A PILOT STUDY TO DETERMINE THE COST OF PHARMACEUTICAL DRUG TREATMENT FOR CHRONIC CONDITIONS PRESCRIBED IN RELATION TO PATIENTS' AGE

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Abstract

Objective To determine the age distribution of patients and the total drug cost. To establish the average cost per age group and identify factors that may influence cost.

Method A pilot study was conducted by selecting by convenience sampling a number of patients over 18 years who were registered in the Pharmacy of Your Choice scheme with a community pharmacy where the study was carried out. For each patient, type, frequency and cost of medication supplied were identified from treatment cards and from Government Health Procurement Services (GHPS).

Key findings Data was collected for 491 patients (aged between18-98 years) were 272 (55%) were females and 10% (n = 47) were institutionalised. Eight percent (n=395) were prescribed drugs for cardiovascular diseases which constituted 50% of the total drug expenditure. Daily cost per patient was one euro. Pearson correlation value ($p<0.05$) revealed a significant relationship between the increase in cost, unit doses and number of diseases with increasing age, between gender and different settings. Gender variation between drug categories was not significant ($p>0.05$).

Conclusions Cost of drug treatment is vital information that financing providers and policy makers require for the allocation of budgets. Findings suggest that populations are ageing, cost increases with age and that gender and setting influence the treatment being provided.

Keywords Cost, drug utilisation, ageing

Introduction

The cost of treatment is a prominent topic discussed all over the world. In view of population ageing[1], strategies that sustain health, such as social security funds, total or partial reimbursement and co-payments, adopted in various countries are increasing the pressures on the financing providers which include governments and insurances.

Availability and price of drug together with the age and socio-economic status of the patient influence the drug treatment prescribed and its benefit. The larger proportion of the population are elderly, who in general are dependent on social security funds, requiring long-term treatment for a number of chronic conditions.[2]

Locally, the state provides drug treatment for chronic conditions free of charge.[3] The ever increasing number of eligible patients requiring treatment impacts the healthcare costs and makes review of drug treatment and cost vital. The aim of the study was to determine the cost of chronic drug treatment in relation to increasing age.

Method

STUDY DESIGN

This was a pilot study performed on a sample of patients (491) aged 18 years and over, selected by convenience sampling, that collect their free medication supplied by the government from a pharmacy in Malta which is part of the POYC scheme. The study was approved by the Research Ethics Committee of the University of Malta.

The age and gender of all the patients who took part in the study were recorded on a data collection sheet. Patients were assigned a code, ensuring confidentiality. Patient treatment cards were reviewed and the four week drug treatments were documented. The patient setting was also noted. The British National Formulary[4] was used as a guide to the main drug classes. The prices of all tenders procured by the government for each drug identified was supplied by the Director of GHPS of Malta[5]. All prices were quoted in the Euro currency. The average unit price of each item was calculated.

DATA HANDLING AND STATISTICAL ANALYSIS

A data collection sheet was used to extract required data. The patients were ranked in ascending order according to age and were segmented in 5 year intervals. The data was imported into a MySQL database which facilitated the extraction of any required information. The age distribution of the sample population was estimated and was categorised by gender.

Statistical analysis was carried out using SPSS PASW version 17. Descriptive statistics on the population characteristics were performed. ANOVA tests were used to compare the means of cost, unit doses and number of different drug categories between age groups. Chi-squared tests of association were used to compare the prevalence between men and women and between settings.

Results

PATIENT CHARACTERISTICS

A total of 491 patients aged between 18 and 98 years were recruited in the study. The mean age was 65.9 years (SD = ±14.9), the mode 65 years and median age 66 years. The 60-64 years age group had the highest number of patients (n=75) followed by that of 65-69 years (n=71) (Figure 1). The gender distribution was 45% (n=219) males and 55% (272) females. The setting for the patients was 10% (n=47) were institutionalised and had a mean age of 83 years (range 58–98 years) while those living in the community had a mean age of 64 (range 18 -98 years).

DRUG CATEGORIES

Fifteen drug categories were identified. Drugs used for the cardiovascular system (CVS) constituted the largest proportion of prescriptions. Eighty percent of patients (n=395) consumed at least one type of CVS drug which accounted for the observed 50% of the total drug expenditure for the whole sample. Drugs used for the central nervous system (CNS) and the endocrine system (END sys.) constituted 18% and 11% of the total expenditure respectively. The daily cost per patient was 74c for CNS drugs and 64c for CVS drugs (Figure 2).

TREATMENT COST

The daily total cost for the drugs provided to the whole sample population amounted to €491.43c, which is approximately equivalent to €1 per patient.

Figures 3 and 4 show how the average and total cost of drug treatment vary with increasing age by both genders and settings of the patient. The average daily cost and unit doses consumed and the number of diseases suffered by patients over 65 years was higher than for those under 65 years. (€1.18, 11 doses and 10 diseases as opposed to €0.88c, 9 and 5 respectively). Pearson correlation coefficient (0) revealed a significant difference between age, gender and setting ($P<0.05$). Differences ($P<0.05$) between the different drug categories prescribed in terms of cost, unit doses and number of patients suffering from a particular disease for patients living in nursing homes were observed to be significantly higher ($p<0.05$). Differences observed between gender were not significant ($p>0.05$).

Discussion

The cost of pharmaceutical drug treatment reflects a fraction of the total treatment cost. This study showed that the direct cost posed by the pharmaceutical drug treatment is dependent on the price of the procured drug product, the units consumed by each patient, the duration of treatment, the number of different drugs prescribed, and the total number of patients taking the drug/s. Other factors such as the age and gender of the patient were found to influence the overall cost.

Findings were consistent to data obtained in other studies. In a Dutch study conducted in 2002, the health care costs were observed to increase with increasing age and showed higher values for women both for acute and long term care.[6] Furthermore, a retrospective case-control study carried out in the UK, revealed that the cost of therapeutic drugs for patients living in nursing homes was more than double when compared with those of the community.[7] The age distribution of the patients in this study is consistent with population age distribution observed nationally and worldwide.

The observed high cost in the older age groups could be explained by the prescription of more expensive treatment. Studies revealed that social class appears to relate to polypharmacy and use of more CNS drugs.[8] Higher costs imposed by the female gender could be explained by the fact that they are more in number and have longer life expectancy; they tend to consume higher quantities of drugs and tend to suffer from more conditions such as osteoarthritis. The number of different diseases increases with age.

Review of drug treatment prescribed shows disease prevalence to be similar to that in European countries.[9] As reported in previous studies the occurrence of certain diseases such as CVS and CNS, is age dependent whereas, conditions such as asthma tend to be more controlled with increasing age.[10] The Eurofamcare report for Malta provides information on the number of institutionalised persons till 2004.[11] A large proportion of the elderly are now making use of these facilities due to increased morbidities and demands on care. The higher costs imposed by instituitionalised patients could be explained by the fact that, in most instances, medication is provided under supervision while patients living in the community may skip or refuse to take their medication.

The replacement of old drugs with new, more effective, better quality drugs could have contributed to the increased costs observed. Pharmaco-economic studies are important tools that help to select the most economically feasible and medically appropriate drug treatments. The search by governments and health insurers for cheaper therapeutic alternatives underlines the importance of generic medicines.[12]

Results obtained can be extrapolated for the whole population and can help determine the total yearly cost for all the patients and hence allocate the required resources. Knowledge on the number of patients who are eligible for drug treatment and their characteristics is vital and can serve multiple purposes. Documentation of drug treatment helps to spot trends in prescribing, unnecessary drug use and polypharmacy.[13,14] Drug review might suggest that certain medication is prescribed to overcome adverse effects imposed by other drug treatment taken concurrently. Elderly patients are more likely to experience side effects than their younger counterparts due to age-related changes in pharmacodynamic and pharmacokinetics. Inappropriate prescribing can be the result of restrictive government drug formularies and lack of consultation with pharmacists.

Conclusion

In view of population ageing, long-term benefits towards improved quality of life and cost savings in terms of decreased acute episodes and hospitalisation should be the objectives of policy makers when designing protocols and procuring drugs to be included in formularies. Availability of cheaper, good quality generics help minimise the overall cost. The identification of factors influencing the total cost and establishment of the average drug treatment cost per patient are essential tools that enable policy makers to allocate the required resources.

"Cost of drug treatment is vital information that financing providers and policy makers require for the allocation of budgets"

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"LONG-TERM BENEFITS TOWARDS IMPROVED QUALITY OF LIFE AND COST SAVINGS IN TERMS OF DECREASED ACUTE EPISODES AND HOSPITALISATION SHOULD BE THE OBJECTIVES OF POLICY MAKERS"

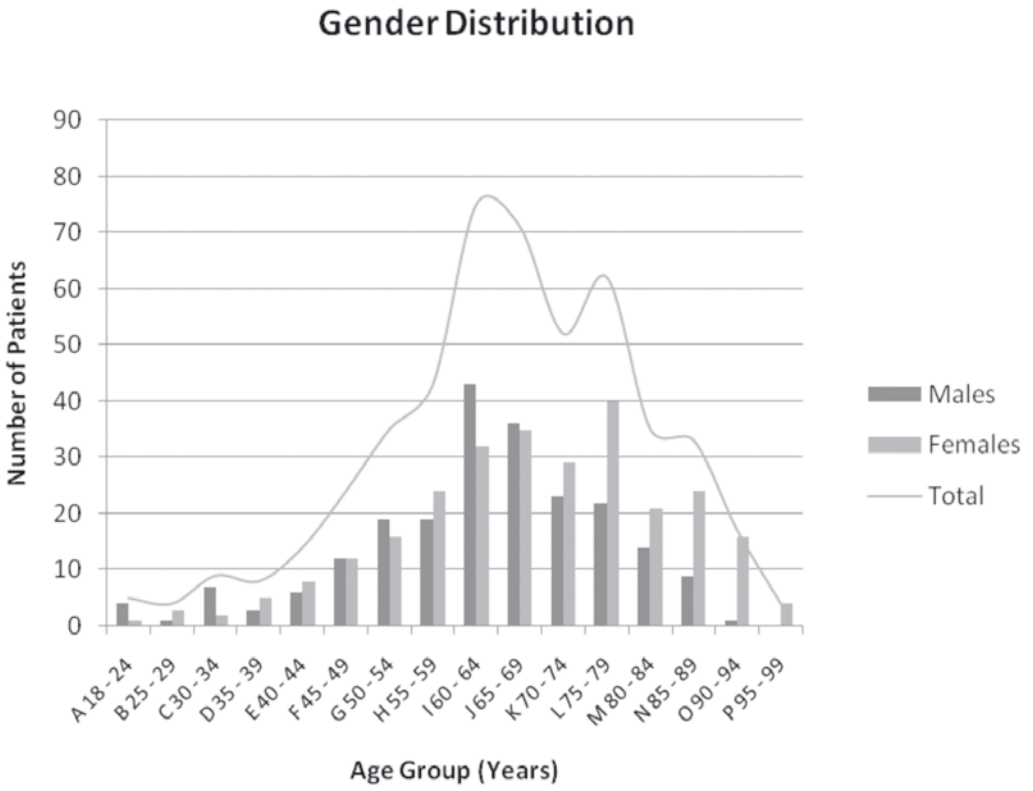

Figure 1: Age distribution of the total population under study categorised by gender

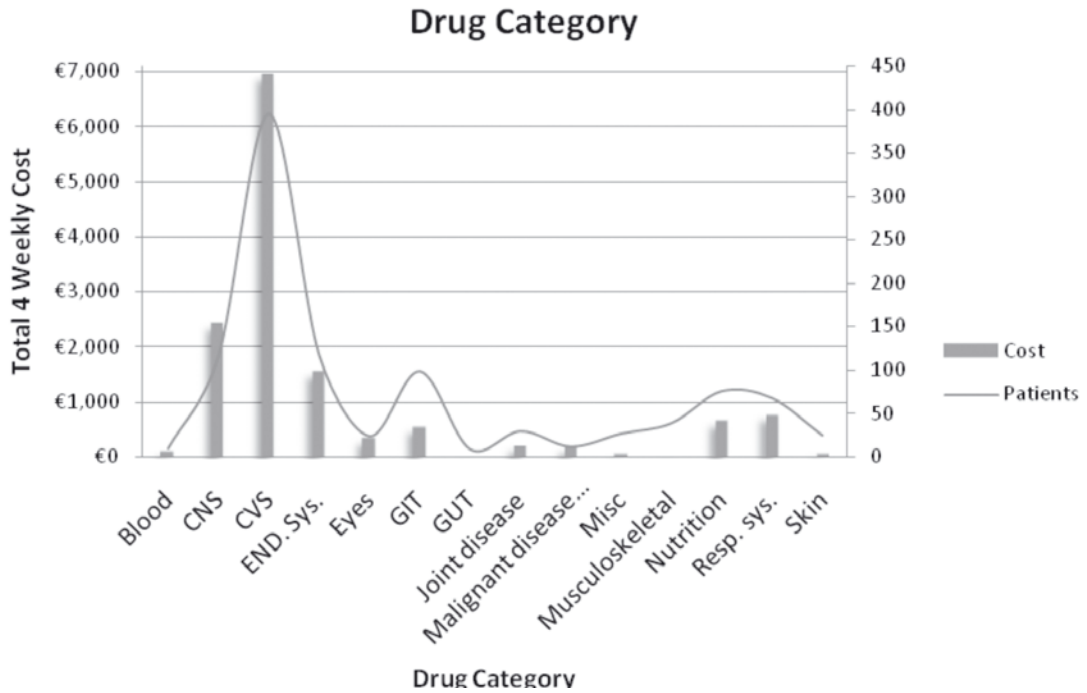

Figure 2: Different drug classes prescribed in the total sample (including four weekly cost and includes the number of patients taking the specified drug classes).

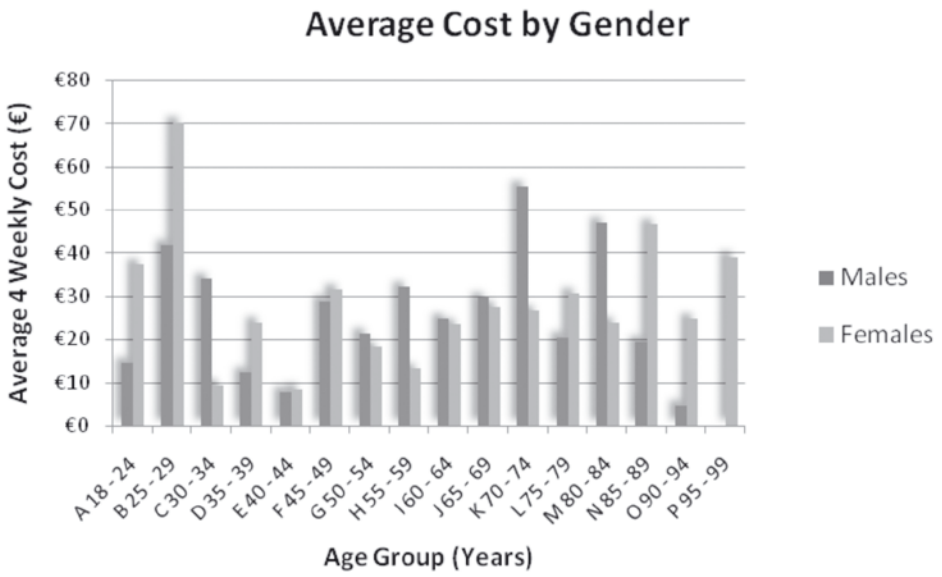

Figure 3: Average 4 weekly cost in euros for male and females according to age

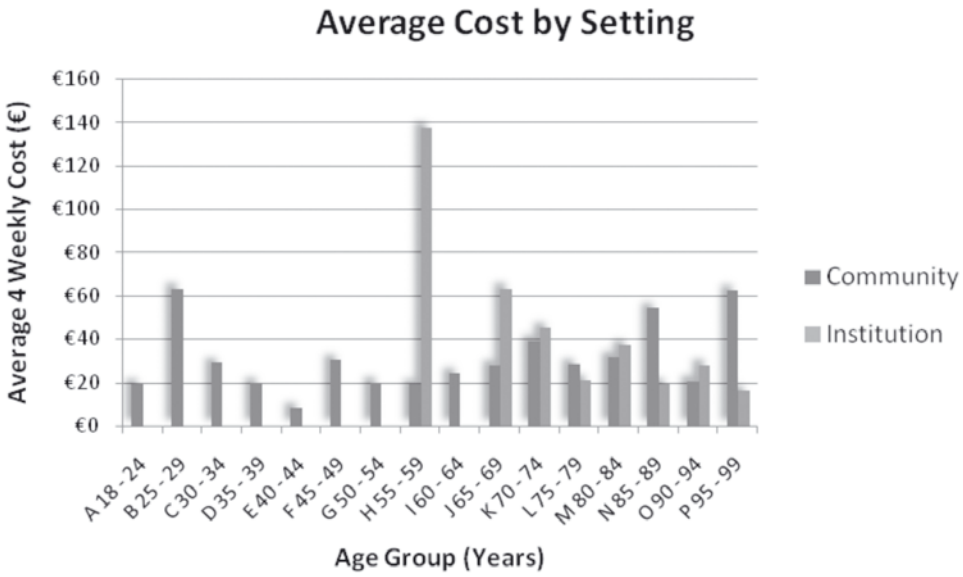

Figure 4: The average 4 weekly drug expenditure on patients living in the community and those living in nursing homes.