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Original Article

Selective prescribing of statins and the risk of mortality, hospitalizations, and falls in aged care services

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BACKGROUND: Compared to randomized controlled trials, nonexperimental studies often report larger survival benefits but higher rates of adverse events for statin use vs nonuse.

OBJECTIVE: We compared characteristics of statin users and nonusers living in aged care services and evaluated the relationships between statin use and all-cause mortality, all-cause and fall-related hospitalizations, and number of falls during a 12-month follow-up.

METHODS: A prospective cohort study of 383 residents aged ≥65 years was conducted in six Australian aged care services. Data were obtained from electronic medical records and medication charts and through a series of validated assessments.

RESULTS: The greatest differences between statin users and nonusers were observed in activities of daily living, frailty, and medication use (absolute standardized difference >0.40), with users being less dependent and less frail but using a higher number of medications. Statin use was associated with a decreased risk of all-cause mortality (adjusted hazard ratio [HR] 0.58, 95% confidence interval [CI] 0.37–0.93) and hospitalizations (HR 0.67, 95% CI 0.46–0.98). After exclusion of residents unable to sit or stand, statin use was associated with a nonsignificant increase in the risk of fall-related hospitalizations (HR 1.47, 95% CI 0.80–2.68) but with a lower incidence of falls (incidence rate ratio 0.67, 95% CI 0.47–0.96).

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CONCLUSIONS: The observed associations between statin use and the outcomes may be largely explained by selective prescribing and deprescribing of statins and variation in likelihood of hospitalization based on consideration of each resident's clinical and frailty status. Randomized deprescribing trials are needed to guide statin prescribing in this setting.

Introduction

The prevalence of statin use is high but variable in the long-term care setting, with the prevalence estimates ranging between ~10% and 40%.[1–3] Overall, evidence of benefits and risks of statins for people aged 80 years and older is limited.[4] Randomized controlled trials (RCT) of statins have enrolled relatively small numbers of people aged 75 years and older,[5,6] none aged 85 years and older, and few who are frail or with multimorbidity.[7,8] Nonexperimental studies have attempted to fill the evidence gap. However, results of these studies are inconsistent, with estimated survival benefits ranging from ~80% mortality reduction[9] to virtually no benefit.[10–12]

In long-term care, the high prevalence of use and limited evidence for efficacy in older people has led to statins being targeted for deprescribing.[13] This is particularly true among residents who are frail and those with advanced dementia, who are at increased risk of adverse drug events, often experience swallowing difficulties, and may be treated using a palliative approach. For these reasons, the clinical characteristics of residents living in aged care services who use statins may differ to nonusers and to statin users in community settings. For example, recent hospitalization and polypharmacy have been found to predict statin discontinuation in residents with dementia in long-term care.[14]

In nonexperimental studies of the association between statin use and health outcomes among frail older people, the measured exposure reflects a complex decision process regarding when to prescribe, not prescribe, or deprescribe preventive medications rather than the pharmacological effect of the medication.[15,16] We hypothesized that among residents in aged care, absence of statin use could be a marker for frailty that in turn is a known risk factor for falls, hospitalizations, and mortality.[17–19] In the present study, we sought to compare the clinical and frailty characteristics of users and nonusers of statins residing in aged care services and to evaluate the relationship between statin use and all-cause mortality, all-cause and fall-related hospitalizations, and number of falls. We further evaluated whether the associations between statin use and outcomes would change when considering differences in measured characteristics of the residents.

Materials and methods

Study design and setting

Data were derived from a cohort study of permanent residents of six metropolitan and regional aged care services in South Australia.[20] In Australia, aged care services, synonymous to nursing homes or long-term care facilities, typically provide support and service to older people who are not able to continue living independently.[21] Study participants were recruited in 2014. At the time of the study, residents requiring 24-hour nursing were deemed to require high-level care.

Participants

All residents aged 65 years and older who were able to participate in a structured assessment in English were eligible for inclusion, except for residents with estimated life expectancy <3 months and those considered medically unstable. Of the 664 eligible residents, 603 were invited to participate. Of these, 220 were excluded (34 were unwell, hospitalized, or receiving palliative care; for 54, a third party could not be contacted or did not provide consent; 106 declined and 26 were excluded for other reasons). The final sample included 383 residents. No difference in terms of age, sex, and dementia diagnoses was observed at baseline for the participants compared to all residents of the six aged care services.[22]

Ethics approval was obtained from the Royal Australian College of General Practitioners and the Monash University Human Research Ethics Committees. In case residents were unable to provide informed consent, consent was obtained from guardian, next of kin, or significant other.

Data collection

Demographic, diagnostic, and medication data were sourced from each resident's electronic medical record and medication chart. Three trained study nurses undertook a series of validated assessments, and results were recorded using a standard data extraction form. Observational scales were completed by the study nurse or a staff informant with at least two weeks familiarity with the specified resident. Activities of daily living (ADL) were assessed using the 6-item Katz ADL scale,[23] pain at rest using the Pain Assessment in Advanced Dementia Scale,[24] and the severity of each resident's dementia using the 12-item Dementia Severity Rating Scale (DSRS).[25]

Medication use was extracted directly from each resident's medication administration chart. All medications including regular and as-needed prescription, nonprescription, complementary, and alternative medications were considered. Regular use was identified as a documented regular sequence of administration in the chart.