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Editorials

633 Ectopic pregnancy
John Newton

635 Genes on the X and Y chromosomes controlling sex
M A Ferguson-Smith

636 Sickness absence: the doctor's role
D Coggon

637 Counsellors in general practice
Edwin Martin

638 Smoking and leukaemia
Nicholas Wald

News

639-642 Black nurses · Chemical castration · Hammersmith plans · Motor neurone disease · Irish general practitioners · Medical negligence · Single homeless · Choose science · Antioncogenes

Papers

643 Langerhans' cells and subtypes of human papillomavirus in cervical intraepithelial neoplasia
Robert J S Hawthorn, John B Murdoch, Allan B MacLean, Rona M MacKie

647 Fluorescent lights, ultraviolet lamps, and risk of cutaneous melanoma
A J Swerdlow, J S C English, R M MacKie, C J O'Doherty, J A A Hunter, J Clark, D J Hole

650 Evaluation of a proposed breast cancer screening regimen
E G Knox

654 Outcome of untreated infection with *Entamoeba histolytica* in homosexual men with and without HIV antibody
Erica Allason-Jones, Adrian Mindel, Peter Sargeaunt, David Katz

657 Leukaemia and smoking habits among United States veterans
L J Kinlen, E Rogot

660 Exercise induced rhinorrhoea (athlete's nose)
C F Stanford, R L Stanford

660 Acute laryngeal stridor with respiratory arrest in drug induced systemic lupus erythematosus
W K Chong, A G Dewhurst, J R E Dathan

661 Reduction of size of thyroid with radioactive iodine in multinodular non-toxic goitre
Laszlo Hegedüs, Bo Mølholm Hansen, Niels Knudsen, Jens Mølholm Hansen

662 Review of postperinatal mortality in a health district with a garrison town
Mala Rao, Elizabeth Hoinville

646 Correction: Screening tests for hepatitis B
Saha *et al*

Practice Observed

663 Randomised controlled trial of general practitioner intervention in patients with excessive alcohol consumption
Paul Wallace, Stephen Cutler, Andrew Haines

Middles

669 BACUP—the first two years; evaluation of a national cancer information service
M L Slevin, Y Terry, N Hallett, S Jefferies, S Launder, R Plant, H Wax, T McElwain

672 Graphical aid for determining power of clinical trials involving two groups
Douglas K Miller, Sharon M Homan

677 ABC of Eyes: The glaucomas
A R Elkington, P T Khaw

676 Corrections: The eye and the nervous system; General medical disorders and the eye
Elkington and Khaw

681-696 Obituary · Correspondence · Medicine and Books · Medicine and the M A · Opinion · Personal View · Minerva · (in *detail* overleaf)

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Smoking and leukaemia

Leukaemia commoner among smokers but why?

Cigarette smoking has been so extensively researched and linked to so many different diseases that there is an initial sense of disbelief at the suggestion that it may cause yet another disease—namely., leukaemia. That the possible link has not received much attention is not surprising because only a few prospective studies of smoking are large enough to detect even a 100% increase in the risk of leukaemia in smokers, and many case-control studies of leukaemia have not obtained information on smoking.

In 1985 Austin and Cole reviewed the epidemiological evidence and suggested that there was an association between smoking and leukaemia, especially acute myelocytic leukaemia.[1] They said that confirmation was needed, and since then confirmation has been found. A case-control study showed that cigarette smoking was associated with a significantly increased risk of acute myelocytic leukaemia (relative risk 1·78, 95% confidence interval 1·01 to 3·15).[2] Now Kinlen and Rogot report the largest prospective study smoking and leukaemia (p 657). It provides the results of 16 years of follow up from the United States veterans study (eight years longer than was available to Austin and Cole in their review) and includes details of the type of leukaemia. The study shows a significant increase in the risk of leukaemia associated with smoking (relative risk 1.53, $p<0·005$) together with a dose-response relation' between cigarettes smoked and risk; the relative risks were 1-34, 1-56, and 1.59 for people smoking less than 10, 10 to 20, and more than 20 cigarettes daily. Again the strongest effect was found for leukaemia of the myeloid and monocytic types.

The association between smoking and leukaemia is undoubtedly real, but is it one of cause and effect? Could it be an artefact of diagnosis? Metastatic lung cancer, for example, producing leucoerythroblastic cells in the peripheral blood, might be misdiagnosed as leukaemia. This type of error is unlikely to have occurred often enough however, to account for the observed relative risk. Associations with a relative risk of about 1·5 may be due to an indirect association: smoking may thus be associated with some other (confounding) factor that is itself associated with leukaemia. But identifying such a factor is difficult. Consumption of alcohol, for example, is greater in smokers than in non-smokers but is not known to cause leukaemia. Social class would if anything tend to mask the association between smoking and leukaemia as leukaemia is more common in social class I (professional occupations) but smoking is more common among people in partly skilled and unskilled occupations. If the association is one of cause and effect no mechanism has been identified. Benzene and Benzene and ionising radiation cause leukaemia in man, and tobacco smoking is a source of both—but in quantities so small that they are unlikely to make any material contribution to' the excess risk of leukaemia in smokers.

Whatever the mechanism, the balance of evidence suggests that smoking may cause leukaemia. This cancer can now be added to the list of tobacco related causes of death summarised by the World Health Organisation,[3] including it along with diseases such as bladder cancer in the category "diseases for which the excess mortality in smokers may be partly or wholly attributable to smoking".

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