be induced carefully as they have an increased risk of uterine rupture. Treatment is with tocolytics and, if the problem persists, immediate operative delivery.

Prolonged membrane rupture without delivery can result in intrauterine infection. This is less likely if labour follows within 12 hours.

If the presenting part is not well engaged, a prolapsed cord may occur with the first rush of amniotic fluid.

The risk of amniotic fluid embolism is increased.

Rarely, induction might precipitate delivery of an unexpectedly preterm infant. With ultrasound scanning in early pregnancy, this is rare.

After induction the risk of operative vaginal delivery is increased 1.5-fold and that of caesarean section is increased 1.8-fold. This may well be due to the condition indicating induction.

Conclusions

Induction of labour is a powerful tool in obstetric management. It should be used only when the benefits to fetus or mother of the baby outweigh those of the pregnancy continuing. When induction is used, there should be sound indications and a reasonable chance that it will succeed. Using prostaglandins on their own is probably the most useful overall method.

The second graph on the first page is adapted from Crowley (*Cochrane Library*, 1998). The pie chart is adapted from the *Statistical Bulletin: NHS Maternity Statistics* (Department of Health, 1997).

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The ABC of Labour Care is edited by Geoffrey Chamberlain, emeritus professor of obstetrics and gynaecology at the Singleton Hospital, Swansea. It will be published as a book in the summer.

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Algorithm of failed induction; all decisions depend on need for induction

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One hundred years ago

The Royal Academy Exhibition

No previous Academy in our recollection has been so devoid as this of any points of interest from the purely medical point of view. Only one picture—by Mr. Chevallier Taylor—affords the faintest suggestion of a text from which a clinical or pathological sermon can be preached; and here we have merely a commonplace husband sitting by the bedside of his wife, under the title of "In Sickness and in Health." But whether the patient is convalescent or holding her own, or drifting onwards to the unknown shore, the catalogue cannot tell us, and our imagination has not yet reached a diagnosis. Although the sentiment is sound and the brush work firm and suggestive, we

hardly think that it will awaken any general interest, or rival even in a minor degree "The Doctor," whom Fildes painted years ago with such loving skill. Goodall, who now seems firmly established as the ophthalmic artist laureate, contributes a striking portrait of Mr. Juler, and Sant reminds old friends of the genial face of Henry Lee seen at his best in profile, and in his habit as he must have lived thirty or forty years ago. This is really all that a careful study of the Burlington House show for 1899 can furnish us in any way worthy of record from the only point of view from which we are entitled to speak with critical authority. (*BMJ* 1899;i:1117)