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Drug utilization patterns of Geriatric patients admitted in the Medicine Department of a Tertiary Care Hospital

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Abstract

Drug utilization studies on geriatric population are an area of research where the data available is very limited and this population is generally neglected. This study was done to assess the usage of essential medicines and to identify the diseases common among this population. It was a cross sectional, unicentric observational drug utilization study with admitted patients in medicine ward as study population. The sample size was 111 patients. The case sheets of the patients were verified after obtaining written informed consent and the drugs prescribed were analyzed. The majority of patients were found to be in the age group of 60 to 70 years (76%).It was noticed that males were more (63%) compared to females. The drugs prescribed were categorized and drugs used for respiratory disorders were used more commonly of which Deriphylline was prescribed for almost half of the patients in this study group. The Average number of drugs per prescription was 9.4±0.31 (SEM). Average drug cost per admission was Rs.981.93±87.49 (SEM). Brand names were used (74%) in preference to generic names. Among the drugs prescribed 78% were from the national list of essential medicines (NLEM) and only 58% were from the WHO Essential Medicines List. This study revealed the chronic nature of diseases affecting the geriatric population with an increased incidence of respiratory diseases and rightly the drug deriphyllin was the most common drug utilized. The pattern of drug prescription also shows a trend towards polypharmacy (≥ 5 drugs) which has to be viewed with caution given the pharmacokinetic changes in the elderly. These studies can help to promote rational use of drugs.

Key-Words: Drug utilization, Geriatric, Essential drug list, Prescription

Introduction

India is ageing fast and currently the Geriatric population is about 7 percent of the total population.(1) Drug utilization studies are exploratory tools to ascertain the role of drugs in the society. Geriatric medicine is the branch of gerontology which deals with clinical or medical aspect of gerontology. Generally people in India once they become aged feel dejected and insecure. The cut off age to be called geriatric is 60 years and above.(1) The changes that occur with ageing are:

Changes in the GI absorption.

Absorption from the skin is reduced in the elderly.

Ageing leads to shrinkage of liver. So, the hepatic blood flow is reduced.

As the body fat increases in proportion to water and muscle, fat soluble drugs undergo slower elimination.

Renal function is impaired, glomerular filtration rate is reduced.

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Material and Methods

Ethical issues

The study protocol and informed consent form (both in the vernacular language-tamil as well as in English) were submitted to the institutional ethics committee and the study commenced only after being approved.

Written informed consent was taken from each participant. Illiterate individuals gave their left thumb impression instead of signature in the presence of an appropriate witness.

Patient selection criteria

The subjects who willingly participated were enrolled. Patients were observed daily from day one of admission till the day of discharge and the demographic and treatment details were recorded in a separate record sheet. Patients aged sixty years and above were included in the study. Patients who went away against medical advice were also excluded. Patients unable to communicate, i.e., patients on ventilators or seriously ill patients requiring ICU

admission as well as those unwilling to participate were excluded from the study.

Study area

Female and male medical wards of Sri Manakula Vinayagar Medical College Hospital, Madagadipet, Pondicherry.

Study design

Cross sectional, unicentric, observational study.

Study period

From May 2011 to July 2011.

Study population

The present study was conducted on 111 geriatric patients who were admitted in the male and female medical wards.

Study methodology

A cross sectional, unicentric study was conducted in the wards of the medicine department of an urban, tertiary care, medical college hospital. The case sheets of the patients who were admitted in the medical wards of our hospital was verified and the drug utilized by the patients were enrolled and analysed for its cost effectiveness, adverse effects and drug interactions.

The information was collected personally by the investigator from the site of study. The information was collected daily and analysed at the end of study.

Drug utilization study seeks to monitor and evaluate the drugs prescribed with the aims of making medical care rational and cost effective.

Those aged 60 years or more were considered as belonging to geriatric age group. The number of drugs prescribed in every prescription was taken into account to calculate the incidence of polypharmacy.

Prescription data are useful for determining some of the quality indicators of drug use recommended by W.H.O.

These include:

- Average number of drugs per prescription.
- Percentage of drugs prescribed by generic name.
- Percentage of drugs prescribed from essential drugs list.
- Average drug cost per admission.

Statistical analysis

The statistical analysis was done by using the excel software package.

Results and Discussion

Gender distribution (fig. 1): Out of the 111 prescriptions 70 (63.1%) were males and 41 (36.9%) were females. The patients were not equally distributed (i.e.) in 60 to 70 years (75.7%), 71 to 80 years (16.2%) and more than 80 years (8.1%) (fig.2). The average number of drugs per prescription was 9.4±0.31 (SEM). Percentage of drugs prescribed with brand names was 73.7% and the percentage of drugs prescribed with generic names was 26.3 % (fig. 3). Percentage of drugs used from WHO essential drug list was 58.4%. The percentage of drugs from the national list of essential medicine (NLEM) was 78.5%. (fig.4). Average drug cost per admission was Rs.981.93±87.49 (SEM). Average drug cost per male was Rs.985±106 (SEM) and average drug cost per female was Rs.976±155 (SEM). (fig.5)

Duration of hospitalisation (fig.6): The distributions of hospitalisation among the patients were as follows less than 6 days: 30 (27%) patients, 6 to 10 days: 54 (48.6%) patients, 11 to 15 days: 24 (13.5%) patients, 16 to 20 days: 1 (0.9%) patients, More than 20 days: 2 (1.8%) patients

Most common drug category wise (fig.7):

Category	Route of Administration	
	Oral Formulation (%)	Parenteral (%)
Respiratory system	Deriphylline (20)	Deriphylline (20)
Antipyretics	Paracetamol (18)	Paracetamol (05)
GIT	Ranitidine (13)	Ranitidine (19)
CVS	Amlodipine (13)	Dopamine (02)
Vitamins &Minerals	FST(10)	B12 (09)
Renal	Furosemide (08)	Furosemide (12)
Endocrine	Metformin (07)	Dexamethasone (19)
Antimicrobials	Doxycycline (06)	Ceftriaxone(14)
CNS	Alprazolam (05)	

The geriatric population is increasing and this population is vulnerable to many diseases and drug-related problems. In India only very limited documented data are available on drug utilization in this population. We undertook this study in order to understand the pattern of drug use and related issues in geriatric patients. More males (63.1%) were admitted than females (36.9%). Hence the majority of drug utilization was by males. The majority of these patients had retired from work and hence were dependent on family members for income and support. Average number of drugs per prescription is an important index of the scope for review and intervention in prescribing practices. It is preferable to keep the mean number of

drugs per prescription as minimum as possible. This will help to avoid the drug-drug interactions, development of bacterial resistance and will decrease hospital cost. In this study average number of drugs per prescription is 9.5 which is 4 times more than other study.

The morbidity pattern in these patients was different to what is commonly found in Indian geriatric patients. Cardiovascular diseases are usually common in this age group. In these study respiratory diseases like bronchial asthma, chronic bronchitis and COPD were more common and drugs used for these diseases were more commonly used. In western countries psychiatric diseases were more common which not the case here was. This low prevalence of psychiatric conditions in our study could be due to poor awareness regarding psychiatric illness among patients and family members. In the Indian setting the elderly people live with other family members and this support prevents psychiatric problems. The presence of co morbidities was also seen which leads to multiple and complex drug treatment and thus the chances of ADRs and drug interactions are greater.

The average number of drugs prescribed per prescription was 9.4±0.31 (SEM) which was very high and falls under polypharmacy. This could be due to the type of patients visiting the tertiary care hospital and the tendency for co morbidities in the elderly. Considering the adverse outcomes associated with polypharmacy, including adverse drug events, drug–drug interactions, increased cost of medications, increased risk of hospitalization, non-compliance, and various medication errors, polypharmacy must be viewed seriously and steps must be taken to reduce it. Only (26.34%) of drugs were prescribed by their generic names. These findings show that there is a need to encourage prescribing by generic names, particularly in hospitals attached to medical colleges. Medical students are taught only the generic names of drugs in pharmacology and generic prescribing is emphasized in teaching hospitals. The trend of using brand names has been popularized by marketing done by pharmaceutical companies and due to lack of awareness in the medical fraternity in India. Commitment to prescribing drugs by generic names on the part of the doctor, and the political will to enforce drug production and prescribing only by generic names on the part of legislative and administrative bodies can certainly lead to decrease in irrational prescribing and increase in availability of essential drugs. Prescriptions using brand names was higher (73.69%). The cost was not very high given the duration of hospitalization and the people who were prescribed injections have showed higher cost than those prescribed tablets only.

Most common drugs:

Most common oral formulation	Most common parenteral formulation
Tab. Deriphylline	Inj. Deriphylline
Tab. Paracetamol	Inj. Dexamethasone & Inj. Ranitidine
Tab. Ranitidine	Inj. Ceftriaxone

Among the most common drugs administered through various routes, Tab. Deriphyllin and Inj. Deriphylline were found to top the list. This again points to the prevalence of respiratory diseases in geriatric population in our hospital.Tab. Paracetamol, an antipyretic and Tab. Ranitidine, an H_2 blocker for peptic ulcer were the other oral drugs commonly used. Inj.Dexamethasone and Inj.Ranitidine were the other commonly used injections. For type 2 diabetes mellitus the most commonly used oral hypoglycemic agent was metformin which is a biguanide. This is in contrast to other two studies in which sulfonylureas were commonly used in type 2 diabetes mellitus in geriatric patients[10,11.]

Conclusion

More males were admitted than females. Hence majority of drug utilization was by males. Most of the patients needed prolonged treatment (6-10 days) and this indicates the chronic nature of the diseases in this age group. In this study Deriphyllin is the most commonly used drug and this implies respiratory diseases are common in the aged patients of our hospital. So this study has opened up the pandora's box on the geriatric population and would inspire others to do further research in this area.

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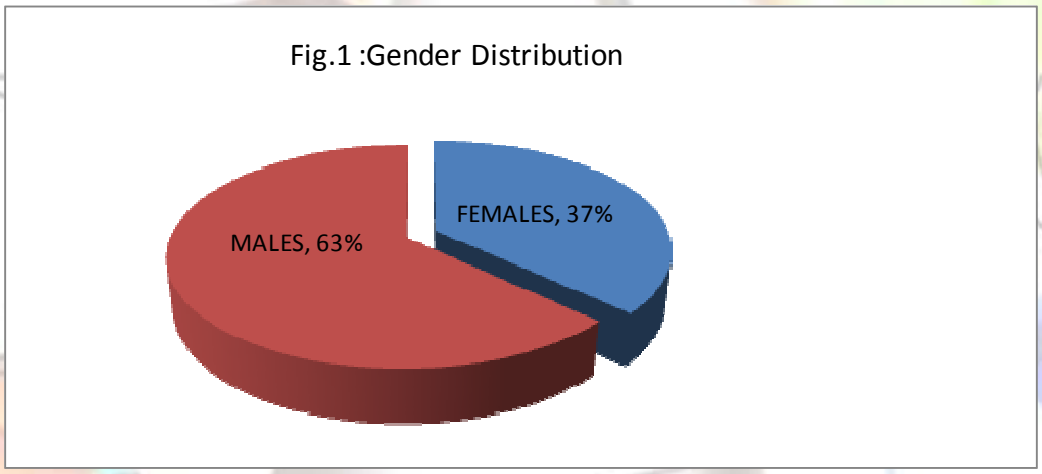
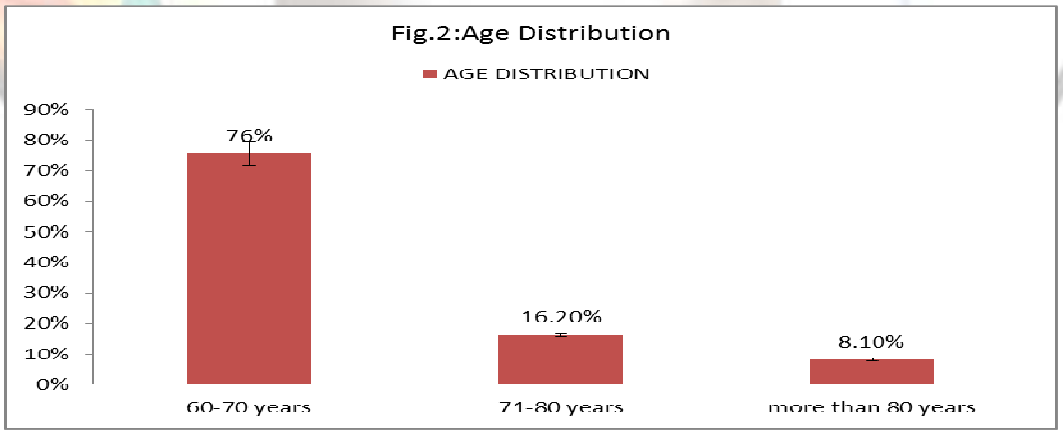




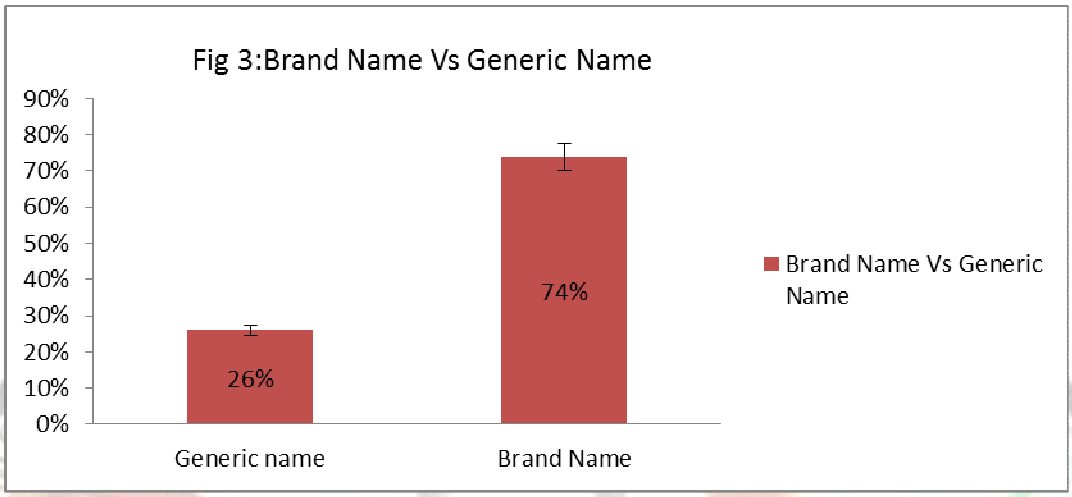


Fig 3:Brand Name Vs Generic Name
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
26%
74%
Generic name
Brand Name
Brand Name Vs Generic Name

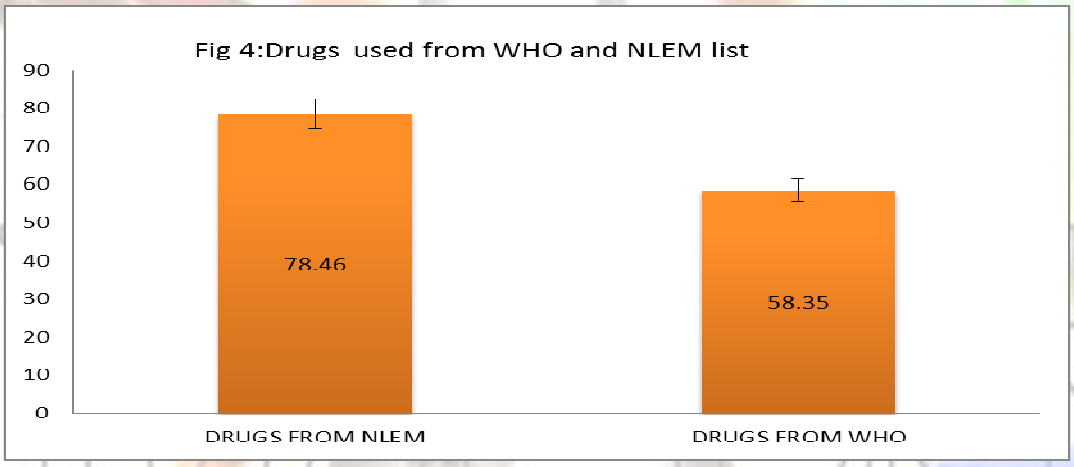


Fig 4:Drugs used from WHO and NLEM list
90
80
70
60
50
40
30
20
10
0
78.46
58.35
DRUGS FROM NLEM
DRUGS FROM WHO

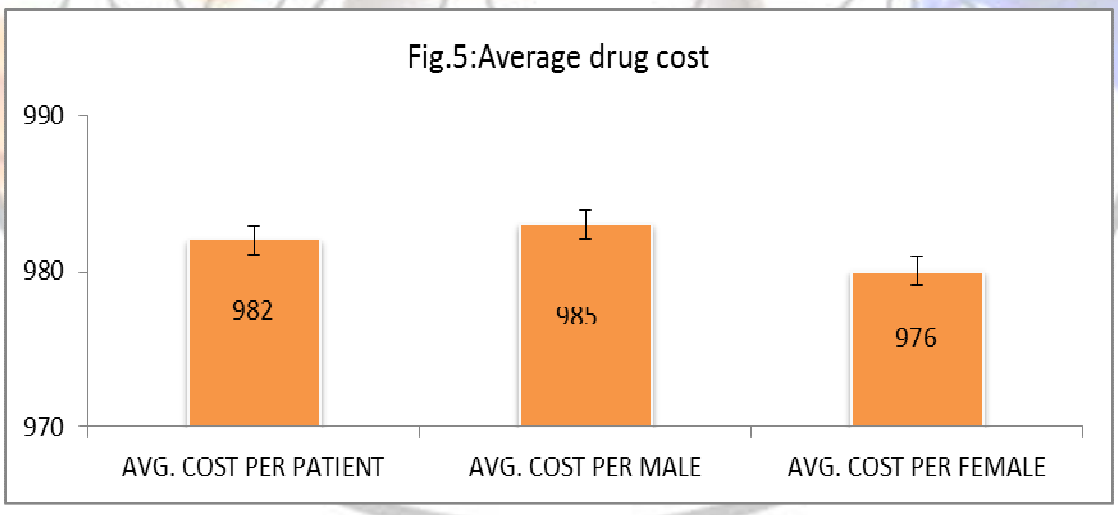


Fig.5:Average drug cost
990
980
970
982
985
976
AVG. COST PER PATIENT
AVG. COST PER MALE
AVG. COST PER FEMALE

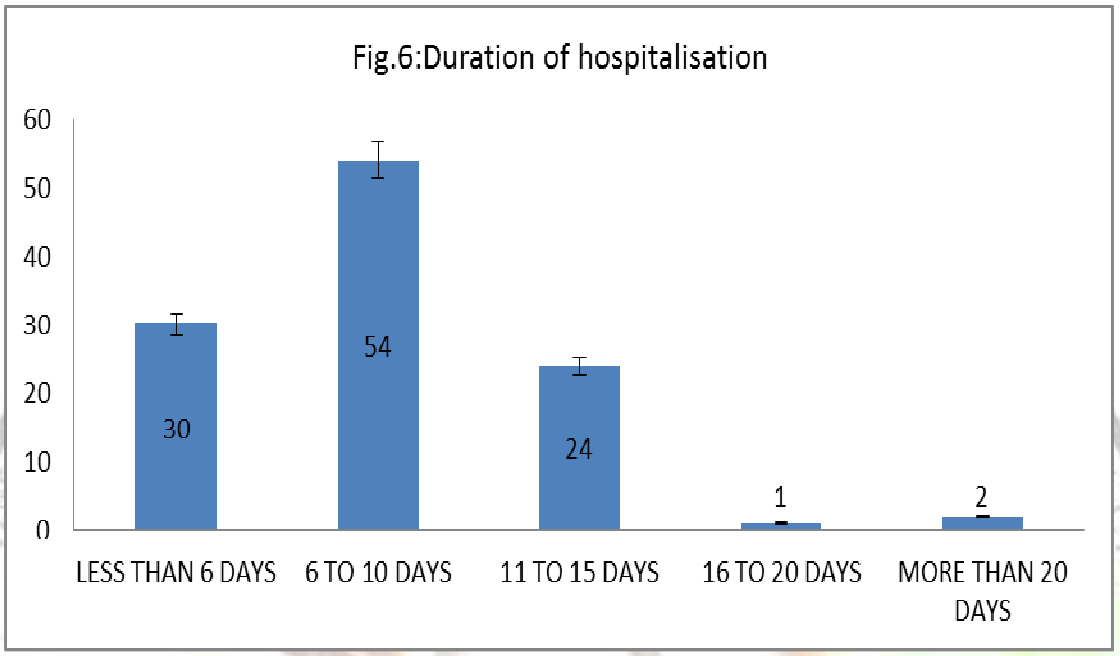
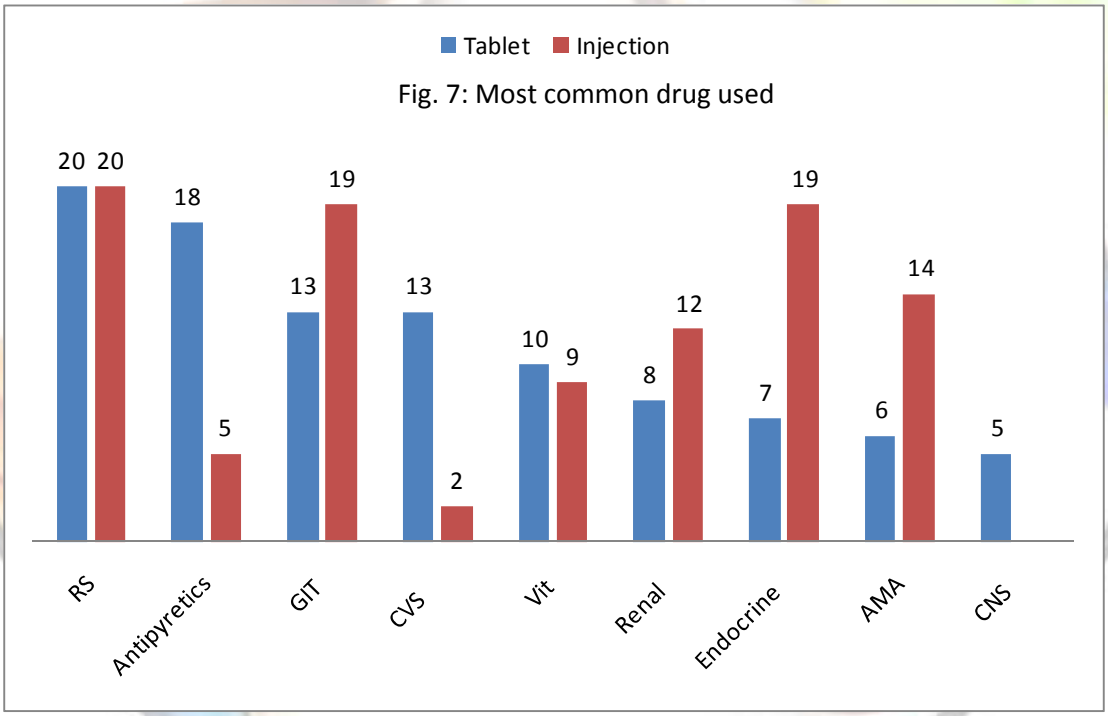


Fig.6:Duration of hospitalisation
60
50
40
30
20
10
0
30
54
24
1
2
LESS THAN 6 DAYS
6 TO 10 DAYS
11 TO 15 DAYS
16 TO 20 DAYS
MORE THAN 20 DAYS


Tablet
Injection
Fig. 7: Most common drug used
20 20
18
5
13
19
13
2
10
9
8
12
7
19
6
14
5
RS
Antipyretics
GIT
CVS
Vit
Renal
Endocrine
AMA
CNS