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LESS IS MORE

Statin Use in Very Elderly Individuals, 1999-2012

There is little randomized evidence to guide the use of statins (HMG-CoA reductase inhibitors) in very elderly individuals (>79 years).^{1,2} Despite this, the very elderly have the highest rate of statin use in the United States.³ Given that few studies have investigated the use of statins among this population in a longitudinal manner by vascular disease, we set out to do so.

Methods | The 1999-2012 Medical Expenditure Panel Survey (MEPS) was used for the analysis.⁴ The MEPS is nationally representative of the civilian noninstitutionalized population of the United States for each year and is sponsored by the Agency of Healthcare Research and Quality and the Centers for Disease Control and Prevention. The survey consists of 5 interviews over 2 years and contains self-reported demographics, medical conditions, and prescription drug information. The analysis included all individuals older than 79 years without liver disease. Prescription drug information was verified by pharmacy data and has been shown to be valid and not bi-

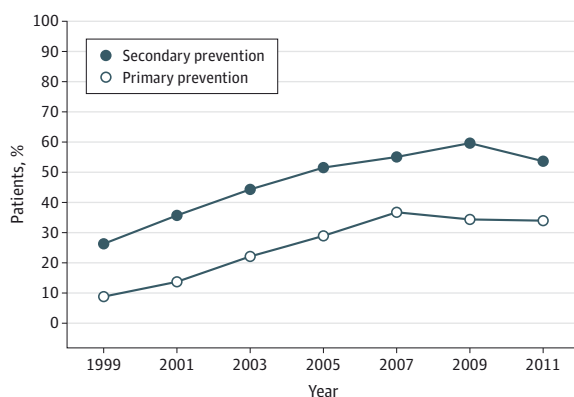
ased by sociodemographic variables.⁵ Statins were identified, and use was classified as the report of any statin prescription. Atorvastatin or rosuvastatin were considered high-potency statins. Primary prevention was defined as individuals without vascular disease (coronary heart disease [CHD], stroke, or peripheral vascular disease). Secondary prevention was defined as vascular disease, which increased in 2007 after questions regarding CHD and/or stroke were asked at every interview instead of once a year.

Logistic regression was used to investigate trends in medication use, while multivariable logistic regression was used to determine if high-potency statin use was associated with vascular disease controlling for year. A sensitivity analysis was conducted that included individuals with diabetes mellitus in the secondary prevention group. Complex survey weighting was included in all analyses, using STATA statistical software (version 13; STATA Corp). The Ohio State University institutional review board ruled this study exempt from review.

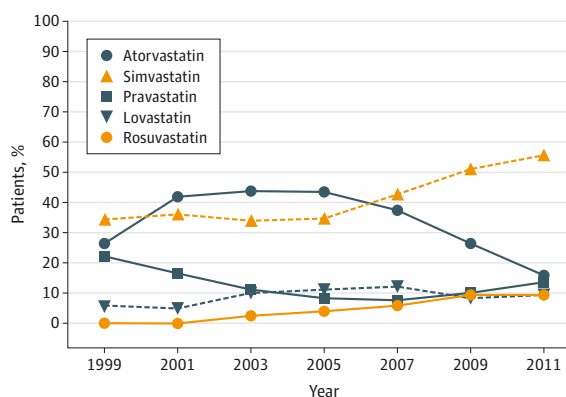
Results | The sample included 13 099 individuals from 1999 to 2012. The rates of vascular disease in the population increased from 27.6% (95% CI, 24.8%-30.5%) in 1999 to 43.7% (95% CI, 41.2%-46.1%) in 2011 to 2012. Among the primary prevention population, the rate of statin use increased from 8.8% (95% CI, 6.3%-12.2%) in 1999 to 34.1% (95% CI, 30.4%-38.1%) in 2011 to 2012 ($P < .001$). There was an increasing trend in statin use in both primary and secondary prevention ($P < .001$ for both comparisons) (Figure, A). High-potency statin use was not associated with vascular disease (odds ratio, 1.01 [95% CI, 0.83-1.22]). The proportion of statin users who used atorvastatin peaked in 2005 to 2006 and then steadily declined, while the proportion that were simvastatin users were steady until 2007 to 2008 when it started to rise. The percentage of statin users who used rosuvastatin steadily increased after its introduction (Figure, B).

Figure. Statin Use in Very Elderly Individuals, 1999-2012

A Statin Use in the Very Elderly by Vascular Disease, 1999-2012



B Statin Use by Drug in the Very Elderly, 1999-2012



Years are grouped into 2-year intervals (eg, 1999-2000). A, Percentages of very elderly individuals (>79 years) who reported a prescription for a statin from 1999 to 2012, by vascular disease. Primary prevention is defined as no history of previous coronary heart disease, stroke, or peripheral vascular disease. Secondary Prevention is defined as a history of coronary heart disease, stroke,

or peripheral vascular disease. B, Percentage of very elderly individuals (>79 years) who reported a prescription for a statin reported by specific statin type (atorvastatin, lovastatin, pravastatin, rosuvastatin, and simvastatin) from 1999 to 2012. Individuals could be counted multiple times if they reported use of different drugs.

The sensitivity analysis that included individuals with diabetes mellitus as secondary prevention did not alter the patterns seen in Figure, A), but there was a decrease in primary prevention use to 30.3% (95% CI, 26.4%-34.4%) in 2011 to 2012.

Discussion | One-third of community-dwelling very elderly individuals without vascular disease reported a statin prescription despite a lack of randomized clinical trials to support their use.^{1,2} Despite a lack of clear recommendation for statin use in the primary prevention of the very elderly within the Adult Treatment Panel III guideline,⁶ there was a large increase in use that coincided with its release. The primary limitation of our study is the change in the classification of vascular disease, which likely increased the sensitivity and decreased the specificity of vascular disease. Hence, the classification of primary prevention likely became more conservative. Although the medical community has embraced the use of statins for primary prevention in the very elderly, caution should be exercised given the potential dangers of expanding marginally effective treatments to untested populations.

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Rates of Kidney Transplantation From Living and Deceased Donors for Blacks and Whites in the United States, 1998 to 2011

Kidney transplantation, the treatment standard for patients with end-stage renal disease (ESRD), is associated with prolonged survival, improved quality of life, reduced morbidity, and lower health care costs compared with dialysis.¹ Racial disparities in kidney transplantation are well documented; studies show that black patients are less likely than white patients to be referred for transplant evaluation, registered for transplantation, progress through the waiting list, and ultimately receive a transplant.² The effects of ongoing efforts to eliminate these disparities are uncertain.³ We used data from the United Network of Organ Sharing (UNOS) registry to examine current patterns of racial disparities in kidney transplantation. To focus on the decision to refer patients for transplantation, we used patients with ESRD as the denominator, not patients on the transplant waiting list.

Methods | To identify transplant recipients and living donors, we queried the UNOS data registry (1998 to 2011). We obtained data on the incidence of ESRD, stratified by race, from the United States Renal Data System and calculated temporal trends in kidney transplantation (per 1000 patients with ESRD) for all transplant recipients and separately for those with deceased and living donors. We adjusted the trends for age, sex, ESRD cause, and geographic region using the direct-iterative adjustment method⁴ and reported the adjusted trends using the estimated annual percent change methodology.

Results | Between 1998 and 2011, 184 303 patients, 13.5% of the 1 355 671 patients with ESRD in the United States Renal Data System, underwent kidney transplantation. Of these patients, 37.1% (n = 68 381) underwent living donor transplantation. **Figure 1** shows that the incidence of kidney transplantation in black patients increased at an annual rate of 2.84% from 93 per 1000 patients with ESRD in 1998 to 128 per 1000 in 2011 (95% CI, +2.32% to +3.41%; *P* < .001). Thus, by 2010, the incidence of kidney transplantation for black and white patients was equivalent.

In whites, the rate of transplantation from deceased donors declined between 1998 and 2011 (estimated annual percent change, -1.66%; 95% CI, -2.11% to -1.20%; *P* < .001), while the rate of transplantation from living donors was unchanged (estimated annual percent change -1.05%; 95% CI, -2.33% to +0.24%; *P* = .14) (**Figure 2A**). For black patients, the rate of kidney transplantation from deceased donors increased (estimated annual percent change, +3.49%; 95% CI, +2.81% to +4.29%; *P* < .001), while the rate of transplantation from living donors was unchanged (estimated annual percent change, +0.14%; 95% CI, -1.73% to +2.01%; *P* = .88) (**Figure 2B**). Over the study period, the percentages of kidney transplants from living donors were 43.2% for white patients and 22.2% for black patients. Of live kidney donations, 15.5% were from black donors; the rate remained stable (estimated annual percent change, -0.78%; 95% CI, -2.53% to +1.21%; *P* = .45).