QUANTITATIVE RESEARCH

Use of aspirin and statins for cardiovascular risk reduction in New Zealand: The residential care story

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ABSTRACT

INTRODUCTION: Cardiovascular disease (CVD) is one of the leading causes of morbidity and mortality for older New Zealanders. Medication prescribing for secondary prevention of cardiovascular events in residential care is unknown and prescribing patterns for aspirin and statins by general practitioners (GPs) in residential care facilities in Auckland, New Zealand are reported here.

METHODS: A representative sample of residential care facilities, all residents over age 65 years and their GPs in one district health board region in Auckland were recruited. Prescribing and medical records were audited by a trained nurse and medications coded into classes according to a standardised process. Diagnoses from summary sheets and hospital letters were recorded. Descriptive statistics were used to show variability in proportion of residents prescribed aspirin and statins.

RESULTS: Of a total of 24 facilities approached, 14 consented to participate (58%); 537 residents (88% of eligible) agreed to participate and 533 completed the study. Residents took on average 8.3 (standard deviation 2.4) medications. On average 2.64 (range 1–6) GPs serviced each facility with eight GPs working in more than one facility. On average 54% of residents with documented CVD were prescribed aspirin and 31% of those with CVD and/or dyslipidaemia were prescribed statins. Variability between prescribers and facilities was high.

DISCUSSION: Prescribing in residential care does not appear to be guidelines-based. The reasons for this are unknown. Ongoing social debate about the role of prevention for older people and interventions for GPs and residential care facilities may impact prescribing rates.

KEYWORDS: Cardiovascular diseases; residential care; aspirin; statins; prescribing patterns; general practitioners

Introduction

In New Zealand (NZ), cardiovascular disease (CVD), including cerebrovascular, ischaemic and peripheral vascular disease, is by far the most prominent cause of morbidity and mortality in the older population.¹ Following global trends, the NZ population is steadily ageing. As a result, there is an increase in the number of older adults with a corresponding increase in the proportion of the population who suffer from cardiovascular disease. This ageing phenomenon has the potential to impose the substantial burden of CVD on the health system as well as the population as a whole. A small proportion of adults over 65 years reside in residential care facilities; however 25% of those over age 85 years are in residential care and it is likely almost all residents have high cardiovascular risk profiles. Chronic illness, such as heart disease and stroke,¹ together with frailty and the loss of physiologic organ reserve,^{2,3} become the dominant determinants of ill-health in the elderly. It is well established that secondary prevention of cardiovascular disease can prevent further cardiovascular events.⁴ Consequently, increased attention will be required for residential care as this is one sector of health care in which almost all residents are at high cardiovascular risk.

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Professor, Department of General Practice and Primary Health Care, Faculty of Medical and Health Sciences, The University of Auckland, PB 92019, Auckland, New Zealand n.kerse@auckland.ac.nz The prescribing of medication is one of the most common interventions for older people in residential care. Medication is a commonly used strategy for risk reduction of CVD in the younger population, but little is known about use in the older adult, particularly those in residential care.

Aspirin and statins are the two most commonly prescribed medications for secondary prevention of CVD. While the benefits of primary prevention with aspirin remain controversial, its effect in reducing cardiovascular events by up to one third in secondary prevention is relatively well established.⁵

Although aspirin causes cerebral and other types of haemorrhage, when used for secondary prevention, the benefit from aspirin therapy far outweighs the harm from major haemorrhage.^{5,6} Aspirin is protective in most patient cohorts who are at increased risk of occlusive vascular events, including those with an acute myocardial infarction or ischaemic stroke, unstable or stable angina, previous myocardial infarction, stroke or cerebral ischaemia, peripheral arterial disease, or atrial fibrillation. For older people, aspirin therapy reduces the combined outcome of any serious vascular event by about one quarter; non-fatal myocardial infarction (MI) by one third, non-fatal stroke by one quarter, and vascular mortality by one-sixth and is particularly worthwhile when CVD risk is greater than 5%.4-8 The New Zealand guideline for management of cardiovascular disease recommends on-going low-dose aspirin as a secondary preventative measure with no stated age limit.⁴

Compared to aspirin, the use of statins is more controversial as a primary prevention measure. There is good evidence that in the older adult secondary prevention with statins reduces the mortality associated with cardiovascular disease by 30%, non-fatal MI by 26% and stroke by 25% over a five-year period.⁹

Despite the benefits of pharmacotherapy, preventive therapy for older people has recently been questioned.¹⁰ The current level of management of cardiovascular risk for frail older people in residential care is unknown in NZ. Although there are few pharmaco-epidemiology studies, it is likely that this is an area where improvement can be made.

WHAT GAP THIS FILLS

What we already know: Management of cardiovascular disease (CVD) is a key responsibility of primary care, as is primary care services to residential aged care. Older people in residential care are at the highest risk of CVD morbidity and could benefit from intervention the most.

What this study adds: There is a large amount of variability in the prescribing of aspirin and statins to older people in residential care. Why different GPs and different facilities should have different rates of preventive care is not known.

The aim of this paper is to report the prescribing patterns for aspirin and statins by general practitioners (GPs) in randomly-selected residential care facilities in Auckland, NZ.

Methods

Subjects

The Auckland District Health Board (ADHB) provided the research team with a list of all the residential care facilities within its catchment area. Using computer-generated random numbers the research team randomly selected residential care facilities to approach. Each facility was then approached by a senior gerontology nurse (KP) and the study explained in full to management. Written informed consent was obtained from each of the residential care facilities' management. Recruitment of the sites commenced in November 2007 and was completed by the end of March 2008.

All eligible residents within consenting residential care facilities were invited to participate in this study. The exclusion criteria included residents under 65 years of age, absent from the facility at the time of recruitment, being terminally ill or too ill to be involved, or lacking family members or guardians who could be contacted. Written informed consent was sought from each eligible resident or from their family member or guardian if the resident was unable to give informed consent due to cognitive impairment. The nursing and health care assistant staff were invited to participate following site consent from management. The study was explained to appropriate staff members and they were included after written informed consent was obtained by direct contact.

GPs delivering medical services in participating homes were asked to participate in the study by mailed invitation and follow-up call by one of the authors (NK). Informed consent was obtained by mailed consent form. The number of homes recruited was limited by the available funding and research staff.

Data collection

Trained registered nurses completed a medical record review using standardised data collection instruments. Current and previous medical conditions as listed in the summary sheets, referral letters and hospital communications, demographic details including age, gender and date of admission were recorded. Prescribed medications of residents were collected from medication charts including information about dosage and duration. The prescribing GP for each resident was recorded. Interview with the clinical nurse manager ascertained structural characteristics of the residential care facilities including size, ownership type, facility type and staffing levels.

Medication coding

To enable a comparative analysis between the different medications and their dosing regimens, the medications were coded using the World Health Organization Anatomical Therapeutic Classification¹¹ (WHO ATC) coding system by JBH. This system unifies different brands and formulations of medications with the same active ingredients into a single code. Any topical medications, eye ointments and dietary supplements were excluded from the coding. The World Health Organization Defined Daily Dosage¹¹ (WHO DDD) system was chosen to allow comparisons between different medications, dosage and dosing intervals. Any information that had been recorded from the medication charts which was deemed insufficient or difficult to interpret, for example medications which were misspelled, were adjudicated by two researchers coding the data (NK, JBH).

Medical conditions taken from the medical records were classified into 15 different categories: dementia; psychosis; anxiety/depression; sleep disorder; heart disease; stroke/transient ischaemic attack (TIA); cardiac arrhythmias; falls/ injury; vision problems; renal failure; arthritis; hypertension; diabetes mellitus; dyslipidemia; and Parkinson's disease.

Participants were classified as having CVD if they were noted to have a diagnosis of heart disease and stroke categories, excluding cardiac arrhythmias, e.g. atrial fibrillation. The following disorders were classified into the heart disease category: angina; ischaemic heart disease; myocardial infarction; heart failure; any cardiac valve disorders; myocarditis; aortic stenosis and mitral regurgitation. Cerebrovascular disease was classified into the stroke/TIA category.

Statistical analysis

Medical condition classification ascertained the prevalence of CVD among the residents. For the purposes of analysis, the sample of residents was categorised into those with existing cardiovascular and cerebrovascular disease and those without. Those on warfarin were excluded from the aspirin analysis. Prevalence of aspirin and statin use in these residents with cardiovascular and cerebrovascular disease was determined by applying the WHO ATC and WHO DDD drug coding systems. Residents with dyslipidemia were also included in the cardiovascular and cerebrovascular group for the analysis of statin use. Descriptive statistics were used to describe the proportion of residents prescribed aspirin and statins using the GP prescriber and then the residential care facility as the denominator. Descriptive statistics were also used to describe the characteristics of both residents and GPs.

Ethical approval for this study was granted by the Northern X Regional Ethics Committee.

Results

Recruitment of residential care facilities

The ADHB provided the research team with a list of 40 rest homes, private hospitals and dementia units within its catchment area. Out of this list, the research team randomly selected 24 residential care facilities, obtaining a range of sizes and types of facility. Fourteen residential care facilities out of 24 (58.3%) consented to take part in the study.

Recruitment of residents

From all participating residential care facilities, a total of 724 residents were invited to take part in the study. From these 724 residents, 81 did not meet the eligibility criteria, thus were not invited. Of the 643 eligible residents, 16 declined to give consent and a further 25 family members and guardians (proxies) refused to give consent on the residents' behalf. Furthermore, 10 residents had died before consent had been given, 19 proxies could not be contacted and 36 family members or guardians who had been given a written consent form never returned them. Thus, 270 residents and 267 proxies gave consent to participating in the study; a total of 537 residents were enrolled (87.5% of eligible, 74.4% of all residents). Before the data collection was complete, three residents died and one had left the facility. A total of 533 residents from the participating residential care facilities were included in the final analysis.

Recruitment of GPs

All 27 GPs invited took part in the study. There were 19 GPs who worked in a single residential care facility, six GPs working in two residential care facilities and two GPs working in three residential care facilities. There were an average of 2.64 GPs servicing each residential care facility.

Medication data

A total of 4415 medications were recorded from the residents' medication charts, a mean of 8.3 standard deviation (SD) 2.4 medications per resident. Four residents took no medication, 254 residents (47.7%) were prescribed aspirin and 123 residents (23%) were prescribed statins.

Medical data

A total of 3369 medical conditions were recorded from the residents' medical notes and are summarised in Table 1. Of the 533 residents, 308 (57.8%) had cardiovascular or cerebrovascular disease and an additional 16 residents had dyslipidemia.

Patterns of aspirin prescribing

Of the 308 residents with CVD, 165 were prescribed aspirin (53.6% prevalence rate). However, Table 1. Prevalence of cardiovascular, cerebrovascular disease and dyslipidaemia in 533 residential care patients.

Residents	Cardiovascular or cerebrovascular disease	Dyslipidemia	Number of GPs
6	1	0	1
31	21	0	6
70	33	4	3
52	41	0	5
19	7	0	1
41	27	1	7
22	7	0	1
7	4	0	1
12	5	1	1
14	5	1	1
27	14	1	3
121	79	5	4
56	34	2	2
55	30	1	1
533	308	16	37
	Residents 6 31 70 52 19 41 22 7 12 14 27 12 14 56 55 533	ResidentsCardiovascular of excessional disease61312170335241707341277171727714172141251145127145634533308	ResidentsCardiovascular of cerebrovascular diseaseDyslipidemia6103121031210703345241019704127122707407401251145127141121795563425530816

any GP prescriber with fewer than five residents who had CVD and/or stroke was excluded from the analysis as inclusion led to spuriously high or low prevalence of aspirin prescribing (11 GPs). Figure 1 shows the prevalence and variability of aspirin prescribing by facility and prescriber. The mean prevalence of aspirin prescribed was 59.5% (SD 22.0%) for those GPs with five or more residents in the study. There was a wide variability in aspirin prescribing between GPs and facilities, with the prevalence of aspirin prescribing ranging from 0.09% (Facility #106 – GP #24) to 100% (Facility #104 - GP #17 and Facility #111 - GP #21). Facilities #102 and #106 were serviced by the same GPs (GP #15 and GP #24) and yet Facility #102 had a higher proportion of residents on aspirin than Facility #106. This phenomena occurred with both GPs. There was also a wide variability in aspirin prescribing within each residential care facility. Aspirin use varied by 20% or greater according to GP prescriber for all residential care facilities that had two or more GP prescribers (#102, #104, 1#06, #111 and #112). For Facilities #104, #106 and #111, the range in aspirin prescribing was over 50%.

Patterns of statin prescribing

Overall, there were a total of 323 residents with cardiovascular disease, stroke and/or dyslipi-

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Figure 1. Patterns of aspirin use in those with high cardiovascular risk in 14 aged residential care facilities in Auckland.

Figure 2. Patterns of statin use in those with high cardiovascular risk in 14 aged resdiential facilities in Auckland.



demia (60.1%). From this total, 99 residents were prescribed statins (30.7%). Figure 2 shows the variability of statin prescribing by GP and by residential care facility. As with the analysis of aspirin prescribing, GPs with fewer than five residents with CVD, stroke and/or dyslipidemia were excluded from the analysis (11 GPs). The mean statin use was 30.3% (SD 17.1%). Similar levels of variability in prescribing patterns were seen when the GP or the facility of residence were considered.

Discussion

The findings of this residential care study indicate wide variations in the prescribing by GPs, of aspirin and statins for older adults with established cardiovascular and/or cerebrovascular disease. This variability in the prescribing of aspirin and statins was seen across different GP prescribers and across residential care facilities and did not appear to be consistently related to either. In general the prescribing of aspirin for secondary prevention was much lower than the rates one would expect according to adherence to the cardiovascular risk management guidelines.

This study is limited by the lack of clinical information available regarding contraindications to the prescribing of aspirin and statins in individual residents. Such considerations include gastrointestinal bleeding preventing the use of aspirin, and liver disease preventing the use of statins. This could have resulted in an over-estimation of those eligible for aspirin or statin use. Secondly information regarding resident or family choice about either medication remains unknown. In both regards, the study may have misinterpreted the under-use of aspirin and statins. Thirdly, the significance of the results was limited by the small number of residents in each residential care facility and small number of residents per prescriber. A larger study is needed to increase the generalisability of the data generated in our study. Further, there was no formal inter-rated reliability testing regarding data collection. However, the nurses were very experienced and had completed three other studies in residential care. Finally, additional demographic information, including the percentage of practice time spent in residential care for each GP, would allow a more balanced comparison amongst the GPs.

The New Zealand Guidelines Group recommends that aspirin 75–150mg/day be given routinely and continued for life after an MI or a stroke.⁴ As such, we expected the patterns of aspirin use to be high in this representative sample of residential care patients. We also expected the prescribing patterns to be similar across different GP prescribers and across the 14 residential care facilities. The findings of this NZ study are better than prescribing rates in residential care in the USA in 2002,¹² and similar to other international studies quantifying variation in prescribing rates for secondary preventative therapies for ischaemic heart disease.¹³ Our study confirms variability in the use of aspirin and statins found across geographical regions, gender, age¹³ and health care needs indicators.¹⁴

There may be several reasons for the low prescribing rates for aspirin and statins found in this study, despite the availability of the New Zealand guideline. Firstly the low uptake in aspirin could be due to less preventative therapy being prescribed to older disabled people. This may stem from the societal level ageist attitude about the use of preventative therapy in older people, with the reluctance to adhere closely to guideline recommendations.¹³ A second reason may be the concern for major side effects such as gastrointestinal bleeding,¹⁵ despite the positive risk to benefit ratio and the demonstrated benefits for those with high cardiovascular risk.⁹

Are older people being offered a consistent level of care? The wide variability in prescribing patterns across GPs may be due to uncertainty in prescribing secondary preventative therapies. This could partially explain the difference between the observed patterns of aspirin and statin use as a secondary preventative measure despite guidelinerelated indications for benefit. Aspirin is a wellestablished secondary preventative measure, while the use of statins as a secondary preventative measure on the other hand remains controversial.

Are guidelines appropriate for all prescribing decisions about older people? Guidelines are expected to be adapted to the clinical scenario related to individuals. GPs could actively decide not to offer aspirin and/or statins, or they could overlook high CVD risk in the context of residential care. After all, others have found that prescriber variability exists across many settings.¹⁶ That is, not all GPs follow evidence-based guidelines all the time. Do we need more education towards evidence-based practice and audits of medication prescribing for all, or do we need an ongoing societal level debate about preventive care for older people particularly for the most vulnerable group, those in residential care, as has been called for?¹²

Conclusion

Levels of aspirin and statin prescribing in residential care are lower than suggested by the NZ guidelines. Aspirin is the most cost-effective anti-platelet agent for reducing cardiovascular events in people following MI or stroke.⁴ The study findings are limited by the size of the study and insufficient clinical information which may under-represent aspirin and statin prescribing in residential care in NZ. Guidelines suggest an increase in the prescribing of aspirin by GPs will benefit people in residential care with cardiovascular risks. Provider education may be worthwhile to bring the prescribing practices closer to the level suggested by guidelines.

Refefences

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COMPETING INTERESTS None declared.