Inducing labour with vaginally administered prostaglandin E$_2$

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In 50 consecutive pregnant women at a 125-bed community hospital with 1000 deliveries annually, labour was induced with prostaglandin E$_2$ administered intravaginally. There were no stillbirths or neonatal deaths, and complications in the mothers were few. In nine women (18%) oxytocin was subsequently administered because of a failure of labour to progress; in spite of this, cesarean section was required in two (4%) of the patients. The overall cesarean section rate was 6%.

Prostaglandins have been used routinely to induce labour in the United Kingdom for several years. This noninvasive method is safe, effective and well received by women in a community hospital setting, including those wanting "natural childbirth".

Dans un hôpital local de 125 lits avec 1000 accouchements annuellement, on a utilisé, chez 50 femmes enceintes consécutives, l'administration intra-vaginale de prostaglandine E$_2$ pour provoquer le travail. La mortalité et la mortalité néonatale sont nulles, et peu de complications maternelles ont été notées. Chez neuf femmes (18%), un arrêt du travail a nécessité par la suite l'emploi de l'oxytocine; chez deux de celles-ci on a dû malgré tout recourir à la césarienne. Le taux de césarienne pour l'ensemble de ces mères est de 6%.

L'emploi des prostaglandines pour la provocation du travail est courant au Royaume-Uni depuis plusieurs années. C'est une méthode non envahissante efficace et sûre. Elle plait aux mères qui accouchent dans un hôpital local, y compris celles qui tiennent à avoir un "accouchement naturel".

The induction of labour is an important part of modern obstetric practice. The frequency of induction varies enormously from one obstetric unit to another; some have even advocated routine induction at term to further reduce perinatal mortality. Since the work of Turnbull and Anderson in 1968 oxytocin infusion combined with amniotomy has been the standard mode of induction. This method may result in more painful labour and requires that the patient stay in bed. In these days of increasing consumer input into obstetric practice, induction with oxytocin may be resented by many patients. The recently introduced technique of intravaginal, extracervical placement of prostaglandins is much less invasive. Patients can walk around, their labour is more "physiologic", and the method is much more acceptable to those patients who want "natural childbirth".

Prostaglandins have been administered via intravenous, oral, extra-amniotic and intravaginal routes. Intravaginal, extracervical placement of the drug is now standard and in Europe has replaced oxytocin infusion as the commonest method of induction (R.P. Husemeyer: personal communication, 1984). Prostaglandins also stimulate the uterus (which is insensitive to oxytocin), soften the cervix by a direct effect and do not cause water retention.

The following study was performed to assess the feasibility of inducing labour with vaginally administered prostaglandin E$_2$ in a Canadian community-hospital setting.

Methods

The procedure was explained to 50 consecutive, unselected patients who were to have labour induced. The most common indication was prolonged pregnancy (Table I). Before insertion of the prostaglandin in the cervix was assessed and a modified Bishop's score recorded. The cervix was classified as unripe (score 0 to 3) in 16 patients, moderately ripe (score 4 to 7) in 18 patients and ripe (score 7 to 12) in 16 patients. There were 24 primigravidas and 26 multigravidas. One woman had a twin pregnancy.

In 41 of the patients prostaglandin E$_2$ tablets were inserted by hand into the upper vagina around the cervix, with a clear gel used for lubrication. The dose ranged from 3 to 5 mg (6 to 10 tablets), the larger doses being used for primigravidas with a less ripe cervix and the smaller doses for multiparas with a riper cervix. In the other nine patients 2 mg of prostaglandin E$_2$ was suspended in lubricant gel by the pharmacy staff and inserted with a 20-mL syringe. The patients were asked to stay in bed for an hour. The fetal heart rate was monitored during this

<table>
<thead>
<tr>
<th>Reason</th>
<th>No. of patients</th>
</tr>
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<tbody>
<tr>
<td>Pregnancy prolonged</td>
<td>23</td>
</tr>
<tr>
<td>Fetal well-being thought to be impaired</td>
<td>7</td>
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<tr>
<td>Induction at term because of patient's preference or because of poor obstetric history</td>
<td>5</td>
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<tr>
<td>Discomfort (e.g., crippling backache)</td>
<td>4</td>
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<tr>
<td>Hypertension</td>
<td>3</td>
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<tr>
<td>Social factors</td>
<td>2</td>
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<tr>
<td>Diabetes mellitus</td>
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<td>Cholestasis of pregnancy</td>
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<td>Bell's palsy</td>
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<tr>
<td>Hydramnios</td>
<td>1</td>
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<tr>
<td>Recurrent urinary tract infection</td>
<td>1</td>
</tr>
<tr>
<td>Premature rupture of membranes</td>
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time. The patients were then encouraged to be up and about, with intermittent fetal monitoring, unless the fetus was judged to be at increased risk, in which case monitoring was continuous. Amniotomy was carried out 2 to 4 hours after insertion of the prostaglandin unless the membranes had ruptured spontaneously. Amniotomy was performed irrespective of the state of the cervix.

Results

The 50 women were delivered of 51 infants. There were no stillbirths, neonatal deaths or congenital anomalies. At 1 minute the Apgar score of 47 (92%) of the infants was 8 or more. In three infants (6%) it was 7, and in one (2%) it was 6.

The mean interval between the administration of prostaglandin E2 and delivery was 12 (extremes, 3 and 36) hours; for primigravidae with an unripe cervix the mean was 16 hours and for multigravidae with ripe cervixes, 7 hours. The tablets and gel suspensions both induced labour, but the gel was thought to be more easily inserted.

In nine women (18%) oxytocin was required because of a failure of labour to progress but was not given until 8 hours after the prostaglandin to reduce any possible synergism.

Transiently abnormal patterns seen on the fetal monitor in six cases led to intervention in only one case: because of persistent bradycardia in the second stage of labour a forceps delivery was carried out; the infant was in good condition at birth.

With the exception of the second twin (which made a breech presentation) all presentations were cephalic. In 8 (17%) of the 48 vaginal deliveries forceps were used. Two of the three cesarean sections were necessary because of failure of labour to progress despite oxytocin administration (both women had an unripe cervix when labour was induced); the other was necessary because of cephalopelvic disproportion.

One woman had vaginal bleeding during the transition to the second stage of labour, and another had vaginal bleeding post partum; neither required a blood transfusion. Apart from postpartum deep-vein thrombosis in one other patient there were no complications.

Discussion

The induction of labour with intravaginally placed prostaglandin was very well received by the women, including those wanting natural childbirth. The gradual onset of labour achieved was more "natural" than when oxytocin is used. Women who had had labour induced with oxytocin in previous pregnancies commented favourably on the new method.

While there have been scattered reports of untoward side effects with prostaglandins used to induce labour (in two cases the uterus ruptured at the scar of a previous cesarean section [one of the infants died] and in a third the fetus died after premature detachment of the placenta) the overall record is one of safety. In the accumulated experience of 2012 women represented in 10 papers reviewed by Simmons and Savage there were no perinatal deaths. Hypertonus severe enough to warrant the use of a β-sympathomimetic agent to counteract it was seen in only seven (0.4%) of the patients, and the frequency of cesarean section ranged between 0.5% and 3.6%. Our own cesarean section rate was 6%, a figure close to those reported in other series.

The trend to replace oxytocin, administered intravenously, with prostaglandin, administered intravaginally, is far advanced in the United Kingdom but is perhaps only just beginning in Canada. This series shows that induction of labour with prostaglandin E2 tablets or gel placed in the upper vagina appears to be safe and effective in a Canadian community-hospital setting. This will probably become the method of choice in the 1980s.

References

2. Turnbull AC, Anderson ABM: Induction of labour. 3: Results with amniotic


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