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Feature Article

A literature review: Polypharmacy protocol for primary care

Mary Skinner, MSN, APRN [a,b,*]

[a] University of Kentucky, College of Nursing, USA
[b] University of Louisville, School of Nursing, USA

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ABSTRACT

The purpose of this literature review is to critically evaluate published protocols on polypharmacy in adults ages 65 and older that are currently used in primary care settings that may potentially lead to fewer adverse drug events. A review of OVID, CINAHL, EBSCO, Cochrane Library, Medline, and PubMed databases was completed using the following key words: protocol, guideline, geriatrics, elderly, older adult, polypharmacy, and primary care. Inclusion criteria were: articles in medical, nursing, and pharmacology journals with an intervention, protocol, or guideline addressing polypharmacy that lead to fewer adverse drug events. Qualitative and quantitative studies were included. Exclusion criteria were: publications prior to the year 1992. A gap exists in the literature. No standardized protocol for addressing polypharmacy in the primary care setting was found. Mnemonics, algorithms, clinical practice guidelines, and clinical strategies for addressing polypharmacy in a variety of health care settings were found throughout the literature. Several screening instruments for use in primary care to assess potentially inappropriate prescription of medications in the elderly, such as the Beers Criteria and the STOPP screening tool, were identified. However, these screening instruments were not included in a standardized protocol to manage polypharmacy in primary care. Polypharmacy in the elderly is a critical problem that may result in adverse drug events such as falls, hospitalizations, and increased expenditures for both the patient and the health care system. No standardized protocols to address polypharmacy specific to the primary care setting were identified in this review of the literature. Given the growing population of elderly in this country and the high number of medications they consume, it is critical to focus on the utilization of a standardized protocol to address the potential harm of polypharmacy in the primary care setting and evaluate its effects on patient outcomes.

Introduction

There is a lack of consensus on the definition of polypharmacy among health care professionals. The two most common definitions are the use of potentially inappropriate drugs and the concurrent use of five or more medications including prescription and over-the-counter drugs (Bushardt, Massey, Simpson, Ariail, & Simpson, 2008[1]). Polypharmacy is distinct from polymedicine, which is the use of many medications to treat multiple health problems (Michoki, 2001[2]). The elderly, defined as those aged 65 years and older, have on average six co-morbid chronic conditions that require multidrug therapy to cure, slow progression, or reduce the symptoms of disease (Bushardt et al., 2008[1]). Evidence based guidelines recommend several drugs in the treatment or prevention of a single medical condition such as in the case of diabetes mellitus or heart failure (Viktil, Blix, & Reikvam, 2008[3]). The elderly tend to consume more over-the-counter (OTC) products than any other demographic group and account for 30% of OTC drug use in the U.S. (Francis, Barnett, & Denham, 2005[4]; National Council on Patient Information and Education, 2010[5]). Consequently, elderly patients likely take several medications, both prescription and OTC, concurrently. There is a multiplicative relationship between the number of medications and the number of drug-related problems that occur; with each additional medication, the number of adverse reactions rises exponentially (Zurakowski, 2009[6]).

The U.S. Census Bureau projects that by the year 2020 there will be 55 million people over the age of 65; this group will represent 20% of the U.S population and consume 50% of health care costs (Vincent & Velkoff, 2010[7]). Prescriptions for the elderly, account for 25%–40% of all prescriptions written in the United States (Ferrario, 2008[8]). Studies have found that a larger number of medications used by a patient leads to an increased risk of adverse drug reactions and events, poorer patient compliance, and a larger economic burden (Bregnhoj, Thirstrup, Kristensen, Bjerrum, & Sonne, 2009[9]). Other consequences of polypharmacy include: drug–drug interactions leading to hospitalization; change in functional status; cognitive impairment; urinary incontinence; and

* Corresponding author.
E-mail address: marytgeo@gmail.com.

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change in nutrition status (Maher, Hanlon, & Hajjar, 2014[10]). Adverse drug reactions and other medication-related problems such as falls and hospitalizations are associated with significant mortality; over 100,000 deaths occur annually in the U.S. due to medications at a cost of $85 billion each year (Bilyeu, Gumm, Fitzgerald, Fox, & Selig, 2011[11]). The relatively high rates of medication use by elderly in combination with the physiologic changes associated with aging such as decreased renal output, hepatic function, serum albumin levels, and total body water and lean body mass increase the prevalence of medication associated mortality (Bushardt et al., 2008[1]).

Purpose

The use of medications is essential for treating chronic health conditions and maintaining quality of life. The use of potentially inappropriate medications is a known risk factor for adverse drug reactions in the elderly along with polypharmacy and inconsistent adherence to the drug regimen (Bilyeu et al., 2011[11]). Inappropriate prescribing is an umbrella term for uncontrolled polypharmacy, under-prescribing, the prescription of medications that have more potential risk than benefit, and poor prescribing practices by health care providers that lead to adverse drug events (Penge & Crome, 2013[12]). When a medication is used incorrectly or prescribed inappropriately, it can cause physical or psychological harm to a patient (Lam & Cheung, 2012[13]). This can lead to increased health care utilization and expenditure. Appropriate prescribing by a health care provider is the fundamental first step in the proper use of a medication (Lam & Cheung, 2012[13]). Evidence-based prescribing and following guideline directed therapy allows the prescriber to be more confident and avoid adverse outcomes. However, if the medication has the potential for more risk than benefit to a patient or a safer, more effective alternative is available, this medication is considered inappropriately prescribed (Lam & Cheung, 2012[13]).

Improving prescribing practices and decreasing adverse drug events in the elderly would have significant health and financial benefits. To produce these results, improved medication reconciliation and prescribing by the health care provider must be initiated to reduce the number of potentially inappropriate medications prescribed for elderly patients. The purpose of this literature review is to critically evaluate evidence-based protocols on polypharmacy in elderly patients in the primary care.

Methods

Using the key words “protocol,” “guideline,” “geriatrics,” “elderly,” “older adult,” “polypharmacy,” and “primary care,” the OVID, CINAHL, EBSCO, Cochrane Library, Medline, and PubMed databases were searched. Articles published in the 15 year period from 1998 through 2013 was chosen for review of the most current state of the evidence. One article published in 1992 was included because it contained a well-documented and applied screening instrument for practice. Inclusion criteria were: articles in medical, nursing, and pharmacology journals with a protocol or clinical practice guideline or other clinical strategy for polypharmacy that led to fewer adverse drug events as the outcome variable. A clinical practice guideline is designed to support decision-making processes in patient care with content based on a systematic review of the clinical evidence. A protocol is viewed as more specific than a guideline, as it provides a comprehensive set of criteria outlining the management steps for a single clinical condition (Field & Lohr, 1992[14]). Qualitative and quantitative studies were included. Sixteen articles met the criteria for inclusion in this review.

The articles were reviewed using the categories of: (a) Author (Date); (b) Type of study; (c) Sample; (d) Purpose; (e) Findings; (f) Implications; (g) Evidence level; and (h) Strength of evidence. They were further grouped into subheadings of: Clinical Strategies, Algorithms, Acronyms, Guidelines, and Screening Instruments. The Hierarchy of Evidence Rating System used was the Strength of Recommendation Taxonomy (SORT) (Ebell et al., 2004[15]). This system rates the evidence from Levels A to C, with Level A being consistent, good-quality patient-oriented evidence. Level B is inconsistent or limited-quality patient-oriented evidence, and Level C is consensus, disease-oriented evidence. The SORT system also is used to assess the quality of evidence of the studies where Level I is the highest and Level III is the lowest.

Results

The search yielded 16 articles that describe a broad range of approaches to address polypharmacy in the elderly including: screening instruments to reduce the prescription of inappropriate medications by health care professionals, expert clinical opinion strategies or recommendations, an algorithm for reducing or discontinuing medications, mnemonics for use by clinicians while reconciling a medication list, and clinical practice guidelines. Key findings from the articles are summarized in the following sections and in the Appendix.

Screening instruments

Screening instruments in the literature can be applied in clinical practice to allow for closer monitoring of drug use, application of interventions to decrease adverse drug events in the elderly, and better patient outcomes. Four screening instruments were located in the literature: the American Geriatrics Society (2012[16]) Beers Criteria; the Screening Tool of Older Person’s Prescriptions (STOPP) (Gallagher, Ryan, Byrne, & O’Mahony, 2008[17]); the Medication Appropriateness Index (MAI) (Hanlon, Samsa, Weinberger, Uttech, Lewis, & Feussner. 1992[18]); and the Hyperpharmacotherpay Assessment Tool (HAT) (Bushardt et al., 2008[1]).

The American Geriatrics Society (2012[16]) updated the 2001 Beers Criteria to: improve the selection of prescription drugs by clinicians and patients; evaluate patterns of drug use within populations; educate clinicians and patients on proper drug usage; and evaluate health-outcomes, quality of care, cost, and utilization data. This Systematic Review (Level I Evidence, SORT A) encompasses 53 medications or medication classes divided into three categories: potentially inappropriate medications and classes to avoid in older adults; potentially inappropriate medications and classes to avoid in older adults with certain diseases and syndromes that the drugs listed can exacerbate; and medications to be used with caution in older adults. Limitations of the Beer’s Criteria are that it does not address potentially inappropriate medications (PIMs) commonly prescribed to older adults including drug–drug interactions, dosing of drugs in renal impairment, and therapeutic duplication (Penge & Crome, 2013[12]). It also does not provided a list of alternative medications, requiring the provider to have patient specific judgment. According to Penge and Crome (2013[12]), little evidence supports the use of the Beer’s Criteria in terms of clinical outcomes and lack of significant associations between PIMs and adverse drug reactions.

Gallagher et al. (2008[17]) developed the Screening Tool of Older Person’s Prescriptions (STOPP) to incorporate potentially inappropriate medication use in the elderly, including drug–drug interactions and duplicate class prescribing, using a Delphi consensus technique with an 18-member expert panel (Level I evidence, SORT A). Sixty-five medications were identified and agreed upon by the