Why we should ban oxytocin augmentation of labour

Matilda International Hospital

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5th October 2014
Sir Henry Dale

• Cat model, balloon catheters in bladder, bowel and uterus
• Injected posterior pituitary extract
• Noticed that it made the uterus contract

H. H. Dale.
On some physiological actions of ergot. 
Sir William Blair-Bell

- Used extract of posterior pituitary to control postpartum haemorrhage

W. Blair Bell.
The dosage and action of Pituitary extract and the ergot alkaloids on the uterus in labour, with a note on the action of adrenalin.
It has been recognised for many years that while pituitary extract is of valuable assistance in midwifery, there is a real danger in its indiscriminate use. Reports from time to time of serious accidents such as lacerations of the cervix and perinaeum, and even rupture of the uterus have alarmed teachers of obstetrics, with the result that there is a tendency on their part to regard the use of pituitary extract before the birth of the child (and placenta) as highly dangerous.
Prevention of Prolonged Labour

JOHN T. GALLAGHER,† M.A.O., M.R.C.O.G.

British Medical Journal, 1969, 2, 477-480

Summary: A prospective study of 1,000 consecutive primigravid deliveries has shown that active management in labour can ensure that every woman is delivered within 24 hours. Emphasis is laid on the importance of a correct initial diagnosis of labour based on objective criteria. Amniotomy followed by oxytocin infusion is advocated to simulate the progress of normal labour unless this is evident from an early stage.

Oxytocin, the dose of which is limited only by foetal distress, cannot be used effectively unless three popular fallacies are rejected. Firstly, that prolonged labour is often an expression of cephalo-pelvic disproportion; secondly, that oxytocin may rupture the primigravid uterus; and, thirdly, that there is a valid therapeutic distinction between hypotonic and hypertonic uterine action.

Stimulation, properly supervised, is safe to mother and child, it eliminates the problem of occipitoposterior position, results in a sharp decline in forceps delivery, and obviates the need for massive analgesia.

Introduction

Prolonged labour presents a picture of mental anguish and physical morbidity which often leads to surgical intervention and may produce a permanent revulsion to childbirth, expressed by the mother as voluntary infertility; it constitutes a danger to the survival and subsequent neurological development of the infant (Jeffcoate et al., 1952; Lancet, 1963). The harrowing experience is shared by relatives, and by doctors and nurses to the extent that few complications so tarnish the image of obstetrics.

There have been many publications on the subject which have been concerned mainly with aetiology, complications, and treatment (Hawkins and Nixon, 1957; Garrett, 1960; Barr, 1964). When prevention has been considered the value of stimulation has been presented as controversial or the application has been restricted by excessive caution (Garland, 1961; Schulman, 1966). Because no course of management which is not qualified by serious limitations has been described, it is not surprising that prolonged labour continues to be a problem. The purpose of this paper is to show that prolonged labour can be prevented by effective stimulation. In the process it is emphasized that some of the conventions of delivery ward practice must be abandoned.
Active Management of Labour

KIERAN O’DRISCOLL, JOHN M. STRONGE, MAURICE MINOGUE

Summary

Active management of labour has been developed to the extent that an assurance is given to every woman who attends this hospital that her first baby will be born within 12 hours. This assurance could lead to a welcome change in present attitudes because the mere prospect of prolonged labour is often a cause of serious concern during a first pregnancy. Labour of strictly limited duration makes it possible to provide every woman with a personal nurse, and it places the problem of pain in a new setting.

The results of a prospective study of 1,000 consecutive primigravidae are presented, and the guidelines to a standard policy of management are defined. Difficulty in meeting the commitment to early delivery arose almost exclusively in cases in which the diagnosis of labour was in doubt; only seven women were retained in the delivery unit for 12 hours.

A policy of active management was pursued to ensure that every patient was delivered within 12 hours. Cervical dilatation was plotted on a simple graph (Friedman, 1967). Intervention was mandatory unless cervical dilatation exceeded one centimetre each hour. Stimulation was by artificial rupture of the membranes followed by oxytocin infusion after an interval of one hour. A standard concentration of 10 units of oxytocin per litre was used. The rate of infusion started at 10 drops and increased every 15 minutes to a maximum of 60 drops per minute. The volume was limited to one litre. The drip was operated manually, and every patient in labour had a personal nurse. Oxytocin was given to 550 patients (55%).

Pethidine was the only analgesic drug permitted; a test dose of 50 mg was given and this was repeated after 30 minutes. Epidural anaesthesia was available on a selective basis.

Results

Diagnosis of Labour.—The circumstances in which patients entered the delivery unit were as follows: 903 admitted themselves in labour, 63 were admitted for oxytocin induction, and there were 34 elective caesarean sections. The diagnosis of labour
Active Management of Labor as an Alternative to Cesarean Section for Dystocia

KIERAN O’DRISCOLE, MD, MICHAEL FOLEY, MD, AND DERMOY MACDONALD, MD

There is general agreement that a solution to the problem of dystocia would go a long way toward resolving the contentious issue of high cesarean birth rates that have become such a prominent feature of obstetric practice in recent years. At the National Maternity Hospital in Dublin, one of the largest obstetric units in Western Europe, this situation has been averted through a coordinated policy of early detection and effective treatment of abnormal uterine action over a period of 15 years. During 1980 the number of births was 8742, the incidence of cesarean section was 4.8%, and mothers were assured of delivery within 12 hours after admission to the labor unit. It is proposed that these results could be reproduced elsewhere. (Obstet Gynecol 63:485, 1984).

alternative, medical approach to prevention and treatment of abnormal labor. This method leads to a much lower incidence of cesarean section and comparable perinatal results.

Materials and Methods

A prospective examination of abnormal labor, mainly as an indication for cesarean section, was conducted at the National Maternity Hospital in Dublin for the duration of the calendar year 1980. The number of mothers delivered was 8742. The demographic features are listed in Table 1.

Upon entry to the labor unit, each patient was

NB CS rate in 2012 was 22.7%
CLOSED LOOP FEEDBACK CONTROL OF OXYTOCIN INFUSION

BASELINE UTERINE ACTIVITY MEASURED FOR 30 MIN.

NORMAL or HIGH
No Oxytocin

LOW

Incremental Phase

Activity Plateaus

Activity ↓ below 500 k Pas

Activity Stable

Activity ↑ Above 1500 k Pas

Oxytocin dose-rate ↓
(2mIU increments each 15 min.)

Oxytocin dose-rate ↓ by 50%
(Uterine Activity Optimal)

Oxytocin dose-rate ↑

Oxytocin dose-rate unchanged

Oxytocin dose-rate ↑ by 50%
SONICAIID
AUTOMATIC
INFUSION
SYSTEM

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>AIS</th>
<th>High-dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>20</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>% CS</td>
<td>45</td>
<td>33</td>
<td>26</td>
</tr>
<tr>
<td>Admit-delivery (hrs)</td>
<td>27</td>
<td>25</td>
<td>23</td>
</tr>
<tr>
<td>% hyperstimulation</td>
<td>0</td>
<td>0</td>
<td><strong>37</strong></td>
</tr>
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</table>
with younger children than with older ones.16 So why the delay? Support from the medical community is paramount. It has proved to be effective in several countries, and was an important factor in increasing seat belt usage in the UK. It is essential to raise awareness and bring pressure to bear both locally and nationally. If one or two schools required their pupils to wear helmets when they ride to school it would help considerably. The media campaign often works when — eg, the BBC “That’s Life” programmes on child car seats, horse riding helmets, and kettle flexes. Encouragement by general practitioners, child health doctors, paediatricians, and health visitors will also help, as will greater availability and sound advice from cycle dealers. Cycling organisations should lend their support; organised sport apart, these organisations have been singularly unenthusiastic about helmets, largely on the grounds of discomfort and interference with freedom. The Child Accident Prevention Trust, the Parliamentary Advisory Council on Transport Safety, and the Royal Society for the Prevention of Accidents all support the use of appropriate helmets.

So if you are going to buy a bicycle make sure you buy a cycle helmet — if you can find one that is suitable. And if you plan to accompany a child on the road—as you should do at least until he is 12 or so17—wear a helmet. As Ballantyne says: “It’s inconvenient. So is not being able to think or talk because your head has been pounced into jelly.”

HOW ACTIVELY SHOULD DYSTOCA BE TREATED?

In terms of perinatal mortality there is no evidence of positive benefit from the high and increasing caesarean section rates in western countries.13 Concern has been expressed18 as to whether the rates of operative intervention may safely be stabilised or reduced. In view of high repeated caesarean section rates in some countries, it is of critical importance to re-evaluate the indications for primary section. These indications are not always recorded consistently, but dystocia and cephalopelvic disproportion figure largely in hospitals with high caesarean section rates. Cephalopelvic disproportion is often included with dystocia19 because recent practice has been to diagnose disproportion by analysis of partographs, rather than by pelvimetry. Dystocia was thought to be responsible for 30% of the increase in caesarean section rates in the USA from 1970 to 1978. Since it is not biologically plausible that there could be a genuine change in this magnitude in the capacity of nulliparous to labour, differences must be due to changes in ascertainment or management of the condition. In a hospital in Cleveland, Ohio, where dystocia was diagnosed objectively before the decision was taken to proceed with caesarean section,20 it accounted for a much smaller proportion of sections than in a national survey. Last year we published a comparison21 of practice in two hospitals with comparable populations, one in Ireland and the other in the USA, that revealed an astonishing variation in the proportion of multiparous in whom disproportion was the stated indication for section (17% in the Irish hospital, 11% in the American one). Clearly the apparent discrepancies in ascertainment really reflect differences in management.

As early as 1970, O’Driscoll in Dublin22 advocated active management of labour in primigravidae. It was argued that a diagnosis of disproportion could not be made unless uterine action was adequate. Only if the fetal head had failed to descend while there was dilatation of the cervix could disproportion be confidently diagnosed (in less than 1%). Consistently good results have been reported from this unit for many years,23 with data strongly suggesting that the low section rate for dystocia (4%) is attributable to the administration of high-dose intravenous oxytocin to each nulliparous in established labour but not experiencing cervical dilatation at a rate of at least 1cm per hour. However, there are other unique features at the National Maternity Hospital, Dublin, such as the very low epidural rate and the respect accorded to midwives, so prospective studies are necessary to assess the true value of oxytocin augmentation.

An important contribution has now been made by a randomised control study in London.24 Nulliparous in spontaneous labour at term were recruited to the study if the cervix was dilating at less than 0·5 cm per hour. They were randomised to one of three groups: (a) no treatment for 8 hours; (b) low-dose oxytocin given by means of an automatic infusion system; (c) high-dose oxytocin. The high-dose group had shorter labours, and both treated groups had more rapid cervical dilatation than the control group, but there was no significant reduction in the caesarean section rate nor improvement in the condition of the baby. However, numbers were small. A detailed evaluation of uterine activity25 was carried out by using the uterine activity integral (UAI), which measures active contraction area per 15 min. Any increase in UAI over 1200 Kpa/min doubles the frequency of contractions without increasing active pressure, and may therefore cause fetal anaemia without much improvement in cervical dilatation.

These studies cast doubt upon the necessity for high-dose (as opposed to low-dose) oxytocin infusion, and since 50% of the untreated control group achieved vaginal delivery, the conservative approach remains a valid clinical option. There is also a need for scientific evaluation of alternative strategies (such as amniotomy or baths) in the management of slowly progressing labour. At present, low-dose oxytocin infusion with careful assessment of uterine activity is the best policy in most cases.
Lancet editorial January 23rd 1988

• These studies cast doubt upon the necessity for high-dose oxytocin infusion and since 50% of the untreated control group achieved vaginal delivery, the conservative approach remains a valid option.
Rates of oxytocin augmentation in first labours and incidence of CS

ACTIVE MANAGEMENT OF LABOUR

• Early amniotomy and early oxytocin do not reduce rates of caesarean sections and operative vaginal deliveries

• Units should not introduce active management but should provide continuous support in labour. Units should perform amniotomy and oxytocin acceleration selectively, if at all
The active mismanagement of labour

We are all working together to one end, some with knowledge and design, and others without knowing what they do

Marcus Aurelius

but does not affect perinatal outcome or operative delivery rates. Paradoxically, we have invested heavily in the development of that part of active management which has no useful effect, yet with

"shortening labour by force does not improve clinical outcome"
Early amniotomy and early oxytocin for prevention of, or therapy for, delay in first stage spontaneous labour compared with routine care

Shuqin Wei1, Bi Lan Wo1, Hui-Ping Qi2, Hairong Xu1, Zhong-Cheng Luo1, Chantal Roy3, William D Fraser1,*

Editorial Group: Cochrane Pregnancy and Childbirth Group
Published Online: 7 AUG 2013
Assessed as up-to-date: 8 JUL 2013
DOI: 10.1002/14651858.CD006794.pub4
Cochrane 2013

• ‘Prevention’
  – unselected women in early spontaneous labour, if delay in labour, allocated to either early amniotomy and oxytocin or to usual care

• ‘Therapy’
  – Only included women with an established delay in labour progress.
### CS rate (prevention)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Early amnionitis/oxytocin</th>
<th>Conservative management</th>
<th>Risk Ratio M-H,Random,95% CI</th>
<th>Weight</th>
<th>Risk Ratio M-H,Random,95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Br\textsuperscript{e}x00e9 art 1992</td>
<td>45/989</td>
<td>47/979</td>
<td>9.2 %</td>
<td>0.95 [ 0.64, 1.41 ]</td>
<td></td>
</tr>
<tr>
<td>Cammu 1996</td>
<td>6/152</td>
<td>154</td>
<td>0.9 %</td>
<td>1.52 [ 0.44, 5.28 ]</td>
<td></td>
</tr>
<tr>
<td>Cohen 1987</td>
<td>10/75</td>
<td>176/906</td>
<td>2.3 %</td>
<td>0.91 [ 0.41, 2.01 ]</td>
<td></td>
</tr>
<tr>
<td>Frigoletto 1995</td>
<td>197/1009</td>
<td>176/906</td>
<td>44.0 %</td>
<td>1.01 [ 0.84, 1.21 ]</td>
<td></td>
</tr>
<tr>
<td>Lopez-Zeno 1992</td>
<td>37/351</td>
<td>50/354</td>
<td>9.2 %</td>
<td>0.75 [ 0.50, 1.11 ]</td>
<td></td>
</tr>
<tr>
<td>Rogers 2000</td>
<td>15/200</td>
<td>24/205</td>
<td>3.9 %</td>
<td>0.64 [ 0.35, 1.18 ]</td>
<td></td>
</tr>
<tr>
<td>Sandler 2000</td>
<td>30/320</td>
<td>32/331</td>
<td>6.5 %</td>
<td>0.97 [ 0.60, 1.56 ]</td>
<td></td>
</tr>
<tr>
<td>Serman 1995</td>
<td>7/75</td>
<td>14/70</td>
<td>2.0 %</td>
<td>0.47 [ 0.20, 1.09 ]</td>
<td></td>
</tr>
<tr>
<td>Snehala 2011</td>
<td>6/50</td>
<td>9/50</td>
<td>1.6 %</td>
<td>0.67 [ 0.26, 1.73 ]</td>
<td></td>
</tr>
<tr>
<td>Somprasit 2005</td>
<td>38/320</td>
<td>94/640</td>
<td>11.8 %</td>
<td>0.81 [ 0.57, 1.15 ]</td>
<td></td>
</tr>
<tr>
<td>Taboei 2003</td>
<td>20/221</td>
<td>36/227</td>
<td>5.5 %</td>
<td>0.57 [ 0.34, 0.95 ]</td>
<td></td>
</tr>
</tbody>
</table>

**Subtotal (95% CI)**

<table>
<thead>
<tr>
<th>Early amnionitis/oxytocin</th>
<th>Conservative management</th>
<th>Risk Ratio M-H,Random,95% CI</th>
<th>Weight</th>
<th>Risk Ratio M-H,Random,95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>3762</td>
<td>3991</td>
<td>97.0 %</td>
<td>0.87 [ 0.77, 0.99 ]</td>
<td></td>
</tr>
</tbody>
</table>

Total events: 411 (Early amnionitis/oxytocin), 497 (Conservative management)

Heterogeneity: Tau\textsuperscript{2} = 0.00; Chi\textsuperscript{2} = 10.20, df = 10 (P = 0.42); I\textsuperscript{2} =2%

Test for overall effect: Z = 2.09 (P = 0.037)
CS rate (therapy)

Total events: 411 (Early amniotomy/oxytocin), 497 (Conservative management)

Heterogeneity: Tau^2 = 0.00; Chi^2 = 10.20, df = 10 (P = 0.42); I^2 = 2%

Test for overall effect: Z = 2.09 (P = 0.037)

2 Therapy

Blanch 1998
5/21 2/19

Cluett 2004
11/50 8/49

Nachum 2010
1/71 1/70

Subtotal (95% CI)
142 138

Total events: 17 (Early amniotomy/oxytocin), 11 (Conservative management)

Heterogeneity: Tau^2 = 0.0; Chi^2 = 0.43, df = 2 (P = 0.80); I^2 = 0.0%

Test for overall effect: Z = 1.09 (P = 0.28)

Total (95% CI)
3904 4129

Total events: 428 (Early amniotomy/oxytocin), 508 (Conservative management)

Heterogeneity: Tau^2 = 0.0; Chi^2 = 12.67, df = 13 (P = 0.47); I^2 = 0.0%

Test for overall effect: Z = 1.84 (P = 0.065)

Test for subgroup differences: Chi^2 = 2.08, df = 1 (P = 0.15), I^2 = 52%

12% vs 10% 11% vs 12.3%
Cochrane Summary

• 14 trials including 8033 women
• CS rate early oxytocin/ARM - 11%
• CS rate controls - 12.3%
• CS OR 0.89 (95% CI 0.79 to 1.01)
• P = 0.061 (chi squared)
• Shorter labour by 1.3 hours
Each clinical specialty is allocated into one of five categories:

low risk, medium risk, high risk, very high risk and obstetrics
Catherine Dixon appointed
New Chief executive April 2012

We changed the way we price our indemnity cover so that organisations with fewer and less costly claims pay less. This creates an incentive for members to improve patient safety and reduce claims.

Catherine Dixon
Chief Executive Officer

resigned August 2014
Total Expenditure of the NHS Litigation Authority

http://www.nhsla.com/home.htm

£1.085B
Annual value of CNST obstetrics payouts per year

£1.4M per day
NHS spends £700 on negligence cover for every birth

By Adam Brimelow
Health Correspondent, BBC News

The NHS spends nearly £700 on clinical negligence cover for every live birth in England, a report says.

The review by the National Audit Office said last year this cost nearly £500m - almost a fifth of all spending on maternity.

Public Accounts Committee chairwoman Margaret Hodge said the figure was "absolutely scandalous".
• 472 cases of suspected medical malpractice
• 177 (38%) babies had severe asphyxia due to malpractice / poor supervision
• Signs of asphyxia overlooked – 71%
• Incautious use of oxytocin – 71%
• Non-optimal mode of delivery – 52%
A damning report by the Health Service Ombudsman for England condemns as "indefensible" the way Mrs Callaway's labour was managed.

The report states that a drug used to speed the labour should have been stopped when the CTG showed signs that the baby was being deprived of oxygen.

Instead, staff doubled the dose of Syntocinon, a synthetic version of the hormone which controls contractions.
Case Study 2

A 31 year old woman with a pregnancy at term plus 10 days.
The CTG showed a significant bradycardia down to 40 bpm and 3 late decelerations with slow recovery and reduced variability.
The midwife incorrectly identified the bradycardia as ‘reactive’.
The registrar prescribed syntocinon despite the CTG trace showing no accelerations, reduced variability, significant bradycardia and unprovoked decelerations.
The midwife then increased the dosage of syntocinon several times despite the abnormal CTG trace.

Whilst the claimant has normal tone with no spasticity, ataxia or dystonic posturing, they will have significant cognitive impairment and be incapable of independent living. The claimant shows speech delay, is microcephalic and suffered from complex febrile seizures.
Kate, 38, a human resources administrator, was nine days overdue when she was admitted to Yeovil District Hospital. Her waters were broken, and over the following 48 hours she recalls a succession of examinations and epidurals, fetal heart monitors and drugs. But there was one thing Kate barely noticed. The doctor who instructed that a drip be turned up again and again. Kate now knows the drip contained a drug called oxytocin.
Syntocinon

• Cheap to buy but expensive to defend
• Makes a marginal contribution to improving the outcome of spontaneous labour
• It seems impossible to teach people to use it safely
• Its use for augmentation of labour should be discontinued