surgery. The fluctuating deafness characteristic of glue ear makes assessment difficult,[18] but this should not be used as an excuse for omitting objective assessment of hearing disability. Purchasers need to ensure that there are enough resources and staff for this assessment.[4]

In summary, this study shows that social factors are associated with surgical rates and need to be considered when assessing the effectiveness of grommet surgery and tonsillectomy for children.

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1 Venters GA, Bloor MJ. A review of investigations into adenotonsillectomy. *British Journal of Social Medicine* 1974;28:1-9.
2 Bloor MJ, Venters GA. *An epidemiological and sociological study of variations in the incidence of operations on the tonsils and adenoids.* Aberdeen: Institute of Medical Sociology, University of Aberdeen, 1978. (Occasional paper No 2.)
3 Black N. Surgery for glue ear—a modern epidemic. *Lancet* 1984;i:835-7.
4 University of Leeds. *Effective health care. The treatment of persistent glue ear in children.* Leeds: University of Leeds, 1992. (Bulletin No 4.)
5 Currie E, Stillfried D. *Otitis media: a purchaser's guide to cost-effective screening and treatment.* York: Health Economics Consortium, 1992. (Occasional paper No 5.)
6 Carstairs V, Morris R. *Deprivation and health in Scotland.* Aberdeen: Aberdeen University Press, 1991.
7 SPSS Inc. *SPSS-PC+.* Chicago, IL: SPSS, 1990.
8 Gardner MJ, Altman DG. *Statistics with confidence.* London: BMJ, 1989.
9 Bisset AF. Glue ear guidelines. *Lancet* 1993;341:57.
10 Bisset AF. Persistent glue ear in children. *BMJ* 1993;306:454-5.
11 Bisset AF, Russell D. Sex and grommets. *Clin Otolaryngol* 1993;18:430-2.
12 Schilder AGM, Zielhuis GA, Straatman HS, van den Broek P. An epidemiological approach to the etiology of middle ear disease in the Netherlands. *Eur Arch Otorhinolaryngol* 1992;249:370-3.
13 Black N. The "health culture" of families as an influence on the use of surgery for glue ear: a case-control study. *Int J Epidemiol* 1985;14:594-9.
14 Bain DJG, Sales CM. Referring children to an ENT department and prescribing psychotropic drugs to their mothers. *BMJ* 1981;283:585-7.
15 Wennberg J, Gittelsohn A. Variation in medical care among small areas. *Sci Am* 1982;246:100-11.
16 Bloor M. *Bishop Berkeley and the adenotonsillectomy enigma: an exploration of variation in the social construction of medical disposals. Sociology* 1976;10:43-61.
17 Smith IM, Maw AR. Secretory otitis media: a review of management by consultant otolaryngologists. *Clin Otolaryngol* 1991;16:266-70.
18 Glue ear guidelines: time to act on the evidence. *Lancet* 1992;340:1324-5.
19 Otitis media with effusion in children. *Lancet* 1990;336:23-4.
20 De Melker RA. Treating persistent glue ear in children. *BMJ* 1993;306:5-6.
21 Blaxter M, Paterson E. *Mothers and daughters.* London: Heinemann, 1981.
22 Coulter A, McPherson K. Socioeconomic variations in the use of common surgical operations. *BMJ* 1985;291:183-7.
23 Smith GD, Egger M. Socioeconomic differentials in wealth and health. *BMJ* 1993;307:1085-6.

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Childhood eczema: disease of the advantaged?

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Abstract

***Objective*—To determine whether the increased prevalence of childhood eczema in advantaged socioeconomic groups is due to increased parental reporting.**

***Design*—Comparison of parental reports of eczema with visible eczema recorded by medical officers during a detailed physical examination.**

***Setting*—National birth cohort study.**

***Subjects*—8279 children from England, Wales, and Scotland born during 3-9 March 1958 and followed up at the ages of 7, 11, and 16.**

***Main outcome measures*—Prevalence of eczema according to parental report compared with medical officer's examination at the ages of 7, 11, and 16.**

***Results*—Prevalence of both reported and examined eczema increased with rising social class at the ages of 7, 11, and 16 years. The point prevalence of examined eczema at age 7 was 4·8%, 3·6%, 3·6%, 2·4%, 2·2%, and 2·4% in social classes I, II, III nonmanual, III manual, IV, and V respectively (χ^2 value for linear trend 12·6, $P<0·001$). This trend persisted after adjustment for potential confounders such as region and family size and was not present for examined psoriasis or acne.**

***Conclusions*—Eczema is more prevalent among British schoolchildren in social classes I and II than those in lower classes. Exposures associated with social class are probably at least as important as genetic factors in the expression of childhood eczema.**

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Introduction

One of the most striking findings of the analysis of risk factors for childhood eczema in the 1970 British national cohort study was an increased prevalence of reported eczema in advantaged socioeconomic groups.[1 2] Similar trends in prevalence of reported eczema were found with other measures of socioeconomic advantage such as parental education, less overcrowding, and more household possessions.

One important question arising from these results was whether children from higher social classes really had a higher risk of eczema or whether affluent parents were just more likely to report it. Parents from social classes I and II may use the term eczema more freely for children with minor skin conditions,[3 4] and recall of eczema in early life might vary by social class. Affluent parents might be more likely to take their children to a doctor and acquire the label of eczema for borderline conditions such as dry skin more readily than those in less advantaged socioeconomic groups.[5]

We sought to determine whether the social class trend for reported eczema was also present for eczema found by examination by analysing data from the national child development study. Unlike the other two large national cohort studies in Britain[6 7] the child development study substantiated the presence of eczema by medical examination.[8]

Subjects and methods

The national child development study developed from the national perinatal mortality survey,[8] which gathered detailed information on over 98% of babies born in England, Wales, and Scotland during the week of 3-9 March 1958. These babies have been followed up at the ages of 7, 11, 16, 23, and 33 years. Of the 9518 children for whom information was gathered at the ages of 7, 11, and 16, only those with complete responses on the presence or absence of visible eczema at these ages were included in this study (n=8279, 87%).

When the children were aged 7 parents were asked by health visitors using a structured questionnaire whether their child had had eczematous rashes during the first year of life or at any time after the first year. When the children were aged 11 or 16, parents were asked whether they had had eczematous rashes in the past 12 months. We have used the term examined eczema to refer to visible eczematous dermatoses

recorded by experienced school medical officers during a complete physical examination at the ages of 7, 11, and 16. Examination of the skin was part of a more general examination including physical and mental development. No hypothesis on skin disease was being tested by the study. We derived social class using the registrar general's classification according to the father's occupation when the childen were aged 7.[9]

STATISTICAL ANALYSIS

We used the EpiInfo statistical software to analyse results.[10] Adjusted effects were explored by using unconditional logistic regression techniques with the EGRET software package,[11] exploring each potential confounder individually and in combination. Categorical data were analysed with contingency tables, hypothesis testing being based on the χ^2 test for linear trend for social classes I through to V. Results are expressed in terms of prevalence with 95% confidence intervals.

Results

The prevalence of reported eczema was 1·5-2 times higher in social classes I and II than in classes IV and V at each follow up point (table I). The social class trend was strongest when the children were aged 7 and under.

Prevalences for examined eczema showed similar social class gradients to those for reported eczema at all ages in the follow up study (table II), with a roughly twofold difference in prevalence between the two highest and two lowest social classes. Estimates of prevalence of examined eczema for the small number of single parent families were generally similar to those for social class V.

TABLE I—*Reported prevalences (percentages (numbers of subjects)) of eczema according to age group and social class*

Social class	Age (years) 0-7	10-11	15-16	% Who had ever had eczema by 16	95% Confidence interval
I	11·1 (51/461)	4·8 (22/461)	4·1 (19/461)	13·1 (60/458)	10·0 to 16·2
II	9·2 (113/1228)	5·6 (69/1228)	2·6 (32/1228)	12·4 (149/1205)	10·5 to 14·2
III Non-manual	8·8 (75/850)	5·1 (43/850)	3·2 (27/850)	12·5 (105/837)	10·4 to 14·8
III Manual	7·41 (266/3591)	4·0 (143/3591)	3·1 (113/3591)	11·1 (391/3523)	10·1 to 12·1
IV	5·7 (80/1404)	4·3 (60/1404)	2·1 (29/1404)	8·6 (119/1386)	7·2 to 10·2
V	3·9 (18/463)	3·2 (15/463)	3·0 (14/463)	8·8 (40/452)	6·4 to 11·9
No male head of household	5·3 (11/206)	3·4 (7/206)	2·9 (6/206)	8·4 (17/202)	5·0 to 13·1
χ^2 Linear trend* (P value)	25·3 (<0·001)	5·2 (0·02)	1·4 (0·24)	13·6 (<0·001)	

*For social classes I to V.

TABLE II—*Prevalences of eczema (percentages (numbers of subjects)) according to medical officer's examination*

Social class	Age (years) 7	11	16	7, 11, or 16	95% Confidence interval
I	4·8 (22/461)	3·0 (14/461)	3·9 (18/461)	6·7 (31/461)	4·6 to 9·4
II	3·6 (44/1228)	3·5 (43/1228)	3·3 (40/1228)	6·8 (84/1228)	5·5 to 8·4
III Non-manual	3·6 (31/850)	2·6 (22/850)	2·6 (22/850)	5·8 (49/850)	4·3 to 7·6
III Manual	2·4 (86/3591)	2·5 (89/3591)	2·5 (90/3591)	5·3 (189/3591)	4·6 to 6·1
IV	2·2 (31/1404)	2·2 (31/1404)	2·1 (29/1404)	3·7 (52/1404)	2·8 to 4·8
V	2·4 (11/463)	1·7 (8/463)	2·2 (10/463)	5·4 (25/463)	3·5 to 7·9
No male head of household	1·9 (4/206)	1·9 (4/206)	3·4 (7/206)	4·9 (10/206)	2·4 to 8·8
χ^2 Linear trend* (P value)	12·6 (<0·001)	5·6 (0·02)	6·6 (0·01)	10·3 (0·001)	

TABLE III—*Crude and adjusted odds ratios for examined eczema at ages 7, 11, or 16 years according to social class*

Social class	Odds ratio (95% confidence interval) of examined eczema at the ages of 7, 11, or 16	Adjusted odds ratio* (95% confidence interval)
I	1·00 (reference)	1·00 (reference)
II	0·98 (0·64 to 1·51)	1·00 (0·65 to 1·53)
III Non-manual	0·79 (0·49 to 1·26)	0·78 (0·49 to 1·26)
III Manual	0·72 (0·49 to 1·08)	0·74 (0·49 to 1·11)
IV	0·51 (0·32 to 0·81)	0·53 (0·33 to 0·84)
V	0·73 (0·42 to 1·28)	0·82 (0·47 to 1·45)
χ^2 For trend	10·3 (0·001)	7·1 (0·008)

*Adjusted for region and family size.

The point prevalence estimates for examined eczema were roughly half the annual period prevalences of reported eczema at the same age. The proportion of reported cases of eczema validated by a doctor's examination was higher in social classes I and II. When the presence of reported eczema at 11 and 16, or both, was validated against examined eczema at these ages, the proportion of validated cases was 59% (17/29), 51% (42/82), 53% (21/40), 36% (76/213), 42% (31/73), and 38% (10/26) in social classes I, II, III non-manual, III manual, IV, and V respectively (χ^2 for linear trend 4·57). This significant (P=0·03) trend is in the direction opposite to that proposed in the prior hypothesis—that is, that overreporting of eczema occurs in higher social classes. The proportion of children with examined eczema who did not have reported eczema showed no trend with social class.

Table III shows the adjusted risks for examined eczema at the ages of 7, 11, or 16 according to social class. Several potential confounders were explored in the regression analysis, including region of residence, ethnic group, maternal or paternal smoking when the children were aged 16, sex of child, breast feeding, and family size. Only region of residence and family size were significantly associated with both social class and examined eczema. The size of the odds ratio for examined eczema within each social class remained virtually unchanged despite adjusting for these factors. A history of hay fever or asthma was not considered as a potential confounder. Similar social class trends for examined eczema were seen within the unlinked data at each follow up point (data not shown).

We also examined household tenure, another possible indicator of socioeconomic status, with respect to eczema. The prevalence of reported eczema at any age was 12·3% (438/3555), 10·1% (90/892), 10·6% (308/2893), and 6·6% (13/197) in privately owned, privately rented, council rented, and rent free properties respectively (χ^2 value for privately owned versus council rented property 4·2, P=0·04). The prevalence of examined eczema at any age was 6·1% (222/3622), 5·7% (52/907), 4·5% (146/3254), and 2·0% (4/201) in privately owned, privately rented, council rented, and rent free properties respectively (χ^2 value for owned versus council rented property 8·8, P=0·003).

OTHER CONDITIONS

To explore whether medical officers had a general tendency to overestimate visible skin disease in social classes I and II we also examined two other common inflammatory skin diseases recorded in the study—psoriasis and acne—with respect to social class (table IV). Visible psoriasis was recorded only at the ages of 11 and 16 and acne only at the age of 16. Prevalences for these two diseases showed no evidence of a strong social class gradient.

Prevalences of reported hay fever were also higher in social clases I and II, and the difference in prevalence between social classes increased from the age of 7 to 16 (table V). Prevalence of reported asthma or wheezy bronchitis, or both, in the past year did not show such trends.

TABLE IV—*Prevalences of psoriasis and acne (percentages (numbers of subjects)) found by medical officers at examination*

Social class	Psoriasis at age 11 or 16	Acne at age 16
I	1·5 (7/461)	25·2 (116/461)
II	0·9 (11/1228)	23·8 (292/1228)
III Non-manual	0·6 (5/850)	24·8 (211/850)
III Manual	1·1 (41/3591)	21·8 (784/3591)
IV	1·1 (15/1404)	21·7 (305/1404)
V	1·1 (5/463)	23·3 (108/463)
χ^2 Linear trend (P value)	0·02 (0·9)	3·4 (0·06)

TABLE V—*Prevalences (percentages (numbers of subjects)) of parental reports of hay fever and asthma or wheezy bronchitis in past year according to social class for ages 7, 11, and 16 years*

	Reported hay fever			Reported asthma or wheezy bronchitis		
Social class	7	11	16	7	11	16
I	8·2 (38/461)	14·3 (65/454)	18·2 (84/461)	7·7 (35/454)	5·6 (25/445)	2·9 (11/379)
II	5·8 (71/1228)	11·0 (133/1210)	15·3 (188/1228)	6·8 (81/1196)	5·3 (63/1186)	4·2 (45/1080)
III Non-manual	7·6 (65/850)	11·3 (94/832)	16·9 (144/850)	7·9 (65/826)	6·2 (51/825)	3·6 (27/759)
III Manual	5·4 (195/3591)	8·0 (281/3517)	9·7 (348/3591)	8·2 (289/3522)	4·3 (151/3489)	3·1 (97/3102)
IV	4·6 (65/1404)	5·5 (76/1385)	8·4 (118/1404)	9·2 (126/1371)	5·9 (80/1366)	4·1 (51/1231)
V	4·5 (21/463)	4·9 (22/450)	5·6 (26/463)	6·2 (28/453)	3·1 (14/450)	2·3 (9/400)
χ^2 Linear trend* (P value)	9·5 (0·002)	58·1 (<0·001)	88·9 (<0·001)	1·3 (0·3)	1·8 (0·2)	0·3 (0·6)

Discussion

Other studies that have considered the possible relation between social class and eczema have given conflicting results.[12-16] Our results suggest that the increased prevalence of reported eczema in advantaged socioeconomic groups is genuine. It is consistent at each stage of the follow up, regardless of how eczema is defined, and is also seen with housing tenure, another measure of socioeconomic advantage. The trend in social class for examined eczema was virtually unchanged after adjustment for potential confounders, and the proportion of reported cases validated by medical officer's examination increased rather than decreased in higher socioeconomic groups. Similar trends were not observed for psoriasis and acne.

Hay fever, but not asthma or wheezy bronchitis, showed the same social class gradient as eczema. Eczema and hay fever have also been shown to have similar associations with household size[17] and region of residence,[18] whereas asthma or wheezy bronchitis showed a different epidemiological pattern in this cohort.[19] A genuine social class gradient for allergic diseases such as eczema is supported by the findings of a similar socioeconomic gradient for more objective measures of allergic disease such as positive results in skin prick tests.[20-23]

One of the strengths of this study is its low potential for observer bias because medical officers were unaware of the hypotheses, which were suggested many years later, and information on social class was collected independently by an interviewer. A possible limitation is the reliance on medical officers' diagnoses of eczema. At the time the study was carried out eczema was used synonymously with atopic eczema for children in Britain. The prevalence of examined eczema is similar to that in other studies conducted at that time in developed countries,[24 25] and the difference in prevalence between reported and examined eczema is entirely compatible with the twofold difference between the point and one year period prevalences for eczema found in other studies.[26 27] Inclusion of cases of scabies and nickel dermatitis due to earrings would be likely to reduce rather than exaggerate social class trends shown in this study.[28 29]

Reporting bias could still have occurred if articulate upper middle class children were more likely to tell medical officers that they had eczema or if medical officers examined well turned out children more thoroughly. This seems unlikely as children were undressed at the time, and the skin examination was only a small part of a more detailed physical assessment. The lack of a social class trend for acne or psoriasis or for cases of examined eczema not validated by parental report lends weight to this argument. Social class differences of eczema may reflect factors that determine chronicity rather than incidence of disease. If this was the case examined eczema at the age of 7 should show a much stronger social class trend than reported eczema from birth to 7. This was not the case.

EXPLANATION OF THE TREND

There are many possible reasons for the social class trend for examined eczema shown in this study. Correlates of educational status, such as positive health related behaviour—for example, increased uptake of immunisation or differing rates of exposure to topical corticosteroids—could be risk factors for eczema.[2] Other factors such as differences in the use of carpets and heating (which could influence house dust mite populations),[30] overuse of showers or soaps, decreased exposure to ultraviolet light, increased close contact with pets, and prenatal exposures correlated with higher social class such as higher maternal age and maternal diet also need to be considered.[2 31]

Our findings relate to British children in the 1960s and 1970s, and social class differences may have altered since. In developing countries a social class gradient in the opposite direction may be seen for eczema because of increased secondary infections, increased exposure to primary irritants through child labour, and reduced access and provision of medical care in less privileged groups.[32]

Atopic eczema causes much suffering and has a lifetime prevalence of around 12% at the age of 5 in the United Kingdom.[1] The twofold variation in prevalence of eczema between the highest and lowest social classes represents a considerable burden of potentially preventable disease. Since environmental determinants of eczema are largely unknown, exploration of correlates with social class is a useful starting point. At the least, social class should be considered as a potential confounder for comparative studies of eczema prevalence.

Epidemiological implications

- Eczema seems to be more common in children from higher social classes than in those from lower classes, but it is not clear whether this is due to parental overreporting
- In this study eczema based on examinations by school medical officers was twice as common in social classes I and II as in IV and V
- The proportion of cases of parental reported eczema that were validated by examination was higher in higher social classes
- Environmental factors seem to be as important as genetic factors in determining childhood eczema
- Social class should be included as a possible confounder in all studies of the prevalence of eczema

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1 Golding J, Peters TJ. The epidemiology of childhood eczema. 1. A population based study of associations. *Paediatr Perinatal Epidemiol* 1987;1:67-79.
2 Peters TJ, Golding J. The epidemiology of childhood eczema. 2. Statistical analysis to identify independent early predictors. *Paediatr Perinatal Epidemiol* 1987;1:80-94.
3 Wüthrich B. Epidemiology of the allergic diseases: are they really on the increase? *Int Arch Allergy Appl Immunol* 1989;90:3-10.
4 Taylor B, Wadsworth J, Wadsworth M, Peckham C. Changes in the reported prevalence of childhood eczema since the 1938-45 war. *Lancet* 1984;ii:1255-7.
5 Waters WE. Migraine, social class, and familial prevalence. *BMJ* 1971;ii: 77-81.
6 Atkins E, Cherry NM, Douglas JWB, Kiernan KE, Wadsworth MEJ. The 1946 British birth survey: an account of the origins, progress and results of the national survey of health and development. In: Mednick SA, Baert AE, eds. *An empirical basis for primary prevention: prospective longitudinal research in Europe.* Oxford: Oxford University Press, 1981:25-30.
7 Golding J, Peters TJ. Eczema and hay fever. In: Butler NR, Golding J, eds. *From birth to five—a study of the health and behaviour of Britain's 5-year-olds.* Oxford: Pergamon Press, 1986.
8 Shepherd PM. *The national child development study: an introduction to the origins of the study and the methods of data collection.* London: NCDS User Support Group, City University, 1985.
9 Leete R, Fox AJ. Registrar general's social classes: origins and uses. *Population Trends* 1977;9:1-7.
10 Dean AG, Dean JA, Burton AH, Dicker RC. *Epi-Info, Version 5.2.* Atlanta: Centers for Disease Control, 1990.
11 *Epidemiological graphics, estimation and testing package.* Seattle: Statistics and Epidemiology Research Corporation, 1988.
12 Borelli S, Schnyder UW. Neurodermatitis constitutionalis sive atopica. II. In: Miescher G, Storck H, eds. *Entzündliche dermatosen II.* New York: Springer, 1965:254.
13 Bowker NC, Cross KW, Fairburn EA, Wall M. Sociological implications of an epidemiological study of eczema in the City of Birmingham. *Br J Dermatol* 1976;95:137-44.
14 Forster J, Dungs M, Wais U, Urbanek R. Atopie-verdächtige symptome in den ersten zwei Lebensjahren. *Klin Pädiatr* 1990;202:136-40.
15 Burr M, Miskelly FG, Butland BK, Merrett TG, Vaughan-Williams E. Environmental factors and symptoms in infants at high risk of allergy. *J Epidemiol Community Health* 1989;43:125-32.
16 Arshad SW, Hide DW. Effect of environmental factors on the development of allergic disorders in infancy. *J Allergy Clin Immunol* 1992;90:235-41.
17 Strachan DP. Hay fever, hygiene and household size. *BMJ* 1989;299:1259-60.
18 Strachan DP, Golding J, Anderson HR. Regional variations in wheezing illness in British children: the effect of migration during early childhood. *J Epidemiol Community Health* 1990;44:231-6.
19 Anderson HR, Bland JM, Patel S, Peckham C. The natural history of asthma in childhood. *J Epidemiol Community Health* 1986;40:121-9.
20 Gergen PJ, Turkeltaub PC, Kovar MG. The prevalence of allergic skin test reactivity to eight common aeroallergens in the US population: results from the second national health and nutrition examination survey. *J Allergy Clin Immunol* 1987;80:669-79.
21 Barbee RA, Lebowitz MD, Thompson HC, Burrows B. Immediate skin test reactivity in a general population sample. *Ann Intern Med* 1976;84:129-33.
22 Freeman CL, Johnson S. Allergic diseases in adolescents. *Am J Dis Child* 1964;107:549-66.
23 Smith JM. Incidence of atopic disease. *Med Clin North Am* 1974;58:3-24.
24 Larson P-Å, Lidén S. Prevalence of skin disease among adolescents 12-16 years of age. *Acta Derm Venereol* 1980;60:415-23.
25 Freeman GL, Johnson S. Allergic diseases in adolescents. I. Description of survey: prevalence of allergy. *Am J Dis Child* 1964;107:549-59.
26 Johnson MLT, Roberts J. Skin conditions and related need for medical care among persons 1-74 years. *Vital Health Statistics* 1978;11:212.
27 Meding B, Swanbeck G. Prevalence of hand eczema in an industrial city. *Br J Dermatol* 1987;116:627-34.
28 Smit HA, Coenraads PJ. Epidemiology of contact dermatitis. *Monogr Allergy* 1993;31:29-48.
29 Office of Population Censuses and Surveys. *Morbidity statistics from general practice 1971-2. Second national study.* London: Royal College of General Practitioners, OPCS, 1979.
30 Coloff MJ, Ayres J, Carswell F, Howarth PH, Merrett TG, Mitchell GB, *et al.* The control of allergens of dust mites and domestic pets: a position paper. *Clin Exp Allergy* 1992;122:545-51.
31 Arshad SH, Matthews S, Gant C, Hide D. Effect of allergen avoidance on development of allergic disorders in infancy. *Lancet* 1992;339:1493-97.
32 Rajka G. Atopic dermatitis. Correlation of environmental factors with frequency. *Int J Dermatol* 1986;25:301-4.

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Loss of employment and mortality

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Abstract

***Objective*—To assess effect of unemployment and early retirement on mortality in a group of middle aged British men.**

***Design*—Prospective cohort study (British Regional Heart Study). Five years after initial screening, information on employment experience was obtained with a postal questionnaire.**

***Setting*—One general practice in each of 24 towns in Britain.**

***Subjects*—6191 men aged 40-59 who had been continuously employed for at least five years before initial screening in 1978-80: 1779 experienced some unemployment or retired during the five years after screening, and 4412 remained continuously employed.**

***Main outcome measure*—Mortality during 5·5 years after postal questionnaire.**

***Results*—Men who experienced unemployment in the five years after initial screening were twice as likely to die during the following 5·5 years as men who remained continuously employed (relative risk 2·13 (95% confidence interval 1·71 to 2·65). After adjustment for socioeconomic variables (town and social class), health related behaviour (smoking, alcohol consumption, and body weight), and health indicators (recall of doctor diagnoses) that had been assessed at initial screening the relative risk was slightly reduced, to 1·95 (1·57 to 2·43). Even men who retired early for reasons other than illness and who appeared to be relatively advantaged and healthy had a significantly increased risk of mortality compared with men who remained continuously employed (relative risk 1·87 (1·35 to 2·60)). The increased risk of mortality from cancer was similar to that of mortality from cardiovascular disease (adjusted relative risk 2·07 and 2·13 respectively).**

***Conclusions*—In this group of stably employed middle aged men loss of employment was associated with an increased risk of mortality even after adjustment for background variables, suggesting a causal effect. The effect was non-specific, however, with the increased mortality involving both cancer and cardiovascular disease.**

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Introduction

Many studies have shown that unemployed men are less healthy and have a higher mortality than employed men.[1-10] It has been suggested that this might be explained by a health selection effect into unemployment, with less healthy workers being more likely to lose their jobs and finding it harder to regain employment.[11-14] However, because of small sample sizes or a lack of health measures before the loss of employment, the reported studies have been limited in their ability to investigate the extent to which health selection explains the raised mortality in unemployed men.

We used prospective data from a national study of cardiovascular disease to examine mortality in a population of stably employed middle aged men in Britain, some of whom subsequently experienced a loss of employment. Measures of health and health related behaviour made before the loss of employment enabled us to allow for the effect of health selection and to determine the possible effects of loss of employment on apparently healthy men.