advised that children should attend school as normal, and no child was thought to be sufficiently unwell, as a result of oil fumes, to be unable to attend school (C M Rowlands, personal communication).

Comment

The strong odour due to the high aromatic content of the light crude oil and the obvious surface contamination made parents worried about an increase in respiratory disorders, especially asthma, in their children. These fears were exacerbated by environmental pressure groups² and lack of published information about the effect of crude oil vapour and droplet spray on an exposed population.

In the short term it seems that their fears have not been realised. Firstly, odour bears no relation to toxicity, and with certain compounds the human nose can discern an odour at concentrations below that

which can be measured. Also, the airways and lower respiratory tract may have been partly protected as most of the oil droplets would have been sufficiently large to have been filtered out by the nose and throat (P Leinster, personal communication). Since exposure to hydrocarbon vapour was relatively short and the highest concentration was equivalent to that normally found by the roadside in many cities (P Leinster, personal communication) no permanent harm may have resulted, but follow up studies are required.

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Effect of medical audit on prescription of palliative radiotherapy

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External beam radiotherapy is valuable in treating many of the symptoms of advanced cancer. Around half of the patients treated in clinical oncology departments receive palliative (as opposed to radical) radiotherapy,¹ and most of them have inoperable lung cancer or painful bone metastases. The symptomatic benefits of palliative radiotherapy for these two groups of patients have been confirmed in prospective studies, which have also shown that fewer high dose fractions of treatment are as effective as and no more toxic than more lengthy fractionated courses of treatment.^{2,3}

Shorter courses of radiotherapy have the advantage of being more convenient for the patient and more cost effective. Many clinical oncologists are, however, reluctant to change their prescribing on the basis of these studies.⁴ A recent survey showed an enormous variation in the prescription of palliative treatments.⁵ We examined the effect of medical audit on the prescription of radiotherapy by clinical oncologists in our centre for these two patient groups.

Patients, methods, and results

We reviewed the case notes of patients given radiotherapy for painful bone metastases during two weeks in November 1990 and of patients given palliative radiotherapy for inoperable lung cancer during two weeks in January 1991. Data on patients and fractionation schedules were recorded and presented at two medical audit meetings to all consultants and junior staff. After discussion of the two prospective studies^{2,3} we circulated memoranda to all medical staff suggesting that in most cases patients with painful bone metastases should be given a single fraction of radiotherapy (6-8 Gy) and those with inoperable lung cancer two fractions of treatment one week apart (total dose 17 Gy) in line with the published data.³

One year later we reviewed the case notes of all patients given radiotherapy for bone metastases in November 1991 and of those similarly treated for inoperable lung cancer in January 1992. Fractionation schedules were recorded and reasons sought if prescribing practices differed from those that had been recommended. The χ^2 test was used to compare

numbers of patients treated with the different fractionation schedules.

The four groups of patients were distinct and not significantly different for the two conditions in terms of age, stage of disease, or histological type. The same group of medical staff was responsible for the treatment of all of them.

The first survey showed that the majority (62% (95% confidence interval 50% to 74%)) of patients receiving palliative radiotherapy for painful bone metastases were treated with five or more fraction courses of treatment (table). One year later a significant change in prescribing practice was noted: 27% (18% to 38%) of the total number of treatments were given in five or more fractions (table, $p < 0.001$). The change was less pronounced for patients given radiotherapy for the palliation of advanced lung cancer, 79% (65% to 93%) of treatments being given in five or more fractions in January 1991 compared with 52% (40% to 64%) in January 1992 (table, $p < 0.05$).

The case notes gave a specific reason for choosing a multiple fraction regimen in only three cases (all of carcinoma of the bronchus): previous endobronchial radiotherapy, the use of large field sizes, and an attempt to maximise palliation in a patient with a Pancoast's tumour. The choice of fractionation regimen for both groups of patients was apparently independent of tumour type, the patient's age, or inclusion of the spinal cord within the treated area. Prescription practice, however, varied widely between doctors in this centre. A few clinicians used one or two

Palliative radiotherapy in patients with bone metastases or inoperable lung cancer. Values are numbers (percentages) of patients unless stated otherwise

	Bone metastases		Lung cancer	
	Nov 1990*	Nov 1991	Jan 1991*	Jan 1992
No of patients	68	76	33	56
No of treated sites†	72	89	33	56
No of fractions:				
1	22 (32)‡	51 (67)‡	2 (6)	8 (14)
2	2 (3)	1 (1)	4 (12)	18 (32)
3	1 (1)	1 (1)	1 (3)	1 (2)
4	1 (1)	2 (3)	—	—
5	36 (53)‡	17 (22)	23 (70)	24 (43)
6	2 (3)	1 (1)	—	2 (4)
8	—	—	1 (3)	1 (2)
10	4 (6)	3 (4)	2 (6)	2 (4)

*Two week period.

†All patients who received radiotherapy to more than one site (in Nov 1990 two patients had two sites treated, one had three sites treated; in Nov 1991 13 patients had two sites treated) received the same number of fractions to each site with the exception of one patient (marked ‡).

‡One patient received a five fraction course of radiotherapy to two sites of bone pain and a single fraction of radiotherapy to a third site. She is included in the five fraction group for statistical analysis.

§Includes five patients who received wide field hemibody radiotherapy.

fractions of palliative radiotherapy for these two conditions before the audit and their practice did not subsequently change and a few continued to use five or more fractions despite the recommendations of audit. We noted, however, that most changed their prescribing practices after the first audit meeting.

Comment

We found that the number of fractions of palliative radiotherapy used to treat bone metastases and advanced lung cancer in this centre has fallen over the past two years. There is currently much interest and discussion about fractionation patterns in palliative radiotherapy and therefore we cannot state categorically that medical audit directly resulted in the changes in palliative fractionation regimens used at this centre. Nevertheless, medical audit helped to establish

consensus guidelines for prescribing palliative radiotherapy for these two patient groups and the presentation of data on fractionation and the dissemination of information as a consequence of audit probably resulted in some change in clinical management.

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Teenagers, sex, and risk taking

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Medical problems associated with teenage sexual activity are increasing, including teenage pregnancies and complications from sexually transmitted disease.¹ *The Health of the Nation* targets have brought these topics under scrutiny. This study is a baseline examination of teenage relationships and part of an evaluation of a health and sex education programme.

Subjects and methods

In spring 1991, 1025 students in year 11 (aged 15-16) completed a questionnaire relating to sex education in nine schools in both the state and independent sectors in south west England. After completing this questionnaire volunteers were requested to take part in a further study the following year. From this group 429 volunteered and, having received a preparatory letter in spring 1992, 350 agreed to answer a further questionnaire. A total of 315 questionnaires (90%) were returned.

The follow up questions asked about knowledge of sexually transmitted disease, if and at what age the respondents had first had intercourse, whether they had ever had sex without using contraception, whether they had sex during a "one night stand" or in a relationship lasting only a few days, and if they knew any close friends who had contracted a sexually transmitted disease.

Relative risk ratios and 95% confidence limits were calculated for positive responses to these questions according to sexual activity before or after age 16.

Results

The respondents to the postal questionnaire included more girls than the original school group (223 (71%) compared to 509 (50%)) and respondents tended to be more academically inclined (taking on average 8.3 subjects for the General Certificate of Secondary Education compared with 7.8 for the remainder of the sample) but there were no differences in social class groupings. The average age of the sample was 16.9 years (range 16.5 to 17.5); 54% were sexually active, 84 having had sex under 16 and 84 between their 16th birthday and the questionnaire.

The table shows the responses to the questions. Those who had sex before 16 were almost twice as likely to have had sex at some time without using contraception (relative risk 1.86; 95% confidence interval 1.33 to 2.60); they were twice as likely to have had sex within a short relationship (2.24; 1.38 to 3.62);

and three times more likely to know a close friend with a sexually transmitted disease (2.97; 1.55 to 5.70). Only seven (5%) of the non-sexually active teenagers knew a close friend with a sexually transmitted disease.

Responses to questionnaire on sexual behaviour of 16 year olds. Values are numbers (percentages)

	Total sample (n=315)	Sexually active	
		Before 16 (n=84)	After 16 (n=84)
Having sex without contraception	83 (26)	54 (64)	29 (35)
Sex within a short relationship*	59 (19)	39 (46)	20 (24)
Knowing a "close friend" with a sexually transmitted disease	46 (15)	29 (35)	10 (12)

*"One night stand" (44 responses); "a relationship that lasted only a few days" (15 responses).

Comment

This survey is from a group of teenagers who responded to a follow up postal questionnaire. Their level of sexual activity before 16 is marginally lower than that quoted from surveys within the same geographical area.² Despite this those starting sex under 16 exhibited a high degree of risk taking, including having sex without using contraception and in short term relationships, consistent with increasing rates of unwanted pregnancy.¹ The high level of sexually transmitted diseases that this group says exists among their peers is of further concern.

Although the younger teenagers in this study have had a longer sexual history, the results support previous data indicating that young teenagers are more likely to expose themselves to risks and less likely to use contraception effectively than their older counterparts.³ This has been suggested to relate to the level of cognitive development of younger teenagers, which tends to preclude them from taking effective action despite the knowledge of risk.⁴ Even when contraceptives are supplied within schools many young teenagers do not obtain them until after they have become sexually active.⁵ Perhaps it is the age of first intercourse that is the critical factor.

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