relative risk for the patients with sickle cell disease was 0·9.

The two groups of children were categorised according to whether their alanine aminotransferase activity was 0-55, 56-100, or >100 IU/l (table). None of the differences in the proportions in the three categories between the two groups was significant ($p>0·1$ in all categories, Fisher's exact two tailed test).

Comment

These findings indicate that exposure to hepatitis B virus is not increased in children with sickle cell disease who have received several transfusions of unscreened blood. This may be either because most donors have been infected early in life and so tend not to be infectious[3] or because a high proportion of the recipients (a third in our study) have also been exposed to the virus and therefore have a reduced risk of being infected by the transfusion. There was little indication, based on alanine aminotransferase activity, that transmission of hepatitis C would be of concern in either of the groups.[4]

Thus in Cameroon, for the time being, screening blood for hepatitis B surface antigen before transfusion cannot be justified.[2,5] A surveillance scheme should, however, be set up to monitor the incidence of hepatitis after blood transfusion and the relevance of this guideline.

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Aetiological importance of ovulation in epithelial ovarian cancer: a population based study

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One of the principal theories on the aetiology of ovarian cancer suggests that incessant ovulation induces malignant transformation by traumatising the ovarian epithelium.[1] This hypothesis agrees with the epidemiological studies that show an increased risk of ovarian cancer in nulliparous women and in women with extended ovulatory life spans.[2] Similarly, suppression of ovulation and the reduction in the total number of times that ovulation occurs in women taking the contraceptive pill, those who have repeated pregnancies, and those who breast feed are associated with a reduced incidence of ovarian cancer.[2,3] In women ovulation occurs significantly more often in the right ovary (65%), and a similar phenomenon occurs in rhesus monkeys.[4] Thus if ovulation was aetiologically important in epithelial ovarian cancer the disease would be expected to arise more commonly in the right ovary.

Patients, methods, and results

Grampian region has a stable population, and all new cases of ovarian cancer are registered with the gynaecological oncology unit by the Grampian oncology research project. All women with ovarian cancer have separate standardised case records, and I used these in a population based study to assess the proportion of epithelial ovarian cancer arising in each ovary.

From January 1983 to June 1988, 220 patients with ovarian cancer were registered. Six were excluded because they had non-epithelial ovarian cancer, leaving 214 cases for analysis. The mean age of the group was 60 (range 21-89). Forty eight patients had stage I disease, 31 stage II, 84 stage III, and 51 stage IV.

Significantly more tumours were found on the right side than on the left (59% *v* 41%), the 95% confidence interval for tumours on the right being 51% to 67% (table). There was no difference in age distribution or the distribution of epithelial subtypes between the patients with right sided tumours and those with left sided tumours. The distribution of stage was, however, significantly different ($\chi^2=5·13$, df=1, $p<0·05$). Altogether 60% (38/63) of the patients with left sided tumours presented with disease at an early stage (stages I and II). In contrast, 58% (53/91) of those with right sided tumours presented with disease at a late stage (stages III and IV).

Side of origin of epithelial ovarian cancer in 214 women

Side of origin of tumour	No
Right unilateral	57
Left unilateral	45
Right dominant (bilateral)	34
Left dominant (bilateral)	18
Undetermined	60

For right unilateral and right dominant (bilateral) *v* left unilateral and left dominant (bilateral) $Z=2·2561$, $p<0·05$.

Comment

To my knowledge this is the first study to show that epithelial ovarian cancer arises more commonly in the right ovary. This finding, together with the evidence that ovulation occurs more commonly in the right ovary, supports the epidemiological data implicating incessant ovulation in the pathogenesis of epithelial ovarian cancer.[1,3,4] It also lends support to Fishel's and Jackson's concern about the potential risk of ovarian cancer from the excessive stimulation of follicles associated with assisted fertility, when the number of ovulating follicles in a single stimulated cycle may be equivalent to the product of up to two years of natural cycles.[5]

The incidence of and mortality from ovarian cancer, unlike those associated with gynaecological malignancies, are rising. The current methods of potent follicular stimulation are unlikely, however, already to be having an adverse effect as they have been widely available for only the past five years. If ovulation is aetiologically important in epithelial ovarian cancer the proliferation of superovulation would be expected to lead to a shift to the left in the age related incidence of and mortality from the disease.

The findings of this study depend on the assumption that in bilateral disease the side with the larger tumour is the side from which the tumour developed. Although this seems a reasonable assumption, it is not supported by any direct evidence. It is difficult, however, to explain why in bilateral disease the right ovary is more commonly larger than the left. The large number of tumours in this study for which the side of origin was undetermined can be explained by the natural course of this disease; the side was truly indeterminable.

The observation that patients with tumours of the left ovary present at an earlier stage than those with

tumours of the right ovary is interesting. Possibly the endocrinological environment of the more frequently ovulating right ovary has an adverse effect on metastatic potential.

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Risk of HIV infection among clients of the sex industry in Scotland

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Concern about the connection between prostitution and sexually transmitted diseases has been heightened by the AIDS epidemic and by the fact that some of those who buy and sell sexual services are heavy users of alcohol and illicit drugs.[1-3] To examine the risks of HIV infection in relation to the sex industry a research project was initiated in Edinburgh; it was conducted among both those buying and those selling sexual services.

Subjects, methods, and results

A client was defined as someone who had paid for physical sexual services, and a sex worker as a person who provided such services for payment. This study elicited data from both clients and sex workers. The information obtained from the sex workers has been described elsewhere.[2-4]

Data on over 300 variables were elicited from clients by an interview. Respondents were contacted by a "snowballing" technique, whereby 10 interviewers approached sex workers who had been contacted earlier,[2] who introduced them to clients. The clients were not a representative group, and this method probably resulted in well known or regular clients being overrepresented. This paper relates to 209 clients who were interviewed during 1988 and 1989.

Two hundred and six of those interviewed were men and three were women. Their age range was 18-60. The mean age of the men was 33·2 years and that of the women 27·7 years. One hundred and seventy two of the male clients reported having contacted only female sex workers, 26 had contacted only male sex workers, and five had contacted both male and female sex workers. Two of the female clients had contacted male sex workers and the third had contacted both male and female sex workers. The number of different sex workers whom clients had reportedly contacted in the previous year ranged from one to 100 (median=5, mode=3). Only 21 reported having contact with only one, regular sex worker.

One hundred and twenty one clients reported that they asked to use condoms for penetrative intercourse. About a third of clients who had contact with male sex workers sometimes refused to use condoms. Only one in eight of the clients of female sex workers reported refusing to use condoms. Men having anal sex with male sex workers reported a higher level of use of condoms than did men who had anal intercourse with female sex workers (table). Almost a third of the study group reported that they had paid more for unprotected than for protected sex. Of those who used condoms, male clients of male sex workers and clients of both male and female sex workers were more likely than clients of only female sex workers to report failure of condoms (10/17 and 1/2 respectively *v* 11/92). In contrast, only a quarter of respondents (23/87) who reported having a regular unpaid sexual partner reported using condoms with that person.

Use of condoms during penetrative intercourse with sex workers in previous year. Figures are estimated numbers (percentages) of occasions when condoms were used

	Male clients		
	Male sex worker (n=21)	Female sex worker (n=167)	Female clients (n=2)
Anal intercourse	618/685 (90·2)	31/130 (23·8)	30/31 (96·8)
Vaginal intercourse	Not applicable	2008/3249 (61·8)	No data

Twenty six respondents (25 men, one woman) reported having injected drugs, of whom 16 reported having shared injecting equipment after 1980.

Fifty four respondents reported having been tested for HIV infection, of whom seven stated that the result had been positive. All seven had injected drugs.

Comment

These results are broadly consistent with information from studies of sex workers in several countries.[3] A study of clients of sex workers in Birmingham also found that about a third reported having persuaded sex workers to engage in unprotected intercourse (H Kinnell, unpublished data).

Sex workers and their clients are important targets for information on preventing HIV infection. Strategies must be implemented to impart health education to these people. Action is also urgently needed to increase the availability of strengthened condoms for anal intercourse. There is little evidence that HIV infection in developed countries has been spread by prostitution. Even so, evidence suggests that there is a risk not only of sex workers infecting clients but also of clients infecting sex workers.

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