کارگاه‌های آموزشی مرکز اطلاعات علمی

مقاله نویسی علوم انسانی

اصول تنظیم قراردادها

آموزش مهارت های کاربردی در تدوین و چاپ مقاله
Polypharmacy and Falls in the Elderly: A Literature Review

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ABSTRACT

Context: Medications are taken to ease, control or cure ailments. They are effective and safe if used correctly. In the elderly, disorders that occur as a result of ageing, frequently require treatment, resulting in increased use of medications. Polypharmacy is common among the elderly and although it can be therapeutic in nature, is linked to adverse events such as falls.

Evidence Acquisition: A review of the literature was conducted. English articles in Cinahl, Medline and Healthsource (2000-2012) were searched for links between polypharmacy and falls in older adults aged 65 years old and over. Articles not meeting the age criterion were excluded. Search terms included falls, polypharmacy, medications, multiple medications, medicines, elderly, aged. A total of 120 articles were retrieved from the Literature search.

Results: Sixteen articles were included in the literature review. Four literature reviews, three observational prospective cohort, three cross-sectional, three case-control, one longitudinal study and two retrospective cohort studies were examined. Many studies were able to demonstrate a link between the number of medications taken and risk of falls however the potential for bias resulting from confounding by indication was high due to study design in many cases.

Conclusions: Polypharmacy as an independent variable has been linked to falls in older people, however there appears to be a stronger link between falls and the type of medications taken (e.g. medications known to increase risk of falls), rather than polypharmacy on its own. Polypharmacy can sometimes be therapeutic and it may be more beneficial to consider terms such as ‘inappropriate prescribing’ or potentially inappropriate medications’ when considering the effects of medication on falls in older adults. Polypharmacy in older people is often viewed in a negative light due to the increased risk of adverse events, including falls. This article examined current knowledge on the characteristics that define polypharmacy, its effect on falls in elderly people and provided recommendations for future research. Further research utilizing prospective and intervention studies are needed to clarify the causal relationship between polypharmacy, comorbidities and fall risk.

Keywords: Polypharmacy, Falls, Older people, Literature review

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Implication for health policy/practice/research/medical education:
Falls affect approximately one third of older people. Falls can cause moderate to severe injuries, such as hip fractures and head injuries, and can increase the risk of early death and reduce quality of life. Fortunately, falls are a public health problem that is largely preventable. The link between multiple medicine use and falls in the elderly is often discussed but not widely investigated, partly because older people do not always discuss their falls with their health care provider. To reduce the risk of falls, health professionals need to understand the causative factors and learn to be anticipatory when conducting assessments. As people age their use of medications generally increase, therefore research into the adverse effects of medication use on the mortality of older individuals is needed for increased understanding.

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1. Context

In any two-week period, nine out of ten elderly Australians take at least one medication (1). The presence of co-morbidities, age-related physiological changes and an ageing population means that older people are frequently prescribed a high number of medications, often referred to as polypharmacy (2).

Polypharmacy is linked to increased risk of adverse drug events in older people due to increased risk of drug interactions, lack of adherence to medication regimes, susceptibility of older people to side effects of medications, and physical changes related to ageing causing difficulties in taking medications as intended (2, 3).

In Australia, adverse drug events are responsible for more than 30% of unplanned admissions to hospital in elderly people 75 years and over (4). Also, repeated admissions related to adverse drug events have increased at a much greater rate than ‘first-time’ admissions for adverse drug events (5).

One adverse event that can be related to medications and polypharmacy in the elderly is falls. Falls are known to be a serious health problem for older people (6, 7). As the percentage of elderly adults in the Australian population grows, falls in this group have come to the forefront as a serious and growing health concern. Approximately 30% of community-dwelling older people fall each year and the consequences of these falls can be catastrophic, resulting in loss of quality of life, fear of falling, depression and general lack of self-confidence.

Medications are often associated with an increased risk of falls and it is generally accepted that the risk of falls increases with the number of medications taken, with those taking four or more medications at greater risk of falling (8-12). Furthermore, the type of medications or specific medications ingested has been shown to significantly influence the fall risk (7).

Despite an abundance of literature on the subject, there is no universally accepted definition of polypharmacy. It is defined in the literature as the use of a number of medications taken at the same time, the number of medications varies from 2 to 5 or more, depending on the study (8, 10). Some definitions include over the counter and complementary medications, while others consider prescription medications only (8, 10). Some studies use a list of characteristics to define polypharmacy, regardless of the number of medications taken; for example unnecessary or excessive use of medications (13). Brager and Sloand (2) define polypharmacy as the use of two or more medications with the following characteristics:

• To treat the same condition
• Of the same chemical class

• With the same or similar pharmacologic actions to treat different conditions

The authors highlight that polypharmacy should not always be considered in a negative light, and it is sometimes an appropriate and therapeutic treatment strategy. Brager & Sloand (2) consider different types of polypharmacy and believe ‘irrational polypharmacy’ to be the type that can have detrimental effects on older people.

Some authors do not use the term polypharmacy at all, instead opting for terms such as ‘inappropriate prescribing’ or ‘potentially inappropriate medications’ to explain the phenomenon of polypharmacy and how it affects older people (3, 14).

Falls in the elderly population are recognized as a leading cause of mortality and morbidity with increased hospitalizations and drain on health systems. This paper reports on published literature examining polypharmacy as a risk factor for falls in the elderly and provides information on how to address the gaps in knowledge.

The purpose of this literature review was to establish published theoretical viewpoints on polypharmacy as a risk factor for falls in the elderly and produce an overview on the subject.

2. Evidence Acquisition

Medline, CINAHL and HEALTHSOURCE databases were searched for original English articles published between January 2000 and September 2012. Search terms included falls, polypharmacy, medications, multiple medications, medicines, elderly, aged.

Cochrane Library reference lists and retrieved articles reference lists were examined for articles not already retrieved. A total of 120 articles were retrieved from the Literature search.

Abstracts of the original 120 articles found through the literature search were read. The following criteria were used to exclude articles:

• Sample aged below 65 years of age (or a mean age of less than 65 years)
• Sample did not include community-dwelling older adults
• Studies/articles relating to specific classes of medications
• Studies/articles that did not clearly demonstrate a link between polypharmacy and falls in older adults
• Articles that discussed falls risk factors, but did not include medications or polypharmacy

Twenty-four articles remained after sorting, based on the above criteria. Eight Of these 24 articles were excluded as they were information-based articles only, not literature reviews or reports of research studies.

The remaining 16 articles were included in this literature review (Table 1).
Table 1. Summary of Articles Included in the Literature Review

<table>
<thead>
<tr>
<th>Author</th>
<th>Study/Article Type</th>
<th>Number of Participants</th>
<th>Age of Participants, Years</th>
<th>Definition of Polypharmacy</th>
<th>Association with Falls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buatois et al. 2010</td>
<td>Population-based Prospective study</td>
<td>1618</td>
<td>Over 65</td>
<td>Four or more medications</td>
<td>Four or more medications/day a variable that can predict falls</td>
</tr>
<tr>
<td>Fick et al. 2008</td>
<td>Retrospective, Cohort</td>
<td>17,971</td>
<td>Over 65</td>
<td>Potentially inappropriate medications</td>
<td>Higher incidence of falls, hip and femur fractures than comparison group</td>
</tr>
<tr>
<td>Freeland et al. 2012</td>
<td>Retrospective Cohort</td>
<td>118</td>
<td>Over 65</td>
<td>Four or more medications</td>
<td>14% increase in fall risk with the addition of each medication beyond a 4 medication regimen</td>
</tr>
<tr>
<td>French et al. 2005</td>
<td>Case-control</td>
<td>2212</td>
<td>Median age 77</td>
<td>-</td>
<td>Linked to combination of meds known to cause falls</td>
</tr>
<tr>
<td>Gallagher et al. 2007</td>
<td>Literature review</td>
<td>Over 65</td>
<td>Inappropriate prescribing</td>
<td>Linked to a range of adverse reactions in older adults, including falls</td>
<td></td>
</tr>
<tr>
<td>Ganz et al. 2007</td>
<td>Literature review</td>
<td>Older people</td>
<td>Older people</td>
<td>-</td>
<td>Links to number and type of medications taken</td>
</tr>
<tr>
<td>Hartikainen et al. 2007</td>
<td>Systematic literature review</td>
<td>Older people</td>
<td>Older people</td>
<td>Four or more medications</td>
<td>Increased number of medications associated with inc falls</td>
</tr>
<tr>
<td>Kelly et al. 2003</td>
<td>Case-control</td>
<td>2278</td>
<td>Over 66</td>
<td>-</td>
<td>Increased risk of falls associated with types of medications rather than number</td>
</tr>
<tr>
<td>Kojima et al. 2011</td>
<td>Cross-sectional study</td>
<td>262</td>
<td>mean age 76.2 ± 6.8</td>
<td>Multiple drug use</td>
<td>Polypharmacy rather than number of comorbidities was associated with fall risk</td>
</tr>
<tr>
<td>Kojima et al. 2012</td>
<td>longitudinal observational study</td>
<td>172</td>
<td>mean age 76.9 ± 7.0</td>
<td>Multiple drug use</td>
<td>Polypharmacysy associated with falls</td>
</tr>
<tr>
<td>Lawlor et al. 2003</td>
<td>Cross-sectional study</td>
<td>4050</td>
<td>-</td>
<td>Falls increased with increase in number of medications as with increase in comorbidities</td>
<td></td>
</tr>
<tr>
<td>Tromp et al. 2001</td>
<td>Prospective cohort study</td>
<td>1285</td>
<td>Over 65</td>
<td>-</td>
<td>Four or more medications increases risk of falls</td>
</tr>
<tr>
<td>Veehoff et al. 2000</td>
<td>Literature review</td>
<td>Older people</td>
<td>Older people</td>
<td>Two or more medications</td>
<td>Standard of literature poor, need for further research</td>
</tr>
<tr>
<td>Weber et al. 2007</td>
<td>Prospective study with control group</td>
<td>620</td>
<td>Over 70</td>
<td>Four or more medications</td>
<td>No significant reduction in falls intervention group</td>
</tr>
<tr>
<td>Wilson NM, Hilm er SN, March LM, et al.</td>
<td>Retrospective study from RCT</td>
<td>602</td>
<td>Mean age was 85.7 ± 6.4,</td>
<td>number of different medications</td>
<td>DBI is significantly and independently associated with falls in older people</td>
</tr>
<tr>
<td>Ziere et al. 2005</td>
<td>Population-based Cross-sectional study</td>
<td>6928</td>
<td>Median age 70.6</td>
<td>Four or more medications</td>
<td>Risk of falling increases with number of medications used/day</td>
</tr>
</tbody>
</table>

3. Results

Of the reviewed sixteen articles there were four literature reviews, three observations of prospective cohorts, three cross-sectional, three case-control, one longitudinal study and two retrospective cohort studies. Sample sizes in relevant studies ranged from 118 (15) to almost 18,000 (14).

The most common definition of polypharmacy used in the studies was ‘the use of four or more medications’ (12, 16-18). Despite making references to polypharmacy, five studies did not include a definition. However, polypharmacy was not the primary theme of these studies (9, 11, 19, 20). All but two papers identified links between polypharmacy and falls. Some studies cited links be-
Polypharmacy and Falls in the Elderly

Hammond T et al.

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References

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