



Original Research Article

Psychotropic Drug Utilization in Psychiatry Inpatients at Extremes of Age at a University Hospital in Southern India

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ABSTRACT

Background: Psychiatric disorders are fast emerging as a major group of disorders affecting the society. With a predominantly younger population, psychiatric morbidity in children in India is relatively high. Also, management of psychiatric illness in elderly is complicated by presence of comorbidities and attendant polypharmacy. The objective of our study was to determine the psychotropic drug utilization pattern in the extremes of age in a tertiary care facility in Southern India.

Method: Hospital records of psychiatry inpatients ≤ 18 years of age and ≥ 65 years of age admitted over a period of one year and two years respectively were studied. Drugs prescribed on hospital admission and on discharge were recorded.

Results: A total of 133 patients were studied of which 82 were children and the rest were elderly. Of the 82 pediatric patients, 59.8% were males. The mean age was 11.47 ± 5.09 years in males and 13.67 ± 4.09 years in females ($p=0.034$). Antianxiety drugs were the most commonly prescribed psychotropics followed by antipsychotics. Of the 51 elderly patients, 58.8% were males. The mean age was 73.67 ± 5.8 years in males and 68.57 ± 4.7 years in females ($p=0.001$). Antianxiety drugs were the most commonly prescribed psychotropics followed by antidepressants. Polypharmacy was less as compared to other similar studies.

Conclusion: A large number of patients in both the extremes of age received anxiolytics. No significant gender difference was seen with regard to polypharmacy. A larger study of psychotropic drug prescription taking into consideration the standard practice guidelines, both in the children and elderly patients, is necessary.

Keywords: Drug utilization, psychotropics, age, gender, polypharmacy.

INTRODUCTION

With the pace of today's modern lifestyle taking a toll on mental health, psychiatric disorders are fast emerging as a major group of disorders affecting the society. The World Health Organization

(WHO) estimates that mental and behavioral disorders account for about 12 percent of the global burden of diseases. ^[1] In our country the estimated prevalence range for psychiatric morbidity is between 9.5 to 102 per 1000 population. ^[2]

The estimated worldwide burden of psychiatric morbidity in children and adolescents is about 20%.^[3] This is a serious problem in India because more than 40% of our population is ≤ 18 years of age.^[4] Studies have shown a trend of increasing psychotropic drug prescription^[5,6] without a corresponding increase in clinical research to confirm the safety and efficacy of these drugs in the younger population. The clinical experience and the adult psychopharmacology data cannot completely substitute the need for well conducted clinical studies. The emergence of data which has questioned the safety of the selective serotonin reuptake inhibitors (SSRIs) in young people has highlighted the need for such research in children and adolescents.^[7] Considering the potential effects of psychotropic medications on physical growth and brain development in children, it is important to identify valid methods for detecting the possible drug-induced adverse events during an early or prolonged exposure to the drugs.^[8]

Psychotropic drug use in the elderly pose a different set of challenges. They are a common cause for potentially preventable adverse events such as delirium, depression and falls. The effect of psychotropic drugs is compounded by the presence of comorbidities and attendant polypharmacy. A high prevalence of psychotropic medication use in frail elderly people is well documented.^[9-12] Any intervention to increase the effective use of psychotropics in extremes of age while limiting their potential adverse effects or improper use would first require the identification of potential target areas or situations. Hence, the objective of this study was to determine the drug utilization pattern in the children and the elderly psychiatry inpatients which would be the preliminary step to identify areas for further research.

MATERIALS AND METHODS

This was a retrospective, descriptive, case record study, conducted at a university hospital in Southern India. All psychiatric inpatients aged ≤ 18 years admitted from 1st January 2013 to 31st December 2013 and those aged ≥ 65 years admitted over a two year period from January 2012 to December 2013 were included in the study.

Approval from the institutional ethics committee was obtained before initiation of the study. The case record files were retrieved from the medical records department based on the ICD-10 disease coding (International Statistical Classification of Disease and Related Health Problems, Tenth revision, ICD-10, F00-F99). The demographic details were recorded. Total admissions, the medication status (on or off medications) of all patients at admission and at discharge was ascertained. If a patient was readmitted on the same medication, this was considered a separate trial. Drug classes were delineated as follows – antidepressants, antipsychotics, mood stabilizers, stimulants, anxiolytics and hypnotics. Polypharmacy was defined as prescription of more than one psychotropic medication. Categorical data was analyzed using the chi-square statistic. Student's t-test was used for continuous variables with significance set at $p < 0.05$. Proportionate use of each drug class with regard to age and gender was ascertained in order to evaluate whether usage was differentially distributed across patient populations.

RESULTS

A total of 133 patients were recruited of which 82 were in the pediatric age group and the rest were above 65 years of age.

Demographic details:

Of the 82 pediatric inpatients, 59.8% were males. The mean age was 11.47 ± 5.09 years in males and 13.67 ± 4.09 years in females ($p=0.034$).

Of the 51 elderly inpatients studied, 58.8% were males. The mean age at hospital admission was 73.67 ± 5.79 years in males and 68.57 ± 4.69 years in females with

males being significantly older at the time of presentation ($p=0.001$).

Based on ICD-10, the common diagnosis in the study sample is showed in Table-1.

Table 1: Common psychiatric diagnoses in the study sample based on ICD-10

Geriatric Age group (≥ 65 years of age), n=51	
Primary diagnosis	No. of cases (in percentage)
F03.0: Unspecified dementia	29.4
F31.0: Bipolar affective disorder	7.8
F01.1: Multi-infarct dementia	5.9
F34.1: Dysthymia	5.9
F43.2: Adjustment disorders	5.9
Pediatric age group (≤ 18 years of age), n=82	
Primary diagnosis	No. of cases (in percentage)
F43.2: Adjustment disorders	13.4
F41.9: Anxiety disorder, unspecified	8.5
F93.9: Childhood emotional disorder, unspecified	7.3
F70.0: Mild mental retardation	6.1
F44.4: Dissociative motor disorders	4.9
F45.3: Somatoform autonomic dysfunction	4.9

Drug use & polypharmacy:

Pediatric study sample:

Of the 82 patients, 2.44% were on psychotropic drugs before hospital admission, 45.12% received medications on hospital admission and 43.9% on the patients were discharged on medications. A larger percentage of males were on psychotropic medications on discharge and the difference was statistically significant ($p=0.0406$). There was no significant changeover of the drug classes between the admission and the discharge. Also, there was no significant difference between the prescription rates of a drug class on admission and discharge.

The use of various groups of psychotropic drugs during inpatient treatment is shown in Figure 1A. No mood stabilizers were prescribed in the entire study sample. Psychotropic drug utilization on hospital discharge did not differ significantly. Lorazepam was the most frequently prescribed drug with 22% of the study sample receiving the drug. As a group, antianxiety drugs were the most commonly prescribed drugs accounting to 44.78% (30/67) of the total number of drugs

prescribed. Olanzapine was the commonest antipsychotic to be prescribed with atypical antipsychotics constituting 85%. Escitalopram was the commonest antidepressant to be used with selective serotonin reuptake inhibitors (SSRIs) constituting 73.33% of the antidepressants prescribed. Atomoxetine was the only drug for attention deficit disorder to be prescribed in two patients. Use of antidepressants (33.3% versus 8.2%, $p=0.004$), antipsychotics (45.5% versus 10.2%, $p<0.001$) and anxiolytics (48.5% versus 26.5%, $p=0.06$) was significantly more common in females.

Of the 37 inpatients who received medications, 29.73 patients received two psychotropic drugs while 27.03% received three drugs. Polypharmacy was significantly more common in females (78.9% versus 33.3%, $p=0.005$). The commonest drug combination prescribed was an antipsychotic with an anxiolytic.

Geriatric study sample:

Of the 51 patients, 31.37% were on psychotropic drugs before hospital admission, 76.47% received medications on hospital admission and 76.47% on the

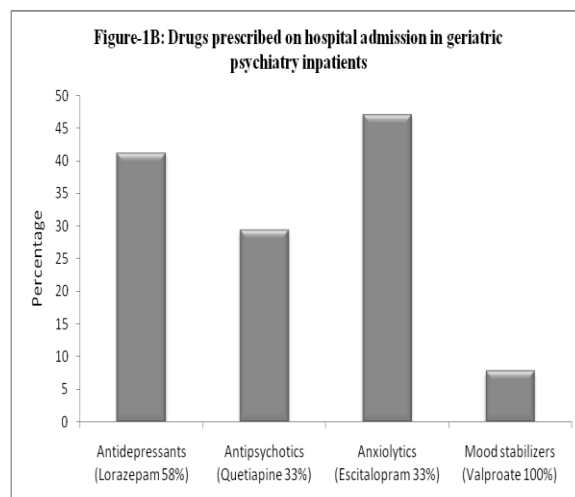
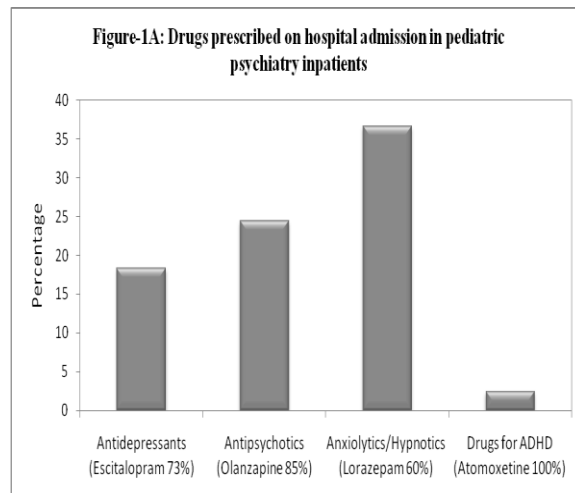
patients were discharged on medications. There was no significant difference in psychotropic drug utilization between the genders. As observed in the pediatric age group, there was no significant changeover of the drug classes between the admission and the discharge and also, there was no significant difference between the prescription rates of a drug class on admission and discharge.

The drug utilization percentage of various groups of psychotropic drugs is shown in Figure-1B. The most commonly prescribed drugs among antipsychotics, antidepressants, anxiolytics/hypnotics, mood stabilizers were quetiapine (33.33%), escitalopram (33.33%), lorazepam (58.33%), and valproate (100%) respectively. Anxiolytics were the most common psychotropic drugs prescribed. All the antipsychotics prescribed belonged to the atypical group. Valproate was the only mood stabilizer that was prescribed.

Of the 39 inpatients on psychotropic medication, 24 (61.54%) received 2 or more drugs. Among the 51 patients, 33.3% were prescribed two psychotropic drugs, 7.8% received three drugs, 2% received four drugs and 3.9% received five drugs. No significant gender difference was seen with regard to psychotropic polypharmacy. The most common drug combination to be prescribed was an antidepressant with an anxiolytic.

Figure 1: Psychotropic drugs prescribed on hospital admission

X axis denotes the psychotropic drug groups. Among each group, the most commonly prescribed drug is mentioned within brackets. Y axis denotes the percentage of study sample who received the psychotropic drug(s).



DISCUSSION

This study examined the patterns of psychotropic medication utilization in 82 pediatric inpatients who were admitted over a period of one year, and 51 patients above 65 years of age who were admitted over a two-year period in the psychiatry ward of a tertiary care hospital. In the pediatric age group, there was significant difference in the age of presentation between genders, with female patients being of older age. In the geriatric age group, the mean age at hospital admission was significantly more in males. 59.8% of the total pediatric admissions comprised of males as compared to a range of 44.3% to 54.6% reported in other studies. [13-15] 58.8% of the elderly psychiatry

inpatients were males. Data from other studies show that female patient population was higher in the elderly group, whereas the percentage in our study was comparatively less. [16]

The pattern of psychiatric morbidity seen in children in our study was consistent with that of similar studies which were done in India. [17] As found by Dean and coworkers, the disorders of psychological development and behavioral disorders were more common in males, while neurotic and somatoform disorders were more common in females. [13] According to a study done among the urban geriatric population, common psychiatric diagnoses included depressive disorders, dementia, generalized anxiety disorder, alcohol dependence and bipolar disorder. [18] In a study done in a rural setting in India, the overall prevalence of psychiatric morbidity in rural older adults was found to be 23.7%. The most common condition observed was mood (affective) disorder, followed by mild cognitive impairment, mental and behavioral disorders due to substance use and dementia including Alzheimer's disease and vascular dementia. [19]

In children, 45.12% of the total sample received one or more psychotropic medication. In similar studies, these values ranged from 49% in residential psychiatry facilities to 71.3% in inpatient units. [13,20] We found that there was no significant change in the number or class of the drugs which were used on hospital admission and discharge, and this was seen in the geriatric population as well. Earlier studies had shown a significant decrease in the use of psychotropic drugs from the time of the hospital admission to the discharge, but this trend was not observed in this study. [13,20] The most common group of drugs that was prescribed in both the pediatric and geriatric population was the anxiolytics, followed by the antipsychotic drugs in children and the

antidepressant drugs in the elderly. The prescription rates of various groups of drugs differed in earlier studies done in pediatric population. In the study which was done by Dean *et al*, the percentage use of antidepressants was 56.6%, that of antipsychotics was 32.8%, that of anxiolytics/hypnotics was 13.9%, that of stimulants was 13.9%, and that of mood stabilizers was 3.3%. [13] In another study done in Belgrade, the most frequently prescribed medication groups were antipsychotics(45.9%) of which risperidone was the most common, followed by antidepressants (17.2%), mood stabilizers (16.1%), benzodiazepines (14.4%), and other psychotropic drugs (6.4%). Risperidone and chlorpromazine together accounted for more than three quarters of prescribed antipsychotics. [21] A similar finding of risperidone being the most frequently prescribed drug in adolescent population was reported from another study based in the Netherlands. [22]

The percentage use of the drug classes in our study in the pediatric population was as follows: anxiolytics - 36.56%, anti-psychotics- 24.39%, antidepressants- 18.29%, stimulants/non-stimulants - 2.44%, and mood stabilizers - 0. However, the disease presentation patterns were not similar and hence there was a difference in the drug utilization rates. The percentage use of the drug classes in our study in the geriatric population was as follows: anxiolytics - 47.1%, antidepressants - 41.2%, antipsychotics -29.4%, mood stabilizers - 7.8%.

A salient finding in this study was the significant higher use of anxiolytics/hypnotics as compared to that in the earlier studies done in pediatric population. They were frequently indicated in cases with multiple diagnoses which involved neurotic, stress related and somatoform disorders, mood disorders and

behavioral and emotional disorders. The most commonly used anxiolytic was lorazepam, a short acting benzodiazepine, among both the study populations, similar to that reported by Rancourt *et al.* [23]

Antidepressants were the second most common group of drugs prescribed in the elderly, and the third most common group in the pediatric population; the pattern being similar to earlier studies where antidepressants were one of the most common group of drugs prescribed. [9] Selective serotonin reuptake inhibitors (SSRI) were the most commonly prescribed group among the antidepressants, among which escitalopram was the most common drug. Escitalopram has a favorable pharmacokinetic profile, including fewer pharmacokinetic drug interactions than other SSRIs. [24] This could be the reason for the preference over other available antidepressants. However, SSRI overdose may still lead to serotonin syndrome, QTc prolongation, seizures, coma and death. [25] This is more likely in cases of intentional over dosage or multiple drug intakes. [26] Antipsychotics were the second most common group of drugs prescribed in the pediatric study population, and the third most common group in the geriatric study group. Among them, the atypical antipsychotics were more commonly used, the use of which for both psychotic and nonpsychotic disorders, such as aggression in the youth, is increasing. [27] There is insufficient evidence regarding the potential, negative, long-term consequences of weight gain and the endocrinological changes which are associated with most of the atypical antipsychotics. [28,29] The popularity of the atypical anti-psychotics is mostly due to the lower incidence of the extrapyramidal side effects associated with their use. The side effects however, including extrapyramidal effects, may occur more frequently in younger patients as compared

to the adults. [30] Therefore, detailed larger studies are needed to confirm these observations.

The use of drugs for ADHD was much lower as compared to that in other reports and atomoxetine was the only drug to be prescribed. All the prescriptions in our study were written by psychiatrists. The pattern of the stimulant prescription might vary when prescriptions from pediatricians and general practitioners are taken into consideration. [14,31] With regard to the use of mood stabilizers in the geriatric study population, valproate was the only drug prescribed.

Polypharmacy:

Polypharmacy in our study among the elderly was less than that reported in other studies. [9,23,32] During hospital stay, 7.8%, 33.3% and 29.4% of patients received three, two and one psychotropic drug respectively. 23.53% patients did not receive any psychotropic medication. High overall use of psychotropics in hospitalized patients has been seen in other studies as well. There was no significant change in the overall percentage of polypharmacy on hospital discharge. The high use of anxiolytics at the time of discharge may be a cause for concern considering its CNS depressant effect and interaction with other psychotropic drugs. No significant difference in polypharmacy was seen with regard to gender although some studies have reported a higher drug use in elderly females. [33,34]

Among the pediatric study population, 26.83% of the patients were started on 2 or more psychotropic drugs simultaneously. An earlier study done reported that at discharge 23% of youth were given 3 or more medications from different drug classes, and it was also observed that the rates of hospital re-admission were higher with polypharmacy. [35] In a study done among child and

adolescent population across a twelve-year period, rates of polypharmacy rose from 14.3%(1996-1999) to 20.2% (2004-2007). ADHD medications, antidepressants, and antipsychotics were seen to be prescribed more often than mood stabilisers. Specifically, the co-prescription of ADHD medications with antipsychotics, and antidepressants with antipsychotics was found to be significant. [36]

Our study has certain limitations. The sample size was small to derive any generalized conclusions and the data is limited to a single tertiary care center. Also, since it was a descriptive study, no attempt was made to determine the rationality of the prescription. This would require studying the drug utilization in comparison to the practice guidelines for specific disorders. Our study intended to present the drug utilization data in the inpatients at the extremes of age in general.

CONCLUSION

In our study, males accounted for a larger percentage of psychiatry inpatient admissions in both the extremes of age. While female patients presented at a significantly older age in the pediatric population, the males presented at an older age among the elderly. The most notable feature with regard to psychotropic drug use was the high percentage of prescription of anxiolytics in both the extremes of age, the use of which may or may not be justified. No significant gender difference was seen with regard to polypharmacy. Also, no significant difference in the drug use was seen on hospital admission and discharge. A larger study of psychotropic drug prescription taking into consideration the standard practice guidelines, particularly with regard to anxiolytic use, both in the children and elderly patients is necessary.

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