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Vertically transmitted HIV infection in the British Isles

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Abstract

***Objective*—To describe the epidemiology of vertically acquired HIV infection in the British Isles, the level of underreporting, the vertical transmission rate, and clinical spectrum of paediatric AIDS.**

***Design*—Confidential, linked registers based on reporting from obstetricians and paediatricians; anonymous unlinked neonatal HIV serosurveys.**

***Setting*—British Isles.**

***Subjects*—Children born to mothers with HIV infection.**

***Main outcome measures*—Trends in HIV infection and vertical transmission rate.**

***Results*—In Scotland and the Irish Republic, where most maternal HIV infection is related to drug misuse, the annual number of reports of children born to infected mothers has fallen since 1989. In England and Wales nearly half of maternal infections have been acquired overseas, and the number of children born to these women, and to women who became infected in Britain, is increasing. In south east England the proportion of live births to women whose infection was identified before delivery was only 17% (50/287), compared with 68% (26/38) in Scotland. The vertical transmission rate was 13·7% (23/168), and 23% of infected children developed AIDS in the first year of life. 41% (38/92) of children born to infected mothers who were ascertained after delivery were breast fed, compared with 5% (12/236) of those ascertained before delivery.**

***Conclusions*—The incidence of vertically transmitted HIV infection is increasing in England and Wales. More extensive antenatal testing would enable infected women to be counselled against breast feeding, which could prevent a substantial proportion of vertical transmission in some areas, and would increase opportunities for early diagnosis and treatment of infected children.**

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Introduction

Active surveillance of AIDS in children in the British Isles began in 1986 through the British Paediatric Surveillance Unit.[1] In 1989 reporting of pregnant seropositive women was initiated in collaboration with the Royal College of Obstetricians and Gynaecologists,[2,3] and paediatric surveillance was extended to include all HIV positive children, whether infected or not. The paediatric and obstetric schemes are linked making prospective data analyses possible

Routine paediatric HIV surveillance tables are published quarterly in the *Communicable Disease Report*[4]; *AIDS Scotland*[5]; *(ANSWER) Communicable Diseases Scotland Weekly Reports*[6]; and the National Study of HIV in Pregnancy quarterly newsletters.[7] We report here on the descriptive epidemiology and ascertainment of vertically acquired paediatric HIV infection in the British Isles, the vertical transmission rate, and the clinical spectrum of reported AIDS.

Methods

Obstetricians report pregnancies in HIV positive women through a scheme run in collaboration with the Royal College of Obstetricians and Gynaecologists.[3] A designated person from each obstetric unit in the British Isles is asked to return a quarterly report card on behalf of the unit, including nil returns if there are no cases to notify. Reports are followed up with a standard questionnaire to obtain information on outcome of pregnancy.

Paediatricians are asked to notify The British Paediatric Surveillance Unit of children who are infected and those of indeterminate infection status each month.[8] The reporting identifies children with AIDS; those with HIV infection as indicated by virus culture, polymerase chain reaction, antigen, or persistence of antibody beyond 18 months; and children of indeterminate status, defined as antibody positive but under 18 months. Cases are also reported directly to the coordinating centre. Reports are followed up annually with a standard questionnaire to determine infection status and clinical progress. Paediatricians are requested to report development of AIDS and death in the interim. We used the Centre for Disease Control definition of AIDS with minor modifications (see footnote of table III).[9]

The obstetric and paediatric schemes have over 90% compliance.[3,8] Cases first identified before 1989 were reported retrospectively. Laboratory reports of HIV antibody positive children forwarded to the Communicable Disease Surveillance Centre and the Communicable Diseases (Scotland) Unit constitute a third scource of data. Data from all sources are combined into a single dataset. All clinical reports are

made in confidence without the use of names, and any reported names are removed from laboratory reports of HIV in children.

STATISTICAL METHODS

We estimated time trends for proportions of children infected by logarithmic binomial regression.[10] Efficiency of reporting systems was assessed by capture-recapture methods,[11] assuming that laboratory reporting by microbiologists is independent of clinical reporting by obstetricians and paediatricians.

Results

CHILDREN BORN TO INFECTED WOMEN

By 31 October 1992, 527 children born to HIV infected women had been reported. One woman had HIV-2 infection and one had both HIV-1 and HIV-2 infection. Of the children 160 were infected, 175 were uninfected, and 192 were of indeterminate infection status. In all, 314 (60%) children were first ascertained by obstetricians reporting live births to infected women; 213 (40%), 62 of whom were born abroad, were first ascertained by paediatricians, generally after the child, a sibling, or parent developed symptoms.

Figures 1 and 2 show the number of reports of children born to infected mothers plotted against year when the child's infection, or risk of infection, was first ascertained (1992 figures are projected on the basis of reports received in the first nine months and reporting delays observed for cases ascertained in 1990 and 1991). The number of children ascertained before delivery rose rapidly until 1986 and has remained at 40 to 50 a year since then. The number of children born in the British Isles first ascertained after delivery has risen since 1989.

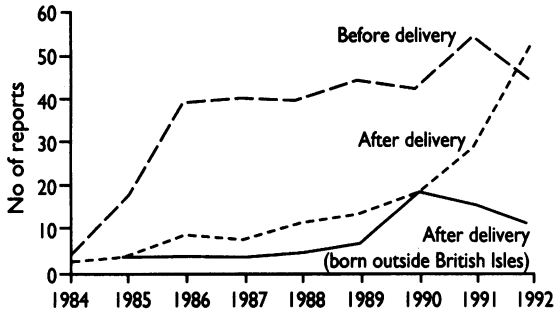

FIG 1—*Reported numbers of children born to mothers with HIV infection ascertained before and after delivery in British Isles and children born outside British Isles, 1984-92*

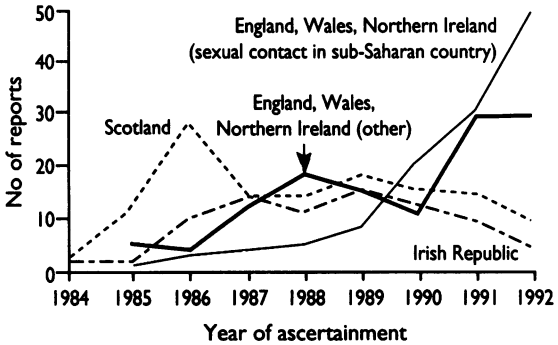

FIG 2—*Number of reports of children born to infected mothers in Scotland, Irish Republic, or England, Wales, and Northern Ireland, 1984-92*

TABLE I—*Children born to infected women: route of maternal infection*

	Born in British Isles				
	England, Wales, Northern Ireland	Scotland	Irish Republic	Born abroad	Total
Injecting drug use	53	104	64	3	224
Blood products	3	0	0	5	8
Sexual transmission:					
Partner of injecting drug user	16	21	10	1	48
Exposure in sub-Saharan country	108	0	0	47	155
Other	37	1	1	3	42
Not known	8	0	3	3	14
Total	225	126	78	62	491*

*For a further 22 children reported only through laboratories the country of birth was not known, and an additional 14 were born in the British Isles but the place of birth was not known.

Examination of maternal source of infection shows two patterns (table I). In Scotland and the Irish Republic most mothers have acquired HIV through injecting drugs (82%) or sexual contact with drug users (15%), and the reported number of deliveries to such women has been decreasing (fig 2). In the rest of the British Isles 48% of women were infected by sexual contact in a country with a high prevalence of heterosexual infection (effectively sub-Saharan Africa),[12] 24% were injecting drug users, 7% were partners of drug users, and 16% were infected through other sexual partners (table I). Although children of infected women from sub-Saharan countries now form the largest, and most rapidly increasing category, reports of births to women who acquired HIV in Britain are also increasing (fig 2).

UNDERASCERTAINMENT

Underascertainment of children born to infected women can be assessed by comparing the number of live births to infected women reported by obstetricians with the number of neonatal seropositive samples found by unlinked anonymous HIV testing.[10,13] Anonymous testing has been carried out since 1988 in North East, North West, and South West Thames regions. Up to July 1992, 287 seropositive dried blood spot samples were found out of 509 185 tested. However, over the same period, only 50 births to infected women had been ascertained before delivery. While the neonatal seroprevalence has risen by a factor of 1·53 each year (χ^2 trend = 59·7; $p < 0·0001$; 95% confidence interval 1·36 to 1·71), the rate of ascertainment before delivery has remained effectively constant (χ^2 trend = 0·01, $p > 0·9$; 0·8 to 1·3).

In Scotland the rate of seropositive neonatal samples remained constant during 1990 and 1991, at 0·3 per 1000.[5,14] In 1990, 14 deliveries to infected women were identified by obstetricians and there were 19 seropositive neonatal samples. In 1991 there were 12 obstetric reports and 19 seropositive neonatal samples. Overall ascertainment before delivery (68%) was substantially higher than in England (17·4%).

After excluding cases from the Irish Republic, which does not contribute laboratory reports, 360 children born to infected mothers were reported up to the end of 1991; 350 were reported by clinicians, 243 through laboratories, and 230 through both clinical and laboratory systems. Capture-recapture methods[11] estimated the number of children known to be born to seropositive mothers (reported and unreported) at 366·6. The reporting efficiencies of the clinical, laboratory, and combined systems were 94·7%, 66·3%, and 98·2% respectively. There was no evidence that the efficiency of reporting had changed since 1984, and the upward trends evident in figures 1 and 2 are therefore unlikely to be due to increased reporting of known cases.

VERTICAL TRANSMISSION RATE

Of the 314 children born in the British Isles in whom HIV infection was recognised in the mother before delivery, 218 were born at least two years before 31 October 1992 (table II). If the 50 children of indeterminate status are assumed to be representative of children born to infected women, the vertical transmission rate can be estimated at 23/168 or 13·7% (95%

confidence interval 8·5% to 18·9%). Seven of the 218 children developed AIDS in the first 12 months of life. If a similar proportion of children with indeterminate status are assumed to develop infection the overall rate of development of AIDS in the first year is $7/(23 + (0{\cdot}137 \times 50))$ or 23·4%.

CLINICAL SPECTRUM OF AIDS

In all, 83 children have developed AIDS, of whom 40 have died. The commonest indicator disease at presentation was *Pneumocystis carinii* pneumonia (25 children; table III) and this, together with disseminated cytomegalovirus infection (CMV), was the earliest presenting AIDS indicator disease (median 4·1 months). Twenty (80%) of the children first presenting with *P carinii* pneumonia have died, 15 within three months of diagnosis. Half of all deaths and 14 (82%) of the deaths in the first year of life were in children who had presented with *P carinii* pneumonia.

Lymphoid interstitial pneumonitis was also common at presentation. Mild or asymptomatic lymphoid interstitial pneumonitis diagnosed on the basis of abnormal chest radiography findings should be distinguished from the severe form of the disease, which results in exercise intolerance or oxygen desaturation. Severe lymphoid interstitial pneumonitis was uncommon and never presented alone at onset of AIDS. None of the 16 children presenting with mild or asymptomatic lymphoid interstitial pneumonitis died until other AIDS indicator diseases had developed.

For the 46 children presenting with AIDS indicator diseases other than *P carinii* pneumonia or mild or asymptomatic lymphoid interstitial pneumonitis who had not progressed to other AIDS indicator diseases, the one year survival was 83%.

BREAST FEEDING

Only 5·1% of women whose infection status was known before delivery had breast fed their infants, compared with 41·3% of those not ascertained until later (table IV). The same pattern was evident irrespective of the mother's exposure category, except in injecting drug users, among whom only 3% had breast fed. After excluding this group women whose infection status was not recognised during pregnancy were about six times more likely to have breast fed their infants.

TABLE II—*State of infection of 218 prospectively ascertained children born at least two years before 31 October 1992*

	No of children
Infected	23
AIDS < 12 months	7
AIDS ⩾ 12 months	4
Other infected	12
Uninfected	145
Indeterminate	50

Discussion

The number of children born each year to HIV positive women in the British Isles has increased steadily since 1984. This is unlikely to be due to changes in either ascertainment or reporting.

In Scotland and the Irish Republic, most maternal infections were related to injecting drug use, and the number of children born to infected mothers has fallen since 1989, mirroring the trends seen in laboratory reports of HIV infection in Scotland.[5] However, laboratory reports of heterosexually acquired infection are beginning to increase,[6] and may be reflected soon in the paediatric data. By contrast, in England, Wales, and Northern Ireland nearly half the maternal infections were acquired in countries with a high prevalence of heterosexual infection. These trends are similar to those shown by laboratory reports for women (Public Health Laboratory AIDS Centre quarterly surveillance tables, No 15, March 1992, table 17), with a steep increase in infection acquired in sub-Saharan countries and a slower increase in other categories.

These geographical trends were parallelled by results from the anonymous neonatal testing programmes. There has been a rise in neonatal seroprevalence in south east England, with a consistently low level of ascertainment before delivery. However, in Scotland seroprevalence remained constant during 1990 and 1991,[14] and ascertainment before delivery was 68%.

The linkage between the obstetric and paediatric reports in the British Isles creates the possibility of prospective study from birth. We calculated a vertical transmission rate of 13·7% from these data, similar to rates reported in other cohort studies in Europe (France 19%,[15] European Collaborative Study 14%,[16] Switzerland 20%[17]). The estimated progression rate to AIDS in the first year of life was 23·4%, similar to results from the European Collaborative Study,[16] and North America.[18,19] The spectrum of AIDS indicator diseases and their associated mortality was also similar to that reported elsewhere.[22-23] We believe that mild or asymptomatic lymphoid interstitial pneumonitis in children should no longer be considered as an AIDS indicator disease as it is associated with a relatively good prognosis.[21]

The frequency and early onset of *P carinii* pneumonia and its high mortality among infected children have been cited as a reason for antenatal testing.[24] Highly effective prophylaxis against *P carinii* pneumonia is available, although it is unlikely that this would influence progression to other AIDS indicator diseases.[25] Prompt treatment and antiretroviral therapy may also have advantages in this group of children.

BREAST FEEDING

Another possible advantage of antenatal HIV testing is that it provides an opportunity to counsel infected women against breast feeding, which is believed to add a 14% risk of vertical infection over and above the risk of transmission at delivery or in utero.[26] Our findings show that, except in women infected through intravenous drug use, in whom breast feeding rates are very low, women whose infection status is known to the obstetrician before delivery are about six times less likely to breast feed than women whose HIV infections ascertained after delivery. This difference is greater than can be explained by the increased risk of infection and subsequent ascertainment in breast fed children

TABLE III—*Pattern of AIDS indicator diseases in children with HIV infection. Some children have multiple diagnoses*

	Present at diagnosis of AIDS		Onset after diagnosis	Median (range) age (months)
	Alone	With others		
Opportunistic infections				
Pneumocystic carinii pneumonia	14	11	2	4·1 (1·4-78·0)
Disseminated cytomegalovirus infection	0	6	1	4·1 (2·2-9·9)
Other opportunistic infections	5	0	6	36·7 (9·9-77·6)
Failure to thrive*	8	15	5	10·9 (3·4-110·5)
Recurrent bacterial infection	8	9	13	28·3 (5·6-102·5)
Encephalopathy†	7	4	8	18·5 (0·3-82·7)
Neoplasms	1	1	1	33·8 (26·0-61·2)
Lymphoid interstitial pneumonitis‡:				
Mild or asymptomatic	16	4	3	28·3 (2·8-82·4)
Severe	0	4	2	45·0 (9·0-117·2)

*Crossing two weight for age centiles (97, 90, 75, 50, 25, 10, 3).
†Two or more of acquired microcephaly, loss of milestones, progressive motor deficits over at least three months.
‡Severe respiratory failure, oxygen dependence, exercise intolerance with oxygen desaturation. Mild or asymptomatic = chest radiography findings with or without mild respiratory signs or symptoms.

TABLE IV—*Breast feeding of HIV seropositive children born in the British Isles*

Mother's exposure category	First ascertained: Before delivery: Total	Before delivery: No (%) breast fed	After delivery: Total	After delivery: No (%) breast fed
Intravenous drug user	154	4 (3)	28	1 (4)
Exposure in sub-Saharan country	42	5 (12)	41	30 (73)
Blood products or other sexual partner	40	3 (8)	23	7 (30)
Total	236	12 (5)	92	38 (41)

and suggests that antenatal testing could prevent a significant proportion of vertical infection.

In a recent survey of all obstetric units in the British Isles, 51% were offering HIV tests only to women perceived as being at risk, 3% to all women, and the remainder had no formal policy.[3] Our results show that in south east England, only 17% of live births to infected women are recognised before delivery. There is therefore considerable scope for improvement in antenatal HIV testing programmes.

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Assessing long term backache after childbirth

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Abstract

***Objectives*—To investigate the factors associated with long term backache after childbirth, to assess all women reporting new onset long term backache, and to investigate any relation with pain relief in labour.**

***Design*—Data collected from obstetric records and postal questionnaires or telephone interviews on morbidity after childbirth from all women delivering their first baby between March 1990 and February 1991, followed by analysis of data collected from outpatient consultations.**

***Setting*—St Thomas's Hospital, London.**

***Subjects*—Questionnaires were sent to 1615 women who had delivered their first baby in the defined period; 1015 either replied by post or were contacted by telephone.**

***Results*—299 women (29·5% of responders) reported backache lasting more than six months and of these 156 (15·4%) said they had had no back problems previously. Those women who had received epidural analgesia in labour were significantly more likely to report new onset backache (17·8%; 95% confidence interval 14·8% to 20·8%) than those who did not (11·7%; 8·6% to 14·8%). Younger women, unmarried women, and those reporting other antenatal symptoms were significantly more likely to report new long term backache. The 156 women reporting new backache were asked to attend an outpatient clinic and 36 (23%) did so. The majority had a postural backache which was not severe. Psychological factors were present in 14 women.**

***Conclusions*—Though new long term backache is reported more commonly after epidural analgesia in labour, it tends to be postural and not severe. There were no differences in the nature of the backache between those who had or had not received epidural analgesia in labour.**

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Introduction

The number of women choosing epidural analgesia in labour has steadily increased over the past 25 years. Until recently, relatively little research had been performed on the possible long term problems associated with epidural anaesthesia. MacArthur and her colleagues, in a survey of 11 701 women, found an increased incidence of long term backache in those women who chose epidural analgesia in labour.[1] It was postulated that the backache was postural, related to a combination of stressed positions in labour, muscular relaxation, effective analgesia and lack of mobility. However, no assessment of backache was made.

Backache is a problem that affects many people at some stage in life. Numerous disease processes cause backache, including inflammatory conditions, infections, developmental abnormalities, and mechanical and degenerative disorders. No study has investigated the nature of backache after childbirth. Our aim was to assess those women who had developed backache after childbirth and to look for any relation between backache and pain relief in labour or other factors.