observation of all those aspects about which there is current
disagreement, will some light be thrown on the rather heated
public and professional debate on modern obstetric practice.

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Requests for reprints should be addressed to Dr I Chalmers.

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Obstetric practice in the Oxford Record Linkage Study
Area 1965-72

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Summary

The secular trends in induction in 111,818 births over
eight years in the largely rural areas of Oxfordshire and
west Berkshire were analysed. Although the induction
rate started to rise only in 1968, the forceps and epis-
iotomy rates had been increasing throughout, but both
procedures were always twice as prevalent in induced
as in non-induced cases. The proportion of women given
an anaesthetic was also consistently higher in induced
cases, but that of women with long labours fell consider-
ably over the period. The reduction in stillbirth rate was
more apparent in induced than in non-induced births.

Introduction

The management of labour and delivery has become a subject
of heated debate recently. The pointed questions about the
value of induction, the dangers to the fetus, the possible harm
to the mother, and the alleged increased need for anaesthesia,
have come largely from the articulate lay public rather than
the medical profession. It became apparent that there were
little or no data on the prevalence and outcome of various
obstetric procedures with which to answer the questions and
possibly refute the allegations.

In an attempt to provide some basic data for discussion we
have analysed two aspects of this subject. In this first paper we
consider the epidemiology of induction in one area over eight
years to show the trends. In a further study,¹ the results of
induction in a hospital group covering some 5000 births a

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BRITISH MEDICAL JOURNAL 27 MARCH 1976

year will be discussed in more depth for one particular year.
We do not aim to provide definitive answers but rather to
attempt to put the whole topic in perspective and provide data
to focus attention on those areas in further study seems
to be advisable.

Methods

The Oxford Record Linkage Study¹ ² collects information on every
delivery in Oxfordshire and west Berkshire. The area is largely
rural with several market towns and the two small cities of Reading
and Oxford and has a total population of about 800 000. Details of
each pregnancy, labour, and delivery and the subsequent morbidity
of mother and child are abstracted from hospital case records and, in
the case of domiciliary deliveries, midwives' notes. The degree of case
ascertainment is checked by matching the cases with birth and still-
birth certificates, photocopies of which are forwarded to us by the
Office of Population Censuses and Surveys.

In the present analysis we included all those deliveries to women
resident and delivered in the area in 1965-72. Social class was coded
using the definitions of the Registrar General (1961, 1966, and 1971)
from information on paternal occupation recorded on the birth and
stillbirth certificates. Parity is the number of previous pregnancies
resulting in either a livebirth or a fetal death of gestation 28 weeks or
more.

Induction was defined as a procedure, such as artificial rupture of the
membranes or administration of oxytocin, designed to start
contractions. Such procedures were not coded as inductions if they
were intended merely to accelerate a labour that had already begun.
The length of labour is the length of time from the onset of regular
contractions to the delivery of the infant, and must, by definition, be
less than the induction to delivery interval (IDI). Anaesthesia includes
all general and local anaesthetics but excludes simple analgesic
procedures such as "gas and air."

Results

The annual number of births fell gradually over the eight years,
and the proportion of these delivered at home fell from 25% in 1965
to only 3% in 1972 (table 1). The proportion of infants delivered to
primiparous increased slightly throughout, whereas the proportion
delivered to grand multiparous declined considerably. There was little
variation in the illegitimacy rate, but, in accord with data for the
country as a whole, the proportion of deliveries to women in the
social classes IV and V fell (Registrar General, 1975). There was little change in the proportion of teenage mothers but a gradual decrease in the proportion of women aged 35 or over, from 1969. The prevalence of induction appears to have begun to increase in this area (table II). In contrast the forceps rate rose steadily from 1965. The caesarean section rate showed a slight but irregular rise over the whole period, as did the proportion of women receiving anæsthesia. In contrast, there was an overall fall in the proportion of women whose labour lasted over 12 hours, but only from 1968. As in the Cardiff study, the most dramatic increase was in the proportion of women who had episiotomies.

Although a fairly constant 12% of inductions have been purely medical over the years, after 1969 there was a large increase in the proportion of women who had their membranes ruptured and also received oxytocin and a corresponding fall in the proportion induced by surgical means alone (table III).

Unfortunately data on the time intervals from induction to delivery were only recorded from 1968, but they showed a strong trend: in 1968 26% of inductions had an IDI of over 24 hours and 6% an IDI of over 48 hours, whereas by 1972 only 5% had an IDI over 24 hours and only 0.5% had one of over 48 hours. The fall in the proportion of very long intervals presumably resulted from the increased use of oxytocin after rupture of the membranes.

Further analysis showed that for every year the forceps rate when labour had been induced was about twice that occurring after spontaneous onset. The caesarean section data were less easy to interpret. There was a slight decrease in the number of induced pregnancies resulting in a caesarean section and an increase in the remainder, but without a detailed analysis of the reasons for the sections it would be naive to suggest any meaningful interpretation of this.

A change in length of labour began in 1968 (table IV). Until then the proportion of long labours seemed to have been fairly static. From 1968 the proportion of long labours fell quite dramatically among women whose labours were induced but in a far more leisurely fashion among the group with spontaneous onset. Unfortunately we have no details on whether labour had been accelerated with oxytocin in any of this group.

Variation in characteristics of women being induced—The tendency throughout has been for induction to be prescribed more for older women and either primiparae or grand multiparae (table V). There was little variation with social class: if anything, the women of social classes IV and V were slightly less likely to be induced in spite of their higher risk of perinatal death.

Effect on mortality—Throughout the area the perinatal death rate fell from 20 per 1000 in 1965 to 16 per 1000 in 1972 (table II). This decrease in the proportion of induced labours not only lead to a lower proportion of women with ruptured membranes but also a lower rate of induction to delivery interval, and a lower rate of forceps delivery. Although these changes could not be shown to be causally related, they are at least consistent with the hypothesis of a decrease in the severity and frequency of the complications which sometimes necessitate forceps delivery. A significant decrease in the caesarean section rate was also noted in this area.

Unfortunately the decline in the proportion of forceps deliveries has not been matched by a similar decrease in the proportion of caesarean sections. In 1972 the caesarean section rate was 3.5% as against 3% in 1968. The reasons for these increases are not clear, but they may be related to the rise in the proportion of long labours induced. The increased use of forceps delivery has also been noted in other areas, particularly in the United States, and may be due to increased use of oxytocin in the delivery room.

Although there has been a decrease in the proportion of induced labours, the proportion of induced labours with a forceps delivery has remained fairly constant at around 10%. This is in marked contrast to the increase in forceps deliveries in the whole population, where the proportion of forceps deliveries has more than doubled from 1968 to 1972. The reasons for this are not clear, but they may be related to the increased use of oxytocin in the delivery room.
Expect the perinatal mortality rate to fall in both non-induced and induced groups, though not overall.

That there has been an overall fall in perinatal mortality can be explained partly by a reduction in the proportion of high-risk elderly women and those of high parity and low social class, but changes in obstetric practice may also have caused an overall reduction, especially in stillbirths.

We are extremely grateful to Professors A C Turnbull and J Bonnar for encouraging our interest in this topic and to Dr J A Baldwin, director of the unit of clinical epidemiology, for helpful criticism. This study could not have been completed without the help of the machine room of the Oxford Regional Health Authority or the secretarial help of Mrs Jean Lawrie.

Reports requests should be addressed to Jean Fedrick, Unit of Clinical Epidemiology, c/o Oxford Regional Health Authority, Old Road, Headington, Oxford.

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e Antigen in acute hepatitis B

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Summary
To examine the association between e antigen and hepatitis-B surface antigen (HBs Ag) we studied 90 inpatients with acute viral hepatitis type B. e Antigen was present in 24 of the patients; these patients had detectable levels of HBs Ag for significantly longer than the 66 with no e antigen in their serum. The HBs Ag subtypes D (adw) and Y (ayw) were similarly distributed among patients with e antigen and among those without, and no differences in the results of biochemical liver function tests were observed between the two groups during the acute phase of illness. Three of the five patients who developed clinical and histological signs of chronic liver disease were positive for e antigen, a finding which supports the hypothesis that e antigen has a prognostic value in hepatitis B.

Introduction
In 1972 new immunological specificities closely related to the synthesis of hepatitis B surface antigen (HBs Ag) were identified.1 One of the specificities in this new antigen-antibody system was designated e. Unlike the determinants of HBs Ag described by Le Bouvier,2 e was not a surface component of HBs Ag but represented another distinct antigen carried on free particles physicochemically different from HBs Ag. Further characterisation of e antigen indicated that it had a considerably lower molecular weight than HBs Ag, and, in contrast to HBs Ag, the e antigen was not a lipoprotein, as judged from its buoyant density and non-staining with lipid stains.3 Clinical studies showed that the e antigen was commonly associated with HBs Ag-positive chronic liver disease after hepatitis B.4-6

We report here the results of studies designed to assess the significance of the e antigen in inpatients with acute hepatitis-B infection.

Patients and methods
We studied 90 patients with HBs Ag-positive acute hepatitis who were admitted to the clinic for infectious diseases, East Hospital, Göteborg, from July 1972 to July 1973. Viral hepatitis was diagnosed on the basis of raised aminotransferase levels (at least 10 times the upper limit of normal). Only patients admitted within 10 days after the onset of illness (first appearance of dark urine) were included.

In most cases liver biopsy was not performed, but the diagnosis was histologically confirmed in 30 patients.

All patients received the same treatment, which included a stay in hospital during the period of overt jaundice. Follow-up with repeated biochemical tests of liver function about every two weeks was continued until the values became normal. Corticosteroids were given to 14 patients because of prolonged nausea and vomiting. They initially received 30 mg of prednisolone daily, but this was gradually reduced by about 5 mg a week.

HBs Ag was determined by immunodiffusion and immunoelectrophoresis (IEOP) in parallel, as described.3 HBs Ag was subtyped as described elsewhere.3 e Antigen and e antibodies were determined by immunodiffusion as described by Magnius and Espmark.7 The e reagents used have been described in another report.8

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