Department of
Public Health,
University of
Liverpool,
Liverpool L69 3GB

Simon Capewell
*professor of clinical
epidemiology*

Correspondence to:
J Chalmers
jim.chalmers@isd.
csa.scot.nhs.uk

practice at the University of Glasgow, is helpful: "More miles on the clock" (G Watt, personal communication, 1999).

The composition of the cohort changed markedly from 1974 to 1997, with a much greater proportion of survivors in 1997 being in the least deprived fifth than in the most deprived (27% and 14%, respectively, of men and 23% and 17% of women).

These effects of deprivation on premature death may not be obvious in tables or histograms.[2] Our cohort survival graphs, which can be constructed without complex links between records, clearly show the relation between deprivation and mortality.

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Mobility impairments and use of preventive services in women with multiple sclerosis: observational study

Eric Cheng, Lawrence Myers, Sheldon Wolf, Deborah Shatin, Xin-Ping Cui, George Ellison, Thomas Belin, Barbara Vickrey

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Department of
Neurology,
University of
California,
650 Charles Young
Drive South,
Box 951736,
Los Angeles,
CA 90095-1769,
USA

Eric Cheng
health services fellow

Lawrence Myers
professor

Sheldon Wolf
physician

George Ellison
professor emeritus

Barbara Vickrey
associate professor
Center for Health
Care Policy and
Evaluation, 9000
Bren Road East,
Minnetonka,
MN 55343, USA

Deborah Shatin
senior researcher
Department of
Biostatistics,
University of
California,
Los Angeles

Xin-Ping Cui
graduate student

Thomas Belin
associate professor
Correspondence to:
E M Cheng
emc@ucla.edu

Use of preventive health services is affected by factors such as patient demographics, clinical characteristics, type of provider, and type of healthcare system.[1] Although people with multiple sclerosis may have impaired mobility, their lifespans are similar to age matched population controls. They therefore need standard preventive services to prevent early mortality. We evaluated the relation between mobility and use of preventive services in women with multiple sclerosis.

Participants, methods, and results

In 1996, we sent questionnaires to 1164 adults with multiple sclerosis who had received outpatient care in 1993 or 1994 from one of three systems of health care (two forms of managed care and fee for service insurance) in two regions of the United States.[2] The overall response rate was 80% (930/1164). We report here survey analyses from the 713 women respondents.

We collected self reported rates of cervical smear testing, mammography, and breast examination (if over age 50), blood pressure checks, cholesterol screening, and physician assessment of health habits. We assessed these rates according to the patient's mobility level (fully ambulatory, ambulatory with help, and not ambulatory) and compared them with Healthy People 2000 recommendations.[3] For each preventive service, we used logistic regression to model the relation between that service, mobility, patient demographics, comorbidity,[2] system of health care, indicators for having a primary care physician and a multiple sclerosis physician, and specialty of these physicians.

The mean age of the women was 47 years; 86% were white and 40% had a four year college degree. Overall rates for cervical smear tests, breast examinations, and mammography exceeded Healthy People 2000 recommendations, but rates were highest for the ambulatory group and lowest for the non-ambulatory group (P≤0.05, table). Cervical smear testing was below Healthy People 2000 goals for the ambulatory with help and non-ambulatory groups. In contrast, rates for general preventive services did not differ by mobility.

In the multivariable models, ambulatory patients had 5.32 times the odds of having a cervical smear test, 3.62 times the odds of having a breast examination, and 3.24 times the odds of having mammography relative to non-ambulatory patients (all P < 0.05). Older age was associated with a lower rate of cervical smear tests; however, no other variables were related to receipt of women's preventive services. Except for an increased odds of assessing eating habits in the non-ambulatory group, mobility status did not affect the odds of receiving general preventive services.

Comment

Use of women's preventive health services was lower in non-ambulatory women than in fully or partially ambulatory women with multiple sclerosis. These results are the same as those in a previous population based US study of women with and without mobility impairments due to various conditions,[4] even though women in our study had a single chronic condition, were younger, were more educated, and all had health insurance and a regular source of care in health systems that met broad national screening goals.

There are several possible explanations for these findings. Doctors may believe that such patients do not have an adequate life expectancy to warrant women's preventive screening. However, such attitudes would be incompatible with the high rates of blood pressure and cholesterol checks. Alternatively, patients may be reluctant to undergo screening services that are potentially uncomfortable or embarrassing.[5] A third possibility is that the medical systems cannot easily accommodate patients with mobility impairments, who may require access to specialised equipment and extra time.

Use of preventive services among women with multiple sclerosis by degree of mobility

	Healthy People 2000 target rates (%)	No (%) reporting use of preventive services (unadjusted)*				P value	Validation (c) statistic for logistic regression	Adjusted odds ratios (95% CI)¶	
		Overall (n=713)	Fully ambulatory† (n=363)	Ambulatory with help‡ (n=239)	Not ambulatory§ (n=111)			Fully ambulatory	Ambulatory with help
Women's preventive health services									
Cervical smear test in past 3 years	85	585/692 (85)	334/361 (93)	181/228 (79)	70/103 (68)	0.001	0.73	5.32 (2.74 to 10.3)‡‡	2.11 (1.15 to 3.85)‡‡
Breast examination in past year**	60	196/245 (80)	83/96 (86)	82/104 (79)	31/45 (69)	0.05	0.67	3.62 (1.39 to 9.42)	1.83 (0.75 to 4.48)
Mammography in past 2 years**	60	211/245 (86)	85/95 (89)	94/105 (90)	32/45 (71)	0.006	0.71	3.24 (1.13 to 9.29)	3.37 (1.17 to 9.65)
General preventive health services									
Blood pressure checked in past year	90††	532/678 (78)	268/351 (76)	179/223 (80)	85/104 (82)	0.37	0.70	0.83 (0.43 to 1.59)	0.78 (0.39 to 1.53)
Cholesterol checked in past 5 years	75	494/626 (79)	258/326 (79)	164/205 (80)	72/95 (76)	0.70	0.72	1.31 (0.69 to 2.49)	1.17 (0.61 to 2.26)
In past year, a doctor asked about:									
Eating habits		207/631 (33)	100/329 (30)	66/206 (32)	41/96 (43)	0.08	0.63	0.44 (0.25 to 0.76)	0.53 (0.30 to 0.93)
Exercise habits		327/639 (51)	172/336 (51)	111/209 (53)	44/94 (47)	0.60	0.61	0.86 (0.51 to 1.47)	1.00 (0.58 to 1.73)
Alcohol or drug use		148/616 (24)	84/326 (26)	44/197 (22)	20/93 (22)	0.56	0.60	1.04 (0.56 to 1.91)	1.03 (0.54 to 1.94)

*Response rates exclude women who answered "not sure." When women who responded not sure were combined with those who responded no, the results were similar.
†Can walk at least 1 block or 90 m without ambulation aid.
‡Can walk at least 4.5 m with the aid of a cane, crutch, brace, or walker.
§Unable to walk 4.5 m with the aid of a cane, crutch, brace, or walker.
¶Compared with not ambulatory group. Covariates include mobility, age, race, education, comorbidity, system of health care, indicators for having a primary care physician and multiple sclerosis physician, and specialty of these physicians. Interaction terms of mobility and health system, and mobility and education were included in models but were not significant.
**For respondents aged ≥50 years.
††Healthy People 2000 goal is for 90% of adults to have had blood pressure checked in past 2 years.
‡‡The fully ambulatory group also had significantly higher odds of smear testing relative to the "ambulatory with help" group.

Women with impaired mobility should be considered a vulnerable population for receipt of breast examinations, mammography, and cervical smear tests. Studies are needed to identify factors causing this and to evaluate interventions to reduce the variation across mobility levels.

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