visualised by the bladder and abdominal wall, which is especially advantageous in obese patients. The vaginal probe can be manoeuvred in several planes and circumferentially around the cervix for the optimal visualisation of adnexal structures in the focal zone.

Finally, tenderness can be assessed with the probe under direct vision. It is possible to distinguish tubal from ovarian tenderness, which pelvic examination would have lumped together as "adnexal tenderness." Bimanual examination with its attendant risks of rupturing an ectopic pregnancy* can thus be avoided.

In conclusion, transvaginal ultrasound offers distinct advantages over transabdominal scanning and may even render vaginal examination unnecessary.

1 Pederson JF. Ultrasonic scanning in suspected ectopic pregnancy. *Br J Radiol* 1980;53:1-4.
2 Norman RJ, Reddi K, Patel F, Kemp M, Joubert SM. Sensitive urine tests and human chorionic gonadotrophin secreted during ectopic pregnancy. *Br Med J* 1986;292:590-1.
3 Timor-Tritsch IE, Rottem S. Transvaginal ultrasonographic study of the fallopian tube. *Obstet Gynecol* 1987;70:424-8.
4 Scott JS. Abortion. In: Dewhurst J, ed. *Integrated obstetrics and gynaecology for postgraduates*. 3rd ed. Oxford: Blackwell Scientific, 1981:226.

(Accepted 27 October 1987)

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Shoe manufacture and possible hazards to reproduction

After our initial report on the risk of perinatal death associated with leatherwork¹ McDonald and McDonald reported similar results from Montreal.² We have now reviewed the past and subsequent obstetric histories of our initial study population.

Methods and results

The reanalysis was carried out in two parts. Firstly, we analysed the obstetric histories of the women studied before they were included in the initial study. The four groups were: leatherworkers who had suffered perinatal death, leatherworkers who had delivered live babies, other social class III (manual) women who had suffered perinatal death, and other social class III (manual) women who had delivered live babies. Secondly, in conjunction with the Health and Safety Executive, an employment nursing adviser interviewed all the leatherworkers, using a questionnaire designed to collect a complete occupational history together with details of any further pregnancies since their inclusion in the initial perinatal mortality survey. At the interview no particular emphasis was placed on either the obstetric history—that is, perinatal deaths or live births—or any particular occupation. In the main perinatal survey there was a 100% response, and in the subsequent interview the response rate was 28 of 34 (82%) in the perinatal death group and 14 of 18 (78%) in the live birth group. Almost all non-responders were those who had moved out of the area.

Previous obstetric histories in women leatherworkers and other social class III working women

	Other social class III manual workers		Leatherworkers	
	Perinatal	Live	Perinatal	Live
No of women in study	87	93	34	18
No (%) with history of any pregnancy	34 (39)	37 (40)	10 (29)	7 (39)
No of previous pregnancies:				
Alive and well	39	43	7	9
Involuntary loss*	19	17	7	4
Terminations	8	10	1	0
Total	66	70	15	13
No of previous pregnancies per woman	0.8	0.8	0.4	0.7
No of previous pregnancies per woman ever pregnant	1.9	1.9	1.5	1.9
Involuntary loss as % of all previous pregnancies	29	24	47	31
Alive and well pregnancies per woman	0.4	0.5	0.2	0.5

*Spontaneous abortions and perinatal deaths.

The table shows that in leatherworkers who had suffered previous perinatal deaths only 29% had a history of previous pregnancy compared with 39% or 40% in all other groups. The 36 perinatal deaths in our previous report occurred in 34 pregnancies.¹ The total number of "alive and well" pregnancies per woman was also much lower in the leatherworkers who had suffered previous perinatal deaths than in the other groups (table).

In these analyses the denominator used was the total number of women who had live births or deaths in the initial study. Non-responders in the subsequent interview were assumed in the analyses to have had no exposure to solvents or adhesives. The median number of years worked in the leather industry by women who had had previous perinatal deaths was 7.0 (range <1 to 20), whereas the median number of years in the group who had had live births was only 4.5 (range <1 to 10). Exposure to adhesives was reported in 62% of the perinatal death group and 50% in the live birth group. Similarly, work in the closing room of leatherwork factories, where solvents and glues are mainly used, was carried out by 71% of the perinatal death group and 61% of the live birth group.

In the group who had had previous perinatal deaths 16 women had had a further 25 pregnancies, giving a rate of 1.6 pregnancies per woman pregnant. In the group who had had live births nine women had had a further 10 pregnancies, giving a rate of 1.1 pregnancies per woman. There were no subsequent pregnancies that had led to a death or an abnormal baby in the live birth group, whereas there had been three deaths and one living birth with major congenital malformation in the perinatal death group.

Comment

Though the numbers in this reanalysis and resurvey are small, the findings from both the previous and subsequent obstetric histories seem to support the view that women in the boot and shoe industry may have been exposed to a fetotoxic agent.

We thank Dr R Randall for his advice on this work and Mrs Pamela Marshall for interviewing. The perinatal study is funded by the Leicestershire Health Authority.

1 Clarke M, Mason ES. Leatherwork: a possible hazard to reproduction. *Br Med J* 1985;290:1235-7.
2 McDonald AD, McDonald JC. Outcome of pregnancy in leatherworkers. *Br Med J* 1986;292: 979-81.

(Accepted 27 October 1987)

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Anaerobes and carcinoma of the prostate

Anaerobic bacteria are present in healthy people on all mucosal surfaces and can be isolated from the urine and periurethral region. Anaerobes may be associated with pyelonephritis, urethritis, renal abscess, prostatitis, and septicaemia.¹ Carcinomas of the bronchus, colon, and uterus are associated with anaerobic infections. The recorded incidence of prostatic carcinoma in men aged over 50 is between 14 and 46%.² We tested the hypothesis that anaerobes are associated with prostatic carcinoma.

Patients, methods, and results

Prostatic tissue was obtained from 33 unselected patients after transurethral or retropubic prostatectomy. Specimens were processed within 30 minutes or stored at 4°C for up to 20 hours. Tissue (1 g) was washed³ and then minced with a sterile technique before being rolled on to heated blood agar plates (5% horse blood) and blood agar plates with neomycin (28 mg/l). Heated blood agar plates were incubated at 37°C in 10% carbon dioxide, and blood agar plates with neomycin were incubated at 37°C anaerobically. The tissue was then transferred into 80 ml Fastidious Anaerobe Broth (Lab M, Bury, Lancashire) and subcultured after two and seven days' incubation at 37°C on to the two types of plates. Anaerobic bacteria were identified by the methods of Holdeman *et al*.⁴ Routine sections were classified by an independent observer as benign or malignant on histological examination. Clinical information, including age, whether preoperative antibiotics had been given, and presence or absence of a catheter, was obtained retrospectively from hospital case notes.

Histological examination showed that nine of the 33 samples of prostatic tissue contained foci of carcinoma; the remaining 24 showed only benign prostatic hyperplasia. Six of the nine malignant specimens and none of the 24 benign specimens grew anaerobes ($\chi^2=19.56$, $p<0.001$); in all six cases the specimens

had been processed within 30 minutes after resection. Similar proportions of benign and malignant tissue grew facultative bacterial species. There were delays of 16 and 20 hours in processing two malignant samples; neither of these grew anaerobes. The anaerobes isolated included anaerobic cocci (four samples), *Bacteroides distasonis* (one), and *Clostridium perfringens* (one). Anaerobes were isolated from only one specimen before broth enrichment.

Appreciable preoperative bacteriuria ($>10^5$ colony forming units/ml) had been present in four of the nine patients with malignant disease and five of the 24 with benign disease. Three and seven patients, respectively, had had catheters inserted preoperatively. Similar proportions in each group had received antibiotics preoperatively.

Comment

Malignancy may predispose patients to urinary tract infection and bacteraemia with anaerobes.⁵ Our study shows that prostatic malignancies may become colonised with anaerobes, although successful isolation of anaerobes from prostatic tissue requires prompt processing and enrichment in broth culture. Sources of the anaerobes include the periurethra after urinary reflux and the rectum after bacteraemia. Factors that may contribute to the colonisation of malignant tissue by anaerobes include reduced oxygen tension, reduced zinc content of prostatic secretions, and changes in cell surface receptors and mucins. The relative importance of these factors requires investigation.

1 Finegold SM. *Anaerobic bacteria in human disease*. New York and London: Academic Press, 1977:314-49.
2 Franks LM. Latent carcinoma of the prostate. *Journal of Pathology and Bacteriology* 1954;68:603-16.
3 Meares EM, Stamey TA. Bacteriologic localization patterns in bacterial prostatitis and urethritis. *Investigative Urology* 1968;5:492-518.
4 Holdeman LV, Cato EP, Moore WEC. *Anaerobe laboratory manual*. 4th ed. Blacksburg, Virginia: Virginia Polytechnic Institute and State University, 1977.
5 Finegold SM, Rosenblatt JE. Practical aspects of anaerobic sepsis. *Medicine (Baltimore)* 1973;52:311-22.

(Accepted 12 November 1987)

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Does infection with HIV affect the outcome of pregnancy?

Although the number of pregnant women known to be infected with human immunodeficiency virus (HIV) in the United Kingdom is small, this group has attracted considerable interest, particularly in the risk of infection and illness in the infant and the effect of pregnancy on the mother^{1,2}; there is little information about any possible effect on the pregnancy itself. One study from New York identified children who had already developed the acquired immune deficiency syndrome (AIDS) and reported details of the pregnancies that led to their birth.³ To our knowledge, however, the outcome of pregnancy in women identified as positive for antibodies to HIV has not been reported. Edinburgh has a sizable population of intravenous drug users, who have a high prevalence of HIV seropositivity.⁴ We present details of the outcome of pregnancy in all women identified as positive for antibodies to HIV and in women who had a history of drug abuse or a partner known to be seropositive but who were themselves negative for HIV antibody.

Patients, methods, and results

We identified pregnant women tested for antibody to HIV up to June 1987. Our main sources were the two virus laboratories that carry out all HIV testing in the Edinburgh area. Antibody to HIV was detected by commercial assays performed according to the manufacturers' instructions, and positive results were confirmed by a different assay. Two difficult samples (4% of those yielding positive results) were examined by immunoblotting.
HIV state was known for 205 pregnant women. In most cases it was determined during pregnancy, but in 23 (nine seropositive patients) it was determined retrospectively. Seropositivity was found only in women who had been intravenous drug users or whose partner was known to be seropositive. We studied 50

Outcome of pregnancy by result of test for antibody to HIV

	Positive for HIV	Negative for HIV	Total
Total No of pregnancies	61	75	136
No of spontaneous abortions	11*	4	15
No of induced abortions	16	12	28
No of continuing pregnancies	4	5	9
No of pregnancies resulting in live births (No of babies)	30 (31)	54	84 (85)
No (%) of babies born at <37 weeks' gestation	5/31 (16)	8/54 (15)	13/85 (15)
No (%) of babies born weighing <5th centile ⁵	4/29† (14)	7/54 (13)	11/83† (13)
No (%) of babies weighing <2500 g	7/31 (23)	12/54 (22)	19/85 (22)
No with prematurity resulting in neonatal death or severe handicap	1	1	2

*t=2.43, p<0.02. All other differences between seropositive and seronegative groups not significant.
†No centile charts available for twins.

women who were seropositive (46 intravenous drug users, four with a seropositive partner) and 64 who were seronegative (45 had used intravenous drugs since 1983, 19 had a seropositive partner). These women tended to be young and unmarried and to smoke heavily. They tended to live in areas of the city with multiple deprivation, and both they and their partners tended to be unemployed.
The table shows an apparent increase in spontaneous abortion in the seropositive group, but this may be due to differences in ascertainment as the incidence in the seronegative group was low. Premature delivery, intrauterine growth retardation, and low birth weight were common compared with rates in the total population in Edinburgh (the incidence of preterm labour was 6.6% and of low birth weight 6.3% in Edinburgh in 1984). Seropositive and seronegative women did not differ from each other in these variables.

Comment

The study population was characterised by features of lifestyle and deprivation that would be expected to have an adverse effect on pregnancy. Compared with rates in the total population of Edinburgh, the rates of prematurity and intrauterine growth retardation were increased more than twofold and the rate of low birthweight babies was increased nearly fourfold, though the one twin pregnancy contributed to this. Of the singleton babies, one died neonatally, one died within three months, and one survived but was handicapped. Adverse outcome was equally distributed between the seropositive and seronegative women, and there was no suggestion that infection with HIV itself had any effect. Major medical or obstetric disease was uncommon, and the rate of obstetric intervention was low.
There is no evidence from this small study that infection with HIV per se affects the outcome of pregnancy. All these women, however, were well, and this information may not apply to pregnant women who have symptomatic illness.

We thank Dr Sue Cole for providing data on pregnancies in Edinburgh, Dr Robin Prescott for advice on statistics, and Dr Jacqueline Mok, Dr George Bath, and Dr Roy Robertson for their interest and help.

1 Mok JYQ, Giaquinto C, Grosch-Warner I, *et al*. Infants born to HIV seropositive mothers—preliminary findings from a multivariate European study. *Lancet* 1987;ii:1164-7.
2 Scott GB, Fischl MA, Klimas N, *et al*. Mothers of infants with the acquired immunodeficiency syndrome. Evidence for both symptomatic and asymptomatic carriers. *JAMA* 1985;253:363-6.
3 Minkoff H, Nanda D, Menez R, Fikrig S. Pregnancies resulting in infants with acquired immunodeficiency syndrome or AIDS-related complex. *Obstet Gynecol* 1987;69:285-7.
4 Robertson JR, Bucknall ABV, Welsby PD, *et al*. Epidemic of AIDS related virus (HTLV-III/LAV) infection among intravenous drug users. *Br Med J* 1986;292:527-9.
5 Smalls MJ, Forbes JF, Cole SK. *Centile values of birthweights for gestational age in Scottish infants 1975-1979*. Glasgow: Social Paediatric and Obstetric Research Unit, University of Glasgow, 1982.

(Accepted 23 December 1987)

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