Factors Associated with Nursing Home Admission after Stroke in Older Women

Christina L. Bell, MD, PhD,* Andrea Z. LaCroix, PhD,† Manisha Desai, PhD,‡ Haley Hedlin, PhD,‡ Stephen R. Rapp, PhD,§ Crystal Cene, MD,‖ Jyoti Savla, PhD,¶ Tetyana Shippee, PhD,# Sylvia Wassertheil-Smoller, PhD,** Marcia L. Stefanick, PhD,†† and Kamal Masaki, MD*

Background: We examined the social and economic factors associated with nursing home (NH) admission in older women, overall and poststroke. *Methods:* The Women's Health Initiative (WHI) included women aged 50-79 years at enrollment (1993-1998). In the WHI Extension Study (2005-2010), participants annually reported any NH admission in the preceding year. Separate multivariate logistic regression models analyzed social and economic factors associated with long-term NH admission, defined as an admission on 2 or more questionnaires, overall and poststroke. *Results:* Of 103,237 participants, 8904 (8.6%) reported NH admission (2005-2010); 534 of 2225 (24.0%) women with incident stroke reported poststroke NH admission. Decreased likelihoods of NH admission overall were demonstrated for Asian, Black, and Hispanic women (versus whites, adjusted odds ratio [aOR] = .35-.44, $P < .001$) and women with higher income (aOR = .75, 95% confidence interval [CI] = .63-.90), whereas increased likelihoods of NH admission overall were seen for women with lower social support (aOR = 1.34, 95% CI = 1.16-1.54) and with incident stroke (aOR = 2.59, 95% CI = 2.15-3.12). Increased odds of NH admission after stroke were demonstrated for women with moderate disability after stroke (aOR = 2.76, 95% CI = 1.73-4.42). Further adjustment for stroke severity eliminated the association found for race/ethnicity, income, and social support. *Conclusions:* The level of care needed after a disabling stroke may overwhelm social and economic structures in place that might otherwise enable avoidance of NH admission.

From the *Department of Geriatric Medicine, University of Hawaii John A. Burns School of Medicine, Honolulu, Hawaii; †Women's Health Center of Excellence, Department of Family and Preventive Medicine, University of California, San Diego, California; ‡Quantitative Sciences Unit, Department of Medicine, Stanford University, Stanford, California; §Department of Psychiatry and Behavioral Medicine, Wake Forest University School of Medicine, Winston-Salem, North Carolina; ‖Division of General Internal Medicine and Clinical Epidemiology, University of North Carolina School of Medicine, Chapel Hill, North Carolina; ¶Center for Gerontology and Department of Human Development, Virginia Tech, Blacksburg, Virginia; #Division of Health Policy and Management, School of Public Health, University of Minnesota, Minneapolis, Minnesota; **Department of Epidemiology and Social Medicine, Albert Einstein College of Medicine, Bronx, New York; and ††Department of Medicine, Stanford Prevention Research Center, Stanford University School of Medicine, Palo Alto, California.

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Address correspondence to Christina L. Bell, MD, PhD and Kamal Masaki, MD, Department of Geriatric Medicine, University of Hawaii John A. Burns School of Medicine, 347 N. Kuakini St. HPM 9, Honolulu, HI 96817. E-mail: bellcl@hawaii.edu; km1@hawaii.rr.com.

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We need to identify ways to provide care consistent with patients' preferences, even after a disabling stroke. **Key Words:** Disability—institutionalization—race—ethnicity—social support—long-term care.

Stroke is a known risk factor for nursing home (NH) admission.[1,2] After stroke, the abrupt onset of disabilities in activities of daily living (particularly bathing and toileting) often leads to NH placement, as patients and families are no longer able to meet care needs at home or in independent living settings. After stroke, women are more likely to have functional disability than men,[3,4] have more NH admissions for stroke disabilities than men,[5] and are less likely than men to be discharged home.[6-10] The loss of independence that accompanies stroke may cause significant distress to patients faced with adjusting to a new set of disabilities in an NH while being isolated from their family and friends.

In nonstroke populations, socioeconomic resources and availability of social support may reduce older adults' odds of NH admission. Being married, living with children or others, and owning a house have been associated with a 10%-50% decreased likelihood of NH admission among older adults in general populations, not selected specifically for stroke.[11] Race/ethnicity has also been reported as a factor associated with NH admission. White race was associated with increased likelihood of NH admission in a recent Health and Retirement Study,[12] a systematic review,[13] and a meta-analysis,[2] although a recent study reported increasing NH admissions among nonwhite elders.[14]

In studies of stroke populations, data on race, ethnicity, income, and social support factors relative to poststroke NH admission are limited. Having more social networks was associated with decreased odds of institutionalization poststroke in a small (n = 62) subsample from the EP ESE study.[15] Living alone was associated with increased odds of NH admission after stroke in the Northern Manhattan Stroke Study.[16] To our knowledge, no studies have compared factors such as race, ethnicity, income and educational attainment, and social support resources that are structural (eg, living arrangement, marital status) and functional (eg, availability of someone to provide help or emotional support) associated with NH admission between nonstroke and stroke samples.

Although many patients and families may prefer to avoid NH placement, poststroke care for disabilities may overwhelm families' best intentions, causing guilt, frustration, and even depression during the critical transition period when patients are admitted to NHs. It is unclear whether socioeconomic factors and social support resources that reduce the likelihood of NH admission among older adults are also protective in the setting of an incident stroke, particularly among older women. A greater understanding of factors that are associated with NH admission among women after stroke may guide future interventions to maximize independence and quality of life.

The Women's Health Initiative (WHI) provides a unique opportunity to examine factors associated with NH admission in older women and to study the role of stroke and stroke severity. This multicenter longitudinal prospective study collected NH admission data on a large number of racially, ethnically, and geographically diverse older women, a significant number of whom experienced incident strokes.

Analytical Framework

Factors previously associated with NH admission are shown in Figure 1 and are organized within the Behavioral Model for Vulnerable Populations.[12,13,17-19] This model conceptualizes health care utilization of vulnerable populations as affected by 3 types of factors: predisposing factors for health care utilization, enabling factors that allow individuals to use and choose health care, and need factors that drive health care utilization. For this analysis, we identified predisposing factors for NH admission (age, race/ethnicity, functional dependence, obesity, and comorbidities), enabling factors that may help an individual avoid NH admission by providing alternatives such as home care or community-based care (socioeconomic factors and social support resources) and need factors that result in a need for NH care (in particular, stroke and stroke-related factors). We were especially interested in determining whether the enabling factors were associated with decreased NH admission after stroke, after adjusting for stroke severity. We hypothesized that enabling socioeconomic and social support resource factors would be associated with decreased NH admission in older women and would remain protective after stroke in older women.

Design and Methods

The WHI study began in 1993 as a national, longitudinal study to examine cardiovascular, cancer, and other disease outcomes in postmenopausal women. Previous articles have described the study design, population, and methods.[20-23] The study consisted of several