

POLYPHARMACY AND USE OF POTENTIALLY INAPPROPRIATE MEDICATIONS IN PATIENTS WITH DEMENTIA AND MILD COGNITIVE IMPAIRMENTVIKAS DHIKAV¹, MANSI SETHI, ARJUN KUMAR SINGHAL², KULJEET SINGH ANANDMemory Clinic, Department of Neurology, Postgraduate Institute of Medical Education & Research (PGIMER) & Dr. Ram Manohar Lohia Hospital, GGS-IP University, New Delhi-110001, INDIA., ²Medical Officer, Saket Dispensary, Delhi Government

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*Received: 11 February 2014, Revised and Accepted: 7 March 2014***ABSTRACT**

Objective: Polypharmacy and the use of potentially inappropriate medications (PIM) are common among the elderly worldwide, but there is a paucity of data in patients with dementia in this regard. This study was aimed at assessing the average number of drugs being taken by the elderly patients with dementia presenting to our clinic and whether their prescriptions included the Potentially Inappropriate Medications (PIM) or not.

Methods: In our study we recruited patients who presented to the Outpatient Department of Neurology. The use of PIM was estimated according to the Beer's Criteria. Polypharmacy was defined as the consumption of 5 or more drugs.

Results: We incorporated 143 patients in our study where the ratio of Males: females were 110:33. The mean age of our patients was 70.1 ± 10.1 years. Out of all the patients recruited, 55 had mild cognitive impairment, 45 patients had Alzheimer's disease, 30 had vascular dementia and a minority had fronto-temporal dementia (3), progressive primary aphasia (7) and dementia with Lewy bodies (3).

Out of the 143 patients of dementia in our study, 60 patients were taking drugs having the potential to cause cognitive impairment. Distribution of these drugs was as follows: beta blockers (by 10 patients), trihexyphenidyl (THP) (by 3 patients), carbamazepine (2), olanzapine (7), tolterodine (3), oxybutynin (2), amitriptyline (3), loperamide (2), zolpidem (25) and alprazolam (3). According to our study majority of the medications having the potential to cause cognitive impairment were prescribed by psychiatrists (27 patients), followed by physicians (23 patients) and Neurologists (10 patients).

Among the 25 patients taking Zolpidem, 18 were taking 10mg per day while 7 were taking 5mg per day. A total of 86 patients were receiving other medications like multi-vitamins (55), calcium (20) and vitamin D (11). Lastly the average number of drugs being consumed by elderly patients with dementia was 8.24 ± 3.2 .

Conclusion: Drugs having the potential to cause cognitive impairment were being prescribed to patients already suffering from dementia or mild cognitive impairment. A number of patients are consuming multivitamins and many a times these are prescribed without assessing whether they are actually needed in the patient or not. Also the prevalence of polypharmacy in Indian prescriptions is evident according to our study.

Keywords: Alzheimer's disease, polypharmacy, potentially inappropriate medications, cognitive impairment, dementias, mild cognitive impairments, elderly.

INTRODUCTION

Polypharmacy and the use of Potentially Inappropriate Medications (PIM) is a common clinical problem among the elderly worldwide. A reported definition [1] of Polypharmacy is the intake of five or more drugs. Alternatively, it has also been defined as the introduction of at least one unnecessary medication over and above the required ones [2]. Hazards of using multiple drugs in elderly have been well recognized and include frailty, disability, mortality, and falls in the elderly [1]. These also have the potential to contribute to mortality in patients with advanced cognitive impairment [3]. Apart from increasing the risk of drug interactions [4] and producing undue side effects, polypharmacy also has the potential to negatively affect cognition in the elderly [5]. A previous study mentioned a higher prevalence of chronic diseases and degenerative pathologies increase the demand for prescription of a number of medications and to improve the quality of life and wellbeing of patients but on the other hand, make them susceptible to the risk of polypharmacy and drug related illnesses including cognitive impairment [6]. It is important to know however, that drug induced cognitive impairment is reversible [7]. Though previous studies have examined the prevalence of PIM in the healthy elderly people, we

wanted to assess if the same is true for patients with dementia and Mild Cognitive Impairment (MCI).

MATERIALS AND METHODS

We recruited patients who reported to the Outpatient Department of Neurology, at a tertiary care hospital in New Delhi. These patients were asked to attend the memory clinic for detailed evaluation. National Institute of Neurological and Communicative Disorders and Stroke (NINCDS-ARDA) criteria were used for diagnosis of Dementia of Alzheimer's type. MCI was diagnosed using Clinical Dementia Rating Scale (CDR=0.5). Other dementias were diagnosed clinically. The details regarding the number of drugs being taken, their dosages and duration was noted from the written clinical records of the patients. The Standard Diagnostic Criteria for the diagnosis of other dementias were applied. Use of ≥ 1 inappropriate medications according to the modified American Geriatric Society updated Beers Criteria, 2012 was labeled as PIM [8]. Polypharmacy was defined [1] as the intake of five or more drugs.

Statistics

At a confidence level of 95%, confidence interval of 0.05, a proportion of 0.5, and the standard error of 0.02, the sample size required for the present study was 140. A systematic random sampling was done (k factor=1.5). Based upon the sample size, every 2nd patient coming to the Outpatient Department was recruited to the study.

RESULTS

The demographic data of our study population is presented below

Table-1: It shows Demographic data of the study population

N=143
 Male: female: 110:33
 Mean age: 70.1 ± 10.1years

Our study lasted for one year (July 2012 to July 2013). There were 55 patients with mild cognitive impairment, 45 with Alzheimer's disease, 30 with vascular dementia and the rest had fronto-temporal dementia (3), progressive primary aphasia (7), and dementia with lewy body (3) respectively. A total of 60 patients were taking the drugs having potential to cause cognitive impairment

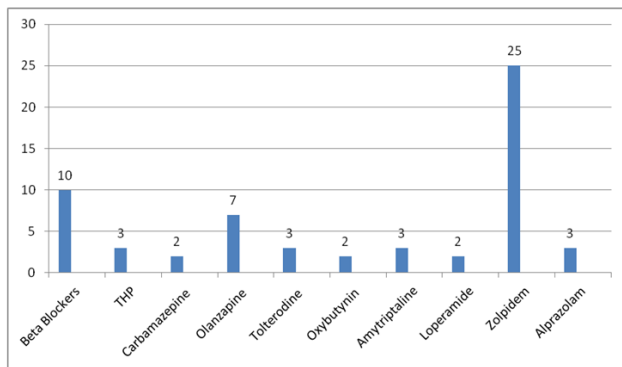


Fig.1: It shows distribution of drugs having the potential to cause cognitive impairment and the number of patients taking them.

Out of the 25 patients taking zolpidem, 18 were taking 10 mg per day while 7 were taking 5mg per day. The average number of drugs being taken by the elderly was 8.24±3.2. A total of 86 patients were receiving other drugs including multi-vitamins (55), calcium (20) and vitamin D (11).

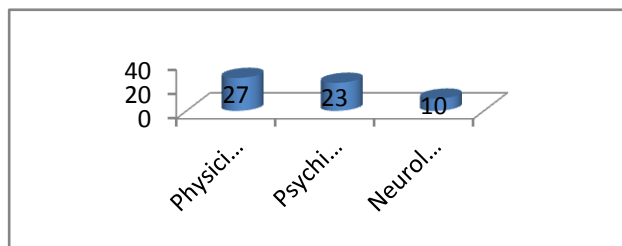


Fig.2: It shows the number of patients consuming drugs having the potential of causing cognitive impairment against the various medical processional prescribers

DISCUSSION

Polypharmacy and the use of PIM are a common practice worldwide and are perhaps more common in the elderly [8]. Unfortunately, this is the most vulnerable group as far as the side effects of using multiple drugs is concerned. Likewise, demented elderly make an even more vulnerable group because of a reduced body mass, forgetfulness and proneness to adverse effects of psychoactive drugs due to a reduced size of the brain as a result of dementia. As per one estimate, the cost of preventable PIM is more than 50 billion US

Dollars [9]. Hazards of polypharmacy in the elderly are well recognized (Table-2).

Table-2: It summarizes pitfalls of polypharmacy in the elderly

- Increased rate of adverse drug reactions
- Adverse consequences due to drug interactions
- Errors in taking medications correctly due to their higher number
- Poor compliance
- Monetary concerns

The present study has analyzed the frequency of prescription and intake of drugs by the elderly patients of dementia that have the potential to further compound the cognitive impairment and also amount to polypharmacy. Importantly, this study does not conclude that drugs being consumed used were the reason behind the cognitive impairment in our patients. However, certain amount of impaired cognition in these patients could certainly be attributed to these drugs as they are known to affect cognition adversely.

One of the important findings in the present study was the high number of drugs being taken by the elderly presenting to our clinic. Elsewhere, female sex has been associated with polypharmacy [10]. Most of our patients were males, reflecting a sex bias in reporting to medical clinics in India [11, 12]. Number of drugs that the elderly patients consume could contribute to their cognitive decline [13]. Prevalence of polypharmacy in the elderly is around 50% [13] and this includes both drugs for general conditions and psychotropic medications [14]. A recent large study of community dwelling elderly with Alzheimer's disease found the prevalence of polypharmacy to be 2/3 [15]. In this study, anticholinergic drugs were being given along with cholinergic agents in 16% cases. In our study also the findings were similar (14%). We could find only one other study from a developing country performed in the elderly at a nursing home [16] which excluded patients with dementia or those who were taking anti-dementia drugs. A previous study [17] conducted on Intensive Care Unit patients incorporated 902 subjects and reported 100% polypharmacy with the average number of drugs per patient (prescription) was 11.6± 2.09. Another study from India reported inappropriate medication usage among the hospitalized elderly [11]. This however only studied the inappropriate medication use and its predictors in the elderly. Our study examined both, polypharmacy, the average number of drugs per elderly and the frequency of usage of PIM both in patients with dementias and those with mild cognitive impairment. To our knowledge therefore, this is the first study showing the prevalence of polypharmacy and the use of PIM in patients with mild cognitive impairment and dementias.

A review of the existing drug safety data indicates that adverse drug reactions (ADRs) are dependent upon the number of drugs taken by an elderly patient. Although we generally tend to consider the medications that patients are taking as prescribed in the hospitals or on an outpatient basis, but several patients may also be taking drugs of complementary and Alternative system of Medicine (CAM) concomitantly with the mainstream drugs. This may potentially contribute to ADRs. It has earlier been reported that a significant number of patients with Alzheimer's disease use CAM concomitantly with the mainstream drugs [18]. A large study of community dwelling elderly with dementia showed that polypharmacy increases the risk of functional decline [19]. All the drugs that we labeled as PIM were as per the modified Beers criteria, 2012 except beta blockers.

Ten patients in the present study were taking beta-blockers for hypertension and angina. Although beta-blockers do not impair cognition in normal subjects, but there is a possibility that central nervous system active beta-blockers could affect memory in patients with cognitive impairment [20]. Likewise, it has been suggested that beta-blocker use is a risk factor for dementia [21]. It has also been suggested that if suspicion of cognitive impairment due to beta-blockers develop, then, beta-blockers should be avoided.

A sizable number of patients (17%) were taking zolpidem in the present study. About 70% of the patients were taking high dose zolpidem (10mg) which is not recommended for use in the elderly. It has been suggested that careful selection of routinely prescribed drugs may be more important in cognitively impaired elderly [22]. Though several attempts are being made to reduce polypharmacy in the elderly, this continues to increase despite being a known factor contributing to morbidity and mortality [23].

Some of the previous studies have reported that the drugs having potential to cause worsening of cognitive decline are associated with higher risk of dementia in later life [24]. Likewise, it has been estimated that inappropriate prescription may be responsible for up to 20% cases of dementia [5]. Since cognitive impairment challenges individuals therefore the need to keep the number of medications to bare minimum cannot be overemphasized [24].

CONCLUSION

Although, present study has included patients with dementia and those with MCI, this study perhaps will hold good for other elderly as well in general. This is because, a large study found that there was no difference as to PIM use among those with or without dementia [25]. More so, our patients, for the current study have been chosen randomly. Use of fewer than 5 drugs and medication support in consultation with other healthcare professionals like clinical pharmacists and clinical pharmacologists can help in minimizing potentially inappropriate medications use [5]. A rational polypharmacy executed scientifically may however be useful [26]. Therefore, there is a need for more helpful and less harmful clinical strategies [27].

Conflict of interest: none

Authors' roles: Description of authors' roles: Vikas Dhikav conceptualized, collected and analyzed the data and carried out the whole study. Mansi helped in data collection and finalization of the manuscript. Arjun Singhal did editorial corrections and helped finalizing the manuscript for publication. KS Anand helped in diagnostic evaluation of patients and also oversaw the whole study.

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