SHORT REPORT

Socioeconomic position, occupational exposures, and gender: the relation with locomotor disability in early old age

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The direction and magnitude of sex differences in health vary according to the particular health condition and phase of the life cycle.¹ In examining gender differences in health it is necessary to assess the contribution made by the particular characteristics of women and men, for example, wealth, health behaviours, and the distribution of labour both inside and outside of the home.² Socioeconomic inequalities in disability are likely to result from lifetime exposures to both poor living conditions and adverse occupational exposures. However, it is not clear whether such factors would play similar parts for men and women given the degree of gender segregation in the workplace that persisted throughout the 20th century. Therefore, the aim of this analysis was to assess gender and class inequalities in locomotor disability making allowance for indicators of economic hardship and lifetime occupational exposures. The analysis concentrates on men and women in early old age, a comparatively neglected group in research on gender differences in health.

METHODS

Findings are based on data reported in 1990/91 by 858 respondents born in the early 1930s who are participating in the West of Scotland Twenty-07 study, a longitudinal study of social inequalities in health. Further details of the design and sampling have been described elsewhere.³ Ethical approval was obtained for the study. The main outcome measure was locomotor disability; those reporting positively to any of the 17 items of a questionnaire adapted from the Office of National Statistics surveys of disability⁴ were classified as disabled. These items incorporated, ability to walk, climb stairs, bending and straightening, and number of falls. The measures of socioeconomic position that were used in the analysis included: (1) occupational class—occupation of head of household ranked into five classes from social class (SOC) I (highest) to SOC V (lowest); (2) car ownership—yes/no; (3) housing tenure—owner occupier/other; (4) household income—in pounds per week adjusted for household size and composition; (5) area deprivation assessed using the Carstairs Index, which was derived from 1991 census variables (from 1 (least deprived) to 7 (most deprived)). Respondents were asked to estimate the number of years they had been exposed to 13 conditions relating to the physical and psychological workplace environment during their working lives and included: work in very noisy conditions, work in very dusty conditions, work in very hot conditions, work in very cold conditions, work in very wet conditions, work with fumes or chemicals, work with a lot of vibration, work in a bent or uncomfortable position, work which was monotonous and repetitive, work which was too hectic or fast, work causing a lot of stress and worry, hard tiring physical work, and outdoor work. For this analysis, these data were categorised into none compared with one or more years of exposure.

The relation between locomotor disability and the measures of occupational exposure, socioeconomic position, and gender

were assessed using χ^2 or *t* tests and univariable logistic regression. All variables on occupational exposure were tested for interaction with gender. A series of logistic regressions were then conducted to consider the relations between social class and gender with locomotor disability controlling for other measures of socioeconomic position (including household income) and those occupational exposures significantly associated with locomotor disability (for either men or women) in the univariable analysis. All multivariable analysis was conducted using complete data.

RESULTS

Prevalence of locomotor disability among this cohort (aged about 58 years) was 27.2% (95% CI 22.7 to 31.7). The odds of locomotor disability were increased by all measures of lower socioeconomic position and all measures of more adverse occupational exposures relating to the “physical” environment in univariable analyses (see table 1).

When adjusting for gender, those in manual social classes were more likely to have locomotor disability than those in the non-manual social classes (OR 2.74, 95% CI 1.90 to 3.93 $p<0.001$). This relation was attenuated after adjustment for additional measures of socioeconomic position (OR 1.67, 95% CI 1.12 to 2.50, $p<0.012$). When those occupational exposures found to be associated with locomotor disability in the univariable analysis were then included in the model, the association between social class and locomotor disability was further attenuated and was no longer statistically significant at the 5% level (OR 1.39, 95% CI 0.91 to 2.11, $p=0.128$). This would suggest that most of the observed association between social class and locomotor disability, at early old age, is explained by a combination of degree of affluence and occupational exposures.

Women were about 60% more likely to report locomotor disability compared with men, after adjusting for household social class (OR 1.63, 95% CI 1.17 to 2.27, $p=0.004$). Adjustment for additional measures of socioeconomic position slightly attenuated this association (OR 1.49, 95% CI 1.06 to 2.10, $p=0.023$). However, with further adjustment for cumulative occupational exposures, the association became much stronger, and women were over two times more likely than men to report locomotor disability (OR 2.27, 95% CI 1.47 to 3.49, $p<0.001$).

There was no evidence of any interactions between gender and the occupational exposures with the exception of exposure to dust. This may have led to some residual confounding for this exposure in the logistic regression analysis and may have resulted in a slight over-estimation of the increased risk of locomotor disability among women. However, it is unlikely that any residual confounding relating to exposure to dust would explain all of the observed gender difference. Given the lack of previous research postulating this interaction, this result should be interpreted with caution and may have occurred by chance given multiple significance testing.

Table 1 Univariate associations between socioeconomic position and occupational exposures as risk factors for locomotor disability by gender

Condition	Category	Men				Women			
		n	% disabled	OR	95% CI	n	% disabled	OR	95% CI
SOC	I/II/IIIM	146	13.7	1.00		215	19.5	1.00	
	IIIM/IV/V	253	31.2	2.86	1.66 to 4.92	244	37.7	2.49	1.62 to 3.81
Car ownership	Yes	254	16.5	1.00		284	22.9	1.00	
	No	144	38.9	3.21	2.01 to 5.14	175	39.4	2.19	1.45 to 3.31
Tenure	Own/Occ	223	17.0	1.00		251	18.7	1.00	
	Other	176	34.7	2.58	1.62 to 4.12	207	42.0	3.15	2.07 to 4.79
Area deprivation	1/2/3	116	15.5	1.00		133	19.6	1.00	
	4/5	138	21.7	1.51	0.79 to 2.88	155	30.3	1.79	1.04 to 3.10
	6/7	144	34.7	2.90	1.58 to 5.32	170	35.9	2.30	1.35 to 3.92
Outdoors	0 y	194	21.7	1.00		426	28.2	1.00	
	≥1 y	202	28.2	1.42	0.90 to 2.25	26	34.6	1.35	0.59 to 3.11
Noise	0 y	114	14.9	1.00		262	23.3	1.00	
	≥1 y	284	28.9	2.32	1.30 to 4.12	191	36.1	1.86	1.24 to 2.81
Dust	0 y	158	22.2	1.00		321	23.4	1.00	
	≥1 y	240	26.7	1.28	0.80 to 2.05	131	44.3	2.75	1.78 to 4.24
Heat	0 y	194	18.6	1.00		307	22.2	1.00	
	≥1 y	204	30.9	1.96	1.23 to 3.13	145	42.8	2.63	1.72 to 4.02
Cold	0 y	210	21.0	1.00		374	27.0	1.00	
	≥1 y	188	29.3	1.56	0.99 to 2.46	78	37.2	1.60	0.96 to 2.67
Wet	0 y	235	20.9	1.00		416	27.2	1.00	
	≥1 y	163	30.7	1.68	1.06 to 2.66	35	45.7	2.26	1.12 to 4.54
Fumes	0 y	210	21.4	1.00		387	26.4	1.00	
	≥1 y	188	28.7	1.48	0.94 to 2.33	65	43.1	2.11	1.23 to 3.63
Vibrations	0 y	228	20.6	1.00		363	22.9	1.00	
	≥1 y	170	30.6	1.70	1.07 to 2.68	88	52.3	3.69	2.28 to 6.00
Bending	0 y	213	18.8	1.00		363	25.1	1.00	
	≥1 y	180	32.2	2.05	1.29 to 3.26	89	43.8	2.33	1.44 to 3.77
Arduous	0 y	171	15.8	1.00		301	24.9	1.00	
	≥1 y	227	31.7	2.48	1.51 to 4.07	151	36.4	1.73	1.13 to 2.63
Stressful	0 y	254	24.8	1.00		348	27.0	1.00	
	≥1 y	144	25.0	1.01	0.63 to 1.62	104	34.6	1.43	0.90 to 2.28
Hectic	0 y	265	26.0	1.00		329	26.4	1.00	
	≥1 y	132	22.7	0.84	0.51 to 1.36	123	35.0	1.50	0.96 to 2.33
Boring	0 y	243	23.5	1.00		306	27.1	1.00	
	≥1 y	154	27.3	1.22	0.77 to 1.94	147	32.7	1.30	0.85 to 2.00

COMMENT

The magnitude of gender differences in locomotor disability may be masked by variables relating to socioeconomic position and occupational exposures. Our findings are consistent with other studies in showing that women in early old age are at greater risk of disability than men,^{2,3} but controlling for socioeconomic position and occupational exposures shows that the extent of the association between gender and locomotor disability is underestimated. Our findings suggest that social class inequality in locomotor disability is largely explained by adverse socioeconomic factors and occupational exposures. By contrast, the gender difference in locomotor disability is augmented after adjustment for these variables. Making allowance for the effects of adverse occupational exposure increases the gender difference as these exposures are themselves strongly associated with disability but are much more common among men than women.

While locomotor disability towards the end of their working lives is better explained by occupational exposures among men than women, it is probable that adverse non-occupational factors (for example, obesity) play a part in explaining gender differences in locomotor disability. These gender differences in the explanatory power of occupational exposures may reflect the kinds of jobs available to men and women in the second half of the 20th century.

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REFERENCES

- 1 **Macintyre S**, Hunt K, Sweeting H. Gender differences in health: are things really as simple as they seem? *Soc Sci Med* 1996;**42**:617–24.
- 2 **Arber S**, Cooper H. Gender differences in health in later life: the new paradox? *Soc Sci Med* 1999;**48**:61–76.
- 3 **Ford G**, Ecob R, Hunt K, *et al*. Patterns of class inequality in health through the lifespan: class gradients at 15, 35 and 55 years in the West of Scotland. *Soc Sci Med* 1995;**39**:1050.
- 4 **Martin J**, Meltzer H, Elliot D. *OPCS surveys of disability in Great Britain: Report 1. The prevalence of disability among adults*. London: Her Majesty's Stationery Office, 1988.
- 5 **Lahelma E**, Martikainen P, Rahkonen O, *et al*. Gender differences in ill health in Finland: patterns, magnitude and change. *Soc Sci Med* 1999;**48**:7–19.

THE JECH GALLERY.....

The right water and the right to water

Twenty per cent of the world's population lack access to clean water, 80% of them being rural dwellers. Some 2.3 billion people each year suffer from diseases linked to water, and a child dies every eight seconds from contaminated water. Clean and safe water has been considered an important step towards development. In fact, the single public health intervention that achieved most in the 20th century was an improvement in water and sanitation. In November 2002, the United Nations Committee on Economic, Cultural and Social Rights issued a statement declaring access to water a human right and stating that water is a social and cultural good, not merely an economic commodity. The image, from the Peruvian rainforest, shows a water barrel, and, next to it, smaller containers for cooking, washing, and cleaning. Malaria, diarrhoea, and malnutrition are the area's neighbours.

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