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Potentially Inappropriate Medication Due To Polypharmacy in Geriatrics

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ABSTRACT
Elderly patients experience drug related harm, a major problem due to increase in drug consumption. There is a high prevalence of multimorbidity and polypharmacy among patients. As a result, advanced information of medication use practices between elderly is necessary towards reducing medication related damage. Prescribing guidelines for geriatrics can be done by reducing current drug therapy without indication, by prescribing new medication with clear indication, simple drug regimen and suitable drug administration. In some individuals with complex medical conditions or multiple medical conditions referred as multimorbidity; increased number of drug uses indicatespolypharmacy. Potentially inappropriate prescribe can be evaluated by using criteria such as Lager's criteria, LaRochecriteria, EU-7 criteria,STOPP/START criteria and Beer's criteria. Hence Medication review and E-Prescribing a tool to optimize drug usage in geriatric patients and

Keywords: Potentially Inappropriate Medications, Polypharmacy, Geriatrics, Adverse Drug Reactions, Beer's Criteria**,**Medication Review

I. INTRODUCTION

Medication related detriment in geriatrics adults is one of the greatest public health challenges worldwide due to comorbidities of chronic diseases such as Cardiovascular disease, Respiratorydiseases, Joint disorders and psychiatric disorders, various pharmacokinetics and pharmacodynamics leads to polypharmacycaused by prescribed drugs. As a result, older people are more susceptible to adverse drug reactions (ADRs).(1)Therefore, with polypharmacy acting empirically unavoidable many of the geriatric affectedperson population , an advancedinformationof medication use practices amongst geriatrics is important in growingnationstowardlowering medicine-associateddamage and relatednegativefitness outcomes.(2)By measuring the number of prescribed medicines received the medicine use in older population can be quantified.Accordingly, the level of clinically relevant ADRs due to polypharmacy or complicated polytherapy among a population of patients would additionally provide an estimation of medicine use or the weight of medicine related morbidity and mortality on a healthcare system. (3) Several research have been conducted in most of the developed countries shown that the detailed association between polypharmacy, druginteractions, hospitalizations and also increased healthcare costs.

Prescribing Guidelines For Geriatrics

a) Carry out a regular medication review and discuss and agree all changes with the patient
b) Stop any current drugs that are not indicated
c) Prescribe new drugs that have a clear indication
d) If possible, avoid drugs that have known deleterious effects in elderly patients and recommend dosage reduction when appropriate
e) Use the recommended dosages for elderly patients
f) Use simple drug regimens and appropriate administration systems
g) Consider using once daily or once weekly formulations and using fixed dose combinations when possible
h) Consider non-pharmacological treatments if appropriate
i) Limit the number of people prescribing for each patient if possible
j) Where possible, avoid treating adverse drug reactions with further drugs. (4)

Multimorbidity And Polypharmacy

Polypharmacy is taking more than five drug at the same time. There is no consensus on the number of drugs that define polypharmacy, as complex or multiple comorbidities should be

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treated with a combination of drugs. So while definitions of numbers vary, perhaps the most common definition is taking five or more medications regularly [5]. In some individuals with complex medical conditions or multiple medical conditions referred as multimorbidity, for example, polypharmacy may be appropriate when drug use is individually optimized and prescribed to the best of our knowledge. In contrast, potentially inappropriate polypharmacy, in which the risks of harm from individual drugs may outweigh the benefits in the overall prescribing setting, is associated with decreased adherence to treatment, adverse drug reactions (ADRs) and is associated with an increased risk of drug interactions. One important cause of morbidity and mortality with significant health consequences and associated economic burden[6].

Potentially Inappropriate Prescribing

When there is a lack of indication of a medication, avoidable adverse drug –drug or drug – disease interaction, where the benefit of medicine is less than risk the potentially inappropriate prescribing occurs. [7]PIM's also includes exclusion of beneficial medications that are used for prescribing and mis-prescribing and for the cure or prevention of the disease. [8]A fewapparatuses have been createdto assistdistinguish PIP. A laterefficientaudit that included 42 endorsingevaluationdevices found that as it were 13 had been remotely validated, with hospitalization being the foremost commonly measured patient-related result [9,10] Deprescribingdevices are classified as unequivocal, understood, or a combination of both. Express criteria devices such as Lager's criteria, LaRoche criteria, EU-7 criteria, and STOPP/START criteria ordinarily contain records of drugs or medicate classes that are known to uncovermore seasonedgrown-ups to potential hurts that outweigh their benefits [11,12,13].

Within the STOPP/START criteria, there's moreover a list of 'potential endorsing omissions', i.e., drugs that likelyought to be endorsed in more seasonedindividuals but are not for differentunseemly reasons, countingseen high-level slightness. Understood PIP appraisal tools such as the PharmaceuticalFittingnessFile require information of person treatment objectives and co-morbiditieswithin thesetting of prescribed drug. [14,15]

Due to the age group, change in the pharmacokinetics, pharmacodynamics and multiple co-morbid conditions leads to inappropriate prescribing [16, 17]. Several studies have shown that hospital admission, mortality and adverse drug reactions in geriatric populations due to potentially inappropriate medications. [18, 19, 20]

PIM CRITERIA

Beers et al. [21]published criteria in the United States in 1991 to identify potentially inappropriate prescribing of drugs. Revised version (2003) classified 48 drugs or drug classes that should generally be avoided in elderly patients. Although the Beers Criteria has been internationally accepted and applied, it still needs constant updating and international adaptation. [22]Screening tools for the use of PIM have been developed over the past two decades, with the most recent updated version of the Beers criteria published by the American Geriatric Society (AGS) in October 2015. In addition to updating the existing criteria (i.e. 2012), the 2015 version brings two major new features:

1) Drugs that require dose adjustment based on the patient's renal function

2) Drug-Drug Interactions (DDI).

Goals of the 2015 update on the AGS Beers criteria continue to improve physicians' geriatric care physicians by reducing exposure to PIM. Careful application of criteria as a educational tool and quality improvement measure ensures closer monitoring of drug use in older adults. [23]The updated Beers and McLeod criteria were used to evaluate PIM prescribing. The updated Beers criteria from 2012 identified categories of drugs that geriatric populations should avoid, drugs that should be avoided in certain medical conditions, and drugs that should be used with caution. [24] The McLeod guideline, in which we adopted the criteria related to drugs and doses that should be avoided by the geriatric population, was adopted. The prevalence of PIM was calculated based on the number of patients with at least one PIM criteria in their medical prescription.[25]The assessment in this study was based on the first set of criteria because it has broad and straightforward application and consists of 38 medications.

RATIONAL DRUG USE

Rational use of medications requires that "patients get drugs fitting to their clinical needs, in dosages that meet their possess person necessities, for an satisfactory period of time, and at the most reduced amount to them and their community [25]. Irrational use of medications may be a major issue around the world. WHO gauges that

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more than half of all medicines are prescribed, dispensed or sold improperly, which half of all patients fall flat to require them accurately. The overuse, underuse or misuse of medications comes about in wastage of rare assets and far-reaching wellbeing risks. Irrational use of medicines include use of too many medicines per patient(polypharmacy).Inappropriate use of antimicrobials, typically in inadequate dose, for non-bacterial infections; over-use of injections once oral formulations would be additional appropriate ;failure to bring down in accordance with clinical guidelines; inappropriate self-medication, typically of prescription-only medicines ;non-adherence to dosing regimens.[26]

WHO advocates 12 key interventions to promote more rational use:

- Establishment of a multidisciplinary national body to coordinate policies on medicine use
- Use of clinical guidelines
- Development and use of national essential medicines list
- Establishment of drug and therapeutics committees in districts and hospitals
- Inclusion of problem-based pharmacotherapy training in undergraduate curricula
- Continuing in-service medical education as a licensure requirement
- Supervision, audit and feedback
- Use of independent information on medicines
- Public education about medicines
- Avoidance of perverse financial incentives
- Use of appropriate and enforced regulation
- Sufficient government expenditure to ensure availability of medicines and staff.

Impact Of Mental Health In Geriatrics Due To Polypharmacy

Health status, health needs and activity of the elderly population changed a lot compared toother population groups. To estimate the risk harmful side effects regarding patient's mental health the physician should pay special attention to the medications that the patient receives. Some of the patients with multimorbidity and receiving more than 5 medicationsi.e., polypharmacy may experience inconvenience and get frustrated in taking medications. So, the necessity of each drug prescribed should properly explained to the patient and those experiencing inconvenience should be suggested with a psychiatric counselling by the physician. [27]

OPTIMIZATION OF DRUG USE IN GERITRICS - MEDICATION REVIEW

The national service framework for older people recommends regular medication reviews, with patients taking four or more drugs being reviewed every six months and those taking fewer than four reviewed annually. Drugreviewsnotonlyexamineindicationsfortheuseof existingdrugsandchecktheirdosages,butalsoprovide anopportunitytoidentifyandtreatnewconditions,such asatrialfibrillation,heartfailure,orheartfailure.Alzhei mer'sdisease,theincidenceofwhichincreaseswithage. Elderlypeoplewithcomplexmedicalormedicalneedss houldbereferredtoaspecialistbyageriatrician.
[27]Medication review for all patients prescribed four or more repeat medications is part of the general practitioner contract quality and outcomes framework, and the National Prescribing Centre has issued guidelines details on how to prescribe.[28]

II. CONCLUSION

Prescribing in elderly patients presents challenges, most of which have remained unchanged over the past 20 years [29]. Changes in pharmacodynamics and pharmacokinetics mean that these patients often require lower doses, while at the same time multiple medical problems emerge and subsequent polypharmacy leads to more frequent harmful drug reactions and interactions**.**Reducing inappropriate polypharmacy should be a major aim for preventing ADRs.Electronic prescribing (e-Prescription) aims to reduce prescribing and administration errors by eliminating the risk of errors when creating or reading paper prescriptions.This is a first step towards the overarching goal of integrating the entire patient record across care to minimize errors and delays in communication between healthcare providers. [28]Although several criteria available for identifying the polypharmacy all criteria have their own limitations and cannot be used in all cases and will not provide appropriate outcome we are expecting. There will be several guidelines developed in the future for finding polypharmacy and some of the technical methods such as e-prescribing which also helps in finding the medication errors during prescribing, drug –drug interaction and potentially inappropriate medications due to polypharmacy.

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