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RESEARCH ARTICLE

POTENTIALLY INAPPROPRIATE PRESCRIBING IN ELDERLY: STUDY IN A TERTIARY CARE TEACHING HOSPITAL IN INDIA

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ABSTRACT

Context: Health related problems of elderly in India needs special attention. There are no prescribed guidelines for elderly in India, various physiological and age related factors contribute to unwanted reactions in elderly. In clinical practice it is very difficult for choose an appropriate medication for them. Considering all this problems we need an appropriate prescription pattern for elderly.
Objective: To analyze the prescription appropriateness in elderly using beers and STOPP criteria and to identify the mishaps in prescriptions.
Materials and Methods: All patients having age ≥ 65 years admitted in general medicine department during the study period was observed. Prospective and retrospective data were collected from patient medication record.
Results and Discussion: 43.7% prescriptions showed inappropriateness in prescriptions and beers criteria were identified in more prescriptions.
Conclusion: Inappropriateness in prescriptions common in our hospital and this mishaps point out for careful attention to elderly prescription pattern. Inappropriateness can minimized by selection of appropriate medication and need a team effort also point out the need of a proper guidelines for elderly patients.

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INTRODUCTION

Age nearing the life expectancy called as elderly, WHO defines old age as "age above 65 years ".On average the elderly population taking 3 times as many medications than nonelderly (Bongue *et al*., 2011). Clinical trial in this group is more difficult as the conclusion in the younger population cannot be extrapolated to this group. Elderly population has increased risk of experiencing medication mishaps, because of poly pharmacy and physiological variations. Alterations in the homeostatic mechanisms such as postural control, orthostatic circulatory response, thermoregulation, visceral muscle function, cognitive function, change in specific receptor and target organ functions lead to increased sensitivity and occurrence of adverse drug reactions .Geriatric patients with multiple diseases have higher incidence of practicing polypharmacy. The attempt to reduce the treatment cost ends up in using inappropriate medication use (Emily *et al*., 2011).

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The increased self medication and use of OTC drugs also add up the risk for medication related problem in elderly. Hospital admissions associated with medication mishaps are also higher in them (Fick *et al*., 2007). In clinical practice it is very difficult for physician to choose a appropriate medication for them. Considering all this problems we need an appropriate prescription pattern for elderly. Till this time there is no defined criteria /guidelines for effective and safe therapeutic use of drugs in elderly (Beijer and De Blacy, 2002; Wessell *et al*., 2008).

Several screening tools are proposed to assess the inappropriate prescribing in elderly like beer's criteria, STOPP criteria etc. Beer's criteria were originally proposed in 1991; later on it get revised many times. Currently it last updated in 2012.This list explicitly defines the list of medications that should generally avoided in elderly or with underlying diseases or conditions co-exists (American Geriatric society, 2012). Screening tool for older peoples prescriptions (STOPP), This criteria is expanded and updated for the purpose of minimizing the inappropriate prescription in older peoples (Hilary Hamilton *et al*., 2011).

MATERIALS AND METHODS

Prospective and retrospective observational study was conducted in a 500 bedded tertiary care teaching hospital for a period of 2 months. Inclusion criteria was all patients having age ≥ 65 years admitted in general medicine department during this period. Prospective data collected from the current medication chart and prescriptions. Retrospective data collected from medical records of last past 3 months admissions. Data include diagnosis, medication and laboratory parameter. Objective of our study is to find the medicine use pattern in elderly and to check the prescription appropriateness using beers and STOPP criteria. The Prescriptions that fulfilled Beers or STOPP were identified and the characteristics of these patients were then compared and analyzed for the prescription appropriateness. Total of 490 prescriptions analyzed during this period of time and only 215 were fall under our criteria.

RESULTS

No of patients prescribed with inappropriate medication

a) Only under beers criteria

S.No	Age categorisation	No. of Patients
1	65-69	41
2	70-74	16
3	75-79	20
4	80-84	18

Total of 95 patients, 70 patients were male and 25 were female.

b) Only under STOPP Criteria.

S.No	Age categorisation	No. of Patients
1	65-69	12
2	70-74	17
3	75-79	10
4	80-84	4

Total of 43 patients, 24 were male and 19 were female.

c) Under both criteria.

S.No	Age categorisation	No. of Patients
1	65-69	33
2	70-74	19
3	75-79	17
4	80-84	9

Total of 77, 62 were male and 15 were females.

No. of inappropriate medications in a single prescription

SL.NO	No. of inappropriate medication	No. of patients
1	5	5
2	4	3
3	3	55
4	2	24
5	1	128

Name & class of medications in prescriptions come under these criteria

S.No.	Drug class	List of drugs
1.	Benzodiazepine	Lorazepam, Clonazepam, Alprazolam
2.	NSAID's	Paracetamlol, Diclofenac, Ketorolac
3.	Antipsychotics	Quitiapine
4.	Cardiovascular drugs	Clonidine, amiodarone, digoxin, metaprolol
5.	Anti-infective	Nitrofurantoin
6.	Others	Chlorphenaramine maleate

DISCUSSION

Total of 490 prescriptions under inclusion criteria we screened and 215 (43.8%) prescriptions showed inappropriateness in prescription based on two criteria. Beers criteria were identified in more prescriptions. Medications which are routinely and frequently fall in this criterion are benzodiazepines, among them short and intermediate acting agents alprazolam and lorazepam and long acting clonazepam prescribed to many patients for insomnia and mild agitations and delirium this medication according to beers criteria the older adult are more sensitive than younger peoples to the CNS depressant effect of the benzodiazepines, increased sensitivity to benzodiazepines is because they metabolize drug less efficiently than younger peoples so drug effects last longer and drug accumulation occur with regular use. NSAID's are the next category of agents prescribed in elderly widely, non selective COX2 inhibitors like diclofenac will increase the risk of gastrointestinal bleeding and peptic ulcer disease in high risk groups especially aged >75,taking oral or parentral corticosteroids, anticoagulants or antiplatlets agents Pain medications are widely prescribed among this elderly population irrespective of there co morbidities and concurrent medications.

First generation antihistamines (as a single agent or as a part of combination product they are highly anticholinergic; clearance is reduced with advanced age and tolerance develops when used as hypnotic: greater risk of confusion, dry mouth, constipation and other anti cholinergic effects and toxicity. Chlorpheneramine was seen in the prescriptions and prospectively checked patients showed drug related adverse reactions. Nirofurantion use as an anti infective is also have high strength of recommendation to be avoid in elderly because it may be ineffective for the treatment of urinary tract infections in elderly with reduced renal function, but it is not contraindicated because of nephrotoxicity. Potential for pulmonary toxicity is also pointing (Kunin, 2004). cardiovascular agents including Clonidine, it is a central alpha agonist, having high risk of CNS effects including bradycardia and orthostatic hypotension; not recommended for routine treatment for hypertension. Prescriptions with first line anti hypertensive as clonidine was also there. Quality of evidence is not much strong but strength of recommendation to avoid in elderly is strong. Antiarrhythmic drugs, amiodarone data suggests that rate control yield better balance of benefits and harm than rhythm control for most older patients. amiodarone is associated with multiple toxicities, including thyroid disease, pulmonary disorders and QT-interval prolongation. Recommendations say to avoid these agents as first line

treatment for atrial fibrillation, quality of evidence is to strong and strength of recommendation is also high. Digoxin >.125 mg/day in heart failure, higher doses associated with no additional benefit and may increase the risk of toxicities; slow renal clearance may lead to risk of toxic effects. Antipsychotic medications first generation and second generation increased risk of cerebrovascular accidents (stroke). Conventional antipsychotics also contraindicated in parkinsonism patients (American Geriatric society, 2012). Prescriptions containing the above mishaps are mainly identified with the help of beers criteria.

According to STOPP criteria tricyclic antidepressants with patient with history of chronic constipation was contraindicated, due to the tricyclic have a strong anticholinergic side effects profile. Patients with COPD prescribed with beta blockers mainly metaprolol seen in lots of prescriptions and non selective beta blockers can exacerbate the patient condition. Moderate to severe hypertension patients prescribed with NSAID's, this can worsen the patient hypertension status (Hilary Hamilton *et al*., 2011; Mohd Shahezwan Abd Wahab, 2012). These 3 mishaps are identified with STOPP criteria. Prescriptions having inappropriate medications from both criteria was also there, 78 prescriptions showed the mixed pattern inappropriateness from beers and STOPP criteria together seen in same prescription. Total of 215 prescriptions 125 prescriptions (58.1%) having only one inappropriate medication from either one of this criteria and maximum of 5 inappropriateness seen in a single prescriptions and number of such incidence was only. 023%. Inappropriateness in prescription can result poor health care outcome and increase chance of adverse effects in elderly (Alex *et al*., 2004).

Conclusion

Elderly population are one who need more attention and care in all aspects. Medication mishaps are seen in elderly prescriptions while we screen through beer's and STOPP criteria, 43.8% prescriptions showed inappropriateness in prescription. Age related problems, polypharmacy, co-morbidities, OTC medication use, physician and health care provider's lack of attention all contribute much to this issue.

Mishaps can lead to worsening of patient conditions and increase cost and hospitalizations. Currently no geriatric guidelines are practiced in India. All this point out the need of much study in this field and need of a proper prescription pattern for elderly. Extending clinical pharmacist services can significantly improve rational use of medicines in geriatric population.

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