Comment

An early feature of Lyme disease is the distinctive erythema chronicum migrans. Bateman and Lawton described nine patients with Lyme disease who had unilateral or bilateral facial nerve palsies, and in three of these the palsy was associated with this skin lesion.[2] The induration and erythema seen in my patients may have been those of erythema chronicum migrans.

Seven of the patients described here developed swelling and erythema of the face of varying severity that started before the facial nerve palsy. The appearances resembled those of cellulitis, but the affected skin was not painful or tender to touch. In addition, erythema of the tympanic membrane on the affected side was noted in two of these patients. These clinical features have not been reported in Bell's palsy.

I recommend that a presumptive diagnosis of Lyme disease should be made in any patient presenting with a facial nerve palsy that is associated with induration and erythema of the face. The diagnosis becomes more probable if the patient presents in the summer and lives in, or has visited, an area in which the vector may be found. Treatment with an antibiotic should be started as soon as Lyme disease is suspected, rather than be delayed until the diagnosis has been confirmed by serological tests, because prompt treatment may hasten recovery from what would otherwise be a disfiguring complaint lasting several months.

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2 Bateman D, Lawton NF. The neurological complications of Borrelia burgdorferi in the New Forest area of Hampshire. *J Neurol Neurosurg Psychiatry* 1988;51:699-703.

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Cholesterol screening programmes: How much potential benefit?

Kay-Tee Khaw, Geoffrey Rose

Clinical Gerontology Unit, University of Cambridge, Addenbrooke's Hospital, Cambridge CB2 2QQ
Kay-Tee Khaw, MRCP, *professor*

Department of Epidemiology and Population Studies, London School of Hygiene and Tropical Medicine, London WC1E 7HT
Geoffrey Rose, DM, *professor*

Correspondence to:
Professor K-T Khaw, University of Cambridge School of Clinical Medicine, Cambridge.

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Despite many guidelines set out by several committees programmes for screening the cholesterol concentrations of the population and subsequent treatment of people with high concentrations remain controversial. Recommendations range from no screening to screening all adults before age 30.[1] The definition of high risk groups for selective screening varies and has not been examined systematically.[1,2] Failure to distinguish between relative and absolute risks and benefits in some guidelines may have resulted in inappropriate recommendations.

We quantified the potential benefits of a programme for screening the population of England and Wales in terms of preventing deaths from coronary heart disease.

Methods

We used data from the Office of Population Censuses and Surveys for England and Wales in 1985 that were stratified by sex and age[3] to calculate the expected numbers of deaths from coronary heart disease over five years. We assumed that they had been screened and that drugs had been prescribed over five years for all people with concentrations $\geq 6{\cdot}5$ mmol/l, and that compliance was 100%. We used prevalences of cholesterol concentrations $\geq 6{\cdot}5$ mmol/l obtained from the Scottish Monica survey[4] and relative risks approximated from prospective studies[5] to estimate the number of deaths from coronary heart disease over five years in people with cholesterol concentrations $\geq 6{\cdot}5$ mmol/l. We then calculated the number of deaths that would have been prevented if all people with such concentrations had been treated, assuming a 20% reduction in mortality from coronary heart disease in all age and sex groups.

We then derived prevalences of cholesterol concentrations $\geq 6{\cdot}5$ mmol/l specific to age and sex assuming that the mean cholesterol concentration in the population was decreased by 0·5 mmol/l,[3] and, assuming that mortality was the same in people with each cholesterol concentration, estimated the potential reduction in numbers of deaths from coronary heart disease with these prevalences.

Results and Comment

Even assuming a fixed relative risk for high cholesterol concentrations and a fixed relative benefit for treatment in people in all age and sex groups, the absolute benefit of screening for individual people and the community varies enormously. For individual people the absolute benefit depends on the incidence of coronary heart disease, for which age and sex are important determinants. To prevent one death from coronary heart disease within five years estimates of the numbers of people who would have to be screened over the five years and of those who would subsequently be treated ranged from 137 320 and 20 600 respectively for

Estimates of potential benefits of cholesterol screening and subsequent treatment for preventing deaths from coronary heart disease in population of England and Wales in 1985[4] according to age and sex.

	Age (years)			
	25-34	35-44	45-54	55-64
Total population (1000s):				
Men	3 497·1	3 377·2	2 749·3	2 671·9
Women	3 433·0	3 349·2	2 735·3	2 727·4
Cumulative total No of deaths after five years:				
Men	1 660	11 098	41 085	104 968
Women	305	1 683	9 225	38 936
Prevalence (%) of cholesterol $\geq 6{\cdot}5$ mmol/l:				
Men	20	35	40	45
Women	15	20	50	70
No with cholesterol $\geq 6{\cdot}5$ mmol/l (1000s):				
Men	699·4	1 182·0	1 099·7	1 202·4
Women	515·0	669·4	1 367·7	1 909·2
Relative risk of death (cholesterol $\geq 6{\cdot}5$ mmol/l *v* $< 6{\cdot}5$ mmol/l):				
Men	4·0	3·0	2·0	1·5
Women	4·0	3·0	2·0	1·5
No of deaths in people with cholesterol $\geq 6{\cdot}5$ mmol/l:				
Men	830	6 855	23 477	57 840
Women	120	721	6 150	30 284
No of deaths prevented within five years*:				
Men	166	1 371	4 695	11 568
Women	25	144	1 230	6 057
No screened to prevent one death within five years:				
Men	21 067	2 463	586	231
Women	137 320	23 244	2 224	450
No treated for five years to prevent one death within five years:				
Men	4 213	862	234	104
Women	20 600	4 649	1 112	315
Deaths prevented within five years as % of total deaths in each age and sex group†:				
Men	10	12	11	11
Women	8	9	13	16
Prevalence (%) of cholesterol $\geq 6{\cdot}5$ mmol/l if concentrations of population lowered by 0·5 mmol/l‡:				
Men	10	20	25	25
Women	5	10	35	55
No with cholesterol $\geq 6{\cdot}5$ mmol/l (1000)‡:				
Men	349·7	675·4	687·3	668·0
Women	171·7	334·7	957·4	1 500·1
No of deaths over five years in people with cholesterol $\geq 6{\cdot}5$ mmol/l‡:				
Men	415	3 917	14 672	32 133
Women	84	360	4 305	23 970
Reduction in No of deaths over five years with lower prevalence of cholesterol $\geq 6{\cdot}5$ mmol/l‡:				
Men	415	2 938	8 805	25 707
Women	36	361	1 845	6 314
Reduction of deaths over five years as % of total deaths in each age-sex group with lower prevalence of cholesterol $\geq 6{\cdot}5$ mmol/l‡:				
Men	25	26	21	24
Women	12	21	20	16

* If treatment of those with cholesterol $\geq 6{\cdot}5$ mmol/l reduces mortality by 20%.
† Assuming 100% compliance.
‡According to prevalences if cholesterol concentration of population lowered by 0·5 mol/l

women age 25-34 to 231 and 104 respectively for men aged 55-64.

The prevalence of the risk factor is an additional important determinant of the potential benefit of screening for the community. This ranged from the prevention of 25 deaths from coronary heart disease over five years in women aged 25-34 to the prevention of 11 568 deaths in men aged 55-64. Reducing the mean cholesterol concentration of the population by 0·5 mmol/l by reducing the prevalence of high concentrations could reduce the mortality from coronary heart disease by 22%—about twice the reduction obtained with the strategy of screening and treatment.

These results are illustrative not definitive. Rates of coronary heart disease and prevalences of high cholesterol concentrations differ in different groups of people and blanket recommendations based on relative risks alone are inadequate. We did not consider cost effectiveness or other potential benefits or risks of screening and treatment. We believe, however, that this approach to examining data on high cholesterol concentrations may be of value in highlighting not only points of qualitative uncertainty, such as local prevalences of high cholesterol concentrations and the mortality associated with a given concentration but also, more importantly, points of qualitative uncertainty, such as the long term benefits and risks of treatment that lowers cholesterol concentration and what these are in groups not studied in trials—that is, women and certain age and ethnic groups.

1 Leitch D. Who should have their cholesterol concentration measured? *Br Med J* 1989;**298**:1615-6.
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4 Office of Population Censuses and Surveys. *Mortality statistics: cause; 1985, England and Wales.* London: HMSO, 1987. (DH2 No 12.)
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Immunisation against hepatitis B among NHS staff in West Midlands Regional Health Authority

Michael R Baddick, Tar-Ching Aw

Central Birmingham Health Authority, District Offices, Birmingham B15 2TZ
Michael R Braddick, MRCP, *registrar in public health medicine*

Institute of Occupational Health, University of Birmingham, Birmingham
Tar-Ching Aw, FFOM, *senior lecturer in occupational medicine*

Correspondence and requests for reprints to: Dr Braddick.

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Infection with hepatitis B virus is a rare but serious occupational hazard for health workers.[1] Since a vaccine was developed in 1981 demand for immunisation of health workers has increased.[2] The cost of the vaccine (about £32) and the many staff who might be considered for immunisation have, however, limited the numbers who have received it.[2] We performed a survey of the programme of immunisation against hepatitis B in the West Midlands region.

Methods and results

In November 1988 we sent a questionnaire to the occupational health department in each district in the West Midlands region asking for details of the immunisation programme. All 22 departments replied.

Four districts had started immunising staff in 1984-5, five in 1986, six in 1987, and five in 1988, and two were about to start. Of the 20 departments immunising staff, only 12 were able to state accurately the number who had been (or were being) immunised; the others gave estimates. The two departments with computerised records were able to state how many staff were at risk, whereas only one of the 18 with manual records could do so. The number of staff immunised in a district ranged from 50 to 1742 (median 351) and was related to the length of time the programme had been running: a mean of 810, 528, 208, and 197 staff had been immunised in the districts that had started their programmes in 1984-5, 1986, 1987, and 1988 respectively. Other staff had probably been immunised by their general practitioner without informing the occupational health department.

Thirteen of the 20 departments stated that the number of staff immunised was limited by financial considerations (two declined to answer this question). In one district immunisation of 700 staff had been deferred because of insufficient funds.

Comment

Despite a regional policy, which was issued in October 1987, the numbers of health workers immunised against hepatitis B varied considerably among the districts. Although the figures are hard to interpret without knowing the number of staff at risk in each district, it seems unlikely that adequate numbers of staff at risk have been immunised in all districts.

The principal constraints affecting the programme of immunisation seem to be the cost of the vaccine and the resources of occupational health departments. Costs may be reduced by giving a lower dose of vaccine intradermally. Five districts used the intradermal route (one for all three doses of vaccine and four for the second and third doses); the other departments used standard doses intramuscularly. The intradermal route is effective[3,4] but is the subject of debate,[5] and the product licence for hepatitis B vaccine is for only the intramuscular route. An alternative way in which districts may save money is by asking staff to get their general practitioners to prescribe the vaccine, so that costs are transferred to family practitioner committees' budgets. This, however, introduces an unnecessary hurdle for staff, which is likely to decrease take up. Family practitioner committees' budgets financed (or were planned to finance) 80% or more of the immunisations in five districts and a mean of 18% in a further eight districts. This is a pragmatic solution for districts striving to keep within budgets but is a false economy for the NHS, which loses discounts of about 25% that are available to districts buying in bulk. These problems are unlikely to be resolved unless district health authorities and family practitioner committees are merged and given a common budget.

The financial constraints on the districts are unlikely to absolve them from their legal responsibilities to protect their workforce against hazards at work under the Health and Safety at Work Act (1974) and the Control of Substances Hazardous to Health Regulations, which are soon to be introduced.

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