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Research Article

Inappropriate drug use in hospitalized elderly patients of medicine and cardiology departments at a tertiary care hospital of Northeast India

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ABSTRACT

Background: National committee on quality assurance, USA convened an expert consensus panel and identified the list of drugs which should be avoided in the elderly people. This resulting list of drugs after 2003 beers criteria were added to the 2006 Health Plan Employer Data and Information Set (HEDIS) to assess the drug prescribing in elderly people.

Methods: The objective of this study was to determine the prevalence of inappropriate drug use and assess their predictors in the hospitalized elderly patients of tertiary care hospital by using HEDIS 2006 criteria. A 6-month prospective study was conducted in medicine & cardiology inpatient department of tertiary care hospital by reviewing prescriptions of 502 elderly patients. The patients of either sex having age more than 60 year were included in this study.

Results: It is found that (2.39%) 12 patients received at least 1 inappropriate drug by 2006 HEDIS measure. Out of 12 inappropriate drugs, short acting nifedipine was prescribed to 4 elderly patients followed by dicyclomine to 2 patients and ketorolac to 2 patients each. Increased number (≥11) of concurrent medications use during hospital stay (OR: 0.015, CI: 0.001–0.199, $P = 0.001$) and prolonged (≥5 days) length of stay (OR: 0.039, CI: 0.005–0.291, $P = 0.002$) were found as a predictors of inappropriate medication use.

Conclusion: In this study, low prevalence (2.39%) of inappropriate drug prescribing was found. Multiple medications and long duration of hospital stay were the risk factors for inappropriate medication use.

1. Introduction

Inappropriate multiple medications use is a major patient safety concern, as this irrational symptomatic prescribing practice not only add to the cost and complexity of therapeutic regimens, but also place patients especially vulnerable geriatric patient population at greater risk for adverse drug reactions and drug–drug interactions and jeopardize positive

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therapeutic outcome – including patient experience, health outcomes, overall performance, and with estimates of the financial consequences of the healthcare services.[1]

Although, Beers criteria is the foundation of 2006 HEDIS quality measures, clinicians contend that Beers criteria is too broad and sometimes drugs may be appropriate for specific patients in certain circumstances. The Beers criteria were derived from expert consensus, some experts and clinicians argue that they are not strictly evidence based.[2] In some cases; patients may be in the process of being treated successfully with a potentially inappropriate drug. Thus, Beers criteria have been controversial since their original publication in 1991.[3] Despite controversy about which explicit criteria should be used, there is a strong body of evidence showing that suboptimal prescribing is disturbingly common in elderly patients.[4] Based on Beers criteria, National Committee on Quality Assurance, USA have developed a 2006 Healthcare Effectiveness Data and Information Set (HEDIS) criteria by using modified Delphi process to identify rates of inappropriate prescribing in the elderly.[5] To assess the healthcare quality for elderly people, this measures included the drugs that should usually avoided in the elderly.[6] HEDIS is the most widely reported set of performance measures in the industry, used by health plans, medical groups, federal and state governments.[7] Thus, we have used 2006 HEDIS measures to determine the prevalence of inappropriate drugs and assessed the predictors in hospitalized elderly patient of medicine and cardiology department of the tertiary care hospital in Northeast region of India.

2. Patients and methods

2.1. Study design and setting

The Institutional Ethic Committee approval was taken prior the initiation of study. The prospective study was carried out in an inpatient setting of medicine and cardiology department of the Gauhati Medical College and Hospital (GMCH), Guwahati, Assam. GMCH is the largest and major tertiary care government hospital of the entire northeast region of India, catering to millions of people in this region. This hospital has geriatric clinical setting in medicine department and moreover; elderly patients are more prevalent to cardiovascular diseases; therefore to comprise maximum number of elderly hospitalized patients in this study we have conducted our study in medicine and cardiology departments.

The study data was collected for the period of 6 months from July to December 2010. The elderly patients of either sex were included in the study and written informed consent was taken at the time of enrollment. Each prescription was checked individually from the wards of medicine and cardiology department of hospital for inappropriate drug by 2006 HEDIS Criteria. The inappropriate drugs were collected from the prescriptions of elderly patients and it includes all the medications prescribed, right from admission to discharge of the patient. At the time of data collection the study form was completed with regards to patient's age, diagnosis, all the drugs prescribed during hospital stay, length of hospitalization and study form was updated daily until the patient was discharged. Patients were also interviewed to get the information regarding any self medication and past history of illness. A prescription was said to be inappropriate if it contained one or more drugs included in 2006 HEDIS drug list of inappropriateness. The patients having incomplete information were excluded from the study. The results were represented as average ± standard deviation (SD) and percentages as applicable; age, sex, diagnosis, number of medications and duration of treatments were the variables for determination of predictors. Odds ratio was calculated to assess the most common predictors for inappropriate drug prescribing. Statistical significance ($P < 0.05$) was determined at 95% level of confidence. The data were analyzed using Statistical Package for Social Science (SPSS) Ver. 16.0.

2.2. Modifications

The criteria used in this study required certain modifications which were necessary in the Indian setting. The life expectancy at birth for Indian males and females corresponding to the mid year 2003 was 62.3 and 63.9 years respectively, giving an overall life expectancy as 63.2 years.[8]

Thus the modifications were:

1) The cut off age considered in this study was 60 years or more instead of age 65 years or more and 2) the following drugs were not considered in this study as they were excluded from the drug list of 2006 HEDIS criteria (Table 3). These drugs were Amitriptyline, Doxepin, Indomethacin, Ticlopidine, Methyldopa, Reserpine, Disopyramide, Oxybutynin, Naproxen, Oxaprozin, Piroxicam, Fluoxetine, Amiodarone, Doxazosin, Clonidine, Mineral Oil, Cimetidine, Ethacrynic acid and long term use of stimulant laxatives except with opiate use.

3. Results

3.1. Population characteristics

Out of the 502 patients, 308 (61.35%) were males and 194 (38.64%) were females. The average age of the patients was 66.87 ± 4.71 years, the overall age range being 60–84 years. More than half of the 386 (76.89%) patients belonged to the age group 60–69 years while 105 (20.91%) of the patients belonged to the age group 70–79 years and the remaining 11 (2.19%) patients were more than 80 years of age.

Table 1 – Inappropriate drug use identified by 2006 HEDIS.

Sr. no.	Name of drugs	Severity	No. of patients ($n = 12$)
1	Short acting nifedipine	High	4
2	Dicyclomine	High	2
3	Ketorolac	High	2
4	Nitrofurantoin	High	2
5	Promethazine	High	1
6	Chlorpheniramine	High	1