Journal of Applied Pharmaceutical Science Vol. 4 (03), pp. 058-061, March, 2014
Available online at http://www.japsonline.com
DOI: 10.7324/JAPS.2014.40312
ISSN 2231-3354

Prescribing patterns of ophthalmological products in a private sector patient population in South Africa

Ilse Truter
Professor in Pharmacy, Director of DURU, Department of Pharmacy, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.

ARTICLE INFO

Article history:
Received on: 12/12/2013
Revised on: 11/01/2014
Accepted on: 14/02/2014
Available online: 30/03/2014

Key words:
Ophthalmology, Eye conditions, Drug utilization; Prescribing patterns

ABSTRACT

Studies on the prescribing patterns of ophthalmological products are scarce. The primary aim of the study was to determine the prescribing patterns of ophthalmological products in a private sector patient population in South Africa. A retrospective drug utilization study was conducted on a 2011 database containing 2 298 312 records for medicine, procedures and medical devices. All records for ophthalmological products were extracted and analysed. A total of 8 428 patients (52.81% males) received 17 087 ophthalmological products. The average age of patients was 36.83 (SD=21.32) years, with 35.92% of products prescribed to patients between 40 and 59 years of age. Anti-infectives accounted for 25.45% of prescribing frequency and 10.63% of prescribing cost, and anti-infectives combined with corticosteroids for 15.44% of prescribing frequency and 17.78% of cost. Only 4.38% of patients received products for glaucoma, accounting for 12.09% of prescribing frequency and 24.66% of cost. The average age of patients on glaucoma products was 61.64 (SD=16.07) years. Antiviral products had the highest average cost (only one trade name, no generic equivalent was available for this product). A third of products were prescribed on a chronic basis. More studies are needed to determine the treatment of eye conditions in South Africa.

INTRODUCTION

Ophthalmic conditions and visual impairment pose a significant financial burden to both individuals and on society. It underlies some of the health outcomes most costly to human health, human capital (including disability and quality of life) and the economy of a country. The World Health Organization (WHO, 2012) estimates that 285 million people are visually impaired worldwide: 39 million are blind and 246 million have low vision. Approximately 90% of the world's visually impaired live in developing countries (WHO, 2012). Despite the fact that the number of people visually impaired from infectious diseases has greatly reduced in the last 20 years, it is still estimated that 80% of all visual impairment can be avoided or cured (WHO, 2012). Studies on the prescribing patterns of ophthalmological products are scarce. Drug utilization studies that were found in the literature regarding the prescribing patterns of medicines used in ophthalmology were mostly conducted in India (Biswas *et al.*, 2001; Gangwar *et al.*, 2011; Maniyar *et al.*, 2011; Mohanty *et al.*, 2003; Nehru *et al.*, 2005; Prajwal *et al.*, 2013). No studies could be found on the prescribing patterns of ophthalmological products in South Africa. The primary aim of the study was therefore to determine the prescribing patterns of ophthalmological products in South Africa in a private sector patient population.

METHODOLOGY

A retrospective, cross-sectional drug utilisation study was conducted on claims data for 2011 of a medical insurance (medical aid) administrator. The total database contained 2 298 312 records for medicine, medical devices and procedures. All records for ophthalmological products were extracted for analysis (MIMS Category 15). Each medication record contained information on the age and gender of the patient, with a unique number to identify each patient, the date of the prescription, detailed information on the dispensed drug (name, package size, formulation, strength and quantity) and amount claimed and paid. The Anatomical Therapeutic Chemical (ATC) Classification System (ATC / DDD Index 2011, 2011), MIMS (2011) and the

** Corresponding Author*
Drug Utilization Research Unit (DURU) Department of Pharmacy PO Box 77000 Nelson Mandela Metropolitan University (NMMU) Port Elizabeth 6031 South Africa. Telephone:+27-41-504 2131 (Office) Fax:+27-41-504 2744. E-Mail: ilse.truter@nmmu.ac.za

South African Medicines Formulary (SAMF, 2012) were used to identify medicines. Microsoft Access® and Excel® were used to analyse the data. Descriptive statistics were calculated. One Euro (€1.00) was equal to R9.81 (South African Rand), one US Dollar ($1.00) was equal to R6.76 and one British Pound (£1.00) was equal to R10.85 at the time of the study (30 June 2011).

Limitations of the study were that no clinical information or diagnoses were available in the database, and that only data of patients served by the private health care sector in South Africa were included in the study.

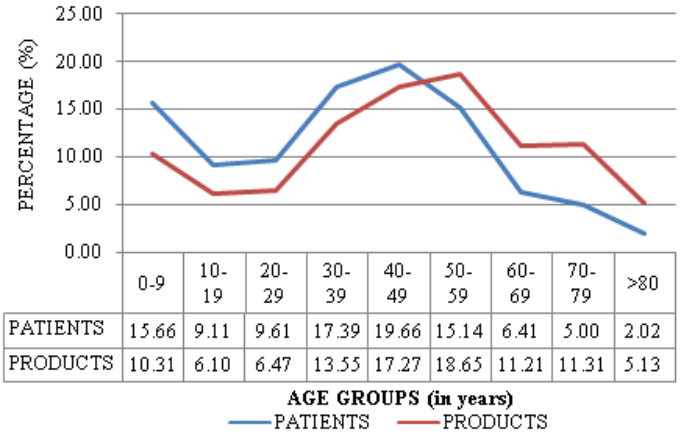
Patients served by the government or state's health care system (the public health care sector) were therefore not included in the study. Permission to conduct studies on prescription databases has been obtained from the Research Ethics Committee (Human) of the Nelson Mandela Metropolitan University (ethics clearance number: H08-HEA-PHA-005).

RESULTS AND DISCUSSION

Demographic information of patients

A total of 8 428 patients (52.81% males) were prescribed 17 087 ophthalmological products at an average amount paid of R110.81 per product. The average age of patients was 36.83 (SD=21.32) years, with 35.92% of products prescribed to patients between 40 and 59 years of age.

Patients were prescribed an average of 2.03 (SD=2.96) ophthalmic products during the year (females received on average 2.06 (SD=2.79) products and males 2.00 (SD=2.87) products). These findings were in agreement with other studies (Gangwar *et al.*, 2011; Prajwal *et al.*, 2013) in which it was also reported that most patients were males, and that most patients belonged to the age group 46 to 60 years.



	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	>80
PATIENTS	15.66	9.11	9.61	17.39	19.66	15.14	6.41	5.00	2.02
PRODUCTS	10.31	6.10	6.47	13.55	17.27	18.65	11.21	11.31	5.13

Fig. 1: Percentage of patients and products in the different age groups.

Overall prescribing patterns

Fig. 1 shows the percentage of patients and products dispensed in the different age groups. Patients under 10 years of age were prescribed a higher number of products, whereafter the younger age groups (10-29 years) were prescribed proportionately less products.

After the age of 50 years patients were again prescribed proportionately more products.

Only 31.05% of products were prescribed on a chronic basis. Most of the products were prescription -only medicine, with a quarter of the products (25.62%) available without a prescription. Seasonal variations in prescribing were investigated, but as can be seen in Fig. 2, no clear pattern could be observed. There was generally a slight decrease in the prescribing frequency of ophthalmological products over the year as indicated by the trendline.

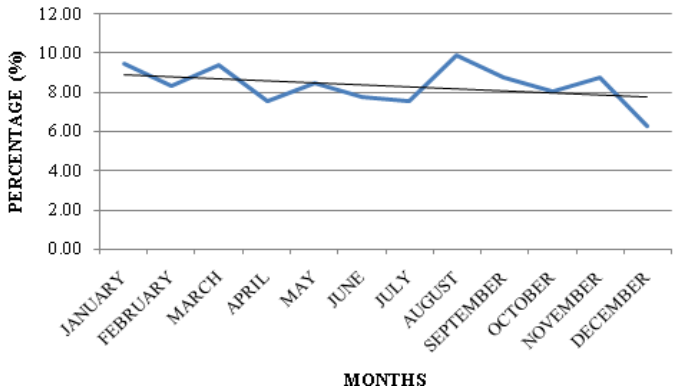


Fig. 2: Prescribing frequency of ophthalmological products according to months (n=17 087).

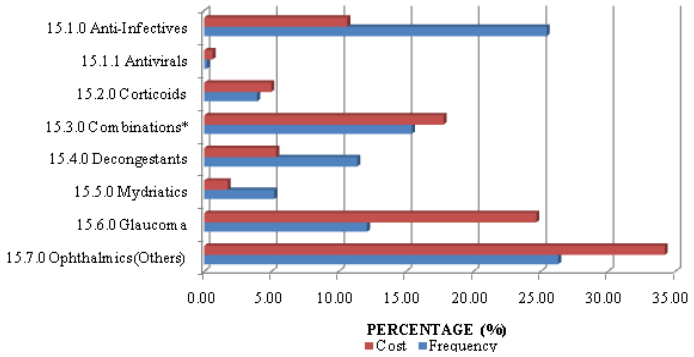


Fig. 3: Percentage prescribing frequency and cost of ophthalmological classes. MIMS category 15.3.0 refers to combinations of anti-infectives with corticoids.

Classes of ophthalmological products prescribed

The percentage prescribing frequency and cost of the ophthalmological products is given in Fig. 3. The category "Ophthalmics (Others)" refers to a wide variety of products, such as anti-allergic eye drops, fluorescein, hyaluronate injections for eye surgery, and tear replacement eye drops and gels. Only 4.38% of patients received products for glaucoma, accounting for 12.09% of prescribing frequency and 24.66% of cost. The chi-square test was used to detect differences between the prescribing frequency of the different classes of products for females and males (χ^2=61.997; d.f.=7; p<0.0001). Differences were observed. Proportionately more females were prescribed products for glaucoma, with 13.96% of products prescribed to females and only 10.44 to males. The average age of patients on glaucoma products was 61.64 (SD=16.07) years, which is older than the average age of all patients in the study.

Table. 1: Ten Most Frequently Prescribed Trade Name Ophthalmological Products According to Gender.

Rank	Trade Name (Active Ingredient)	Female		Male		Both Genders	
		Number	%	Number	%	Number	%
1	Chloramex® 3.5 g (1%) Ophthalmic Ointment (Chloramphenicol 3.5 g)	710	8.86	975	10.74	1685	9.86
2	Covomycin-D® 7.5 ml Drops (Chloramphenicol 2 mg, Neomycin Sulphate 5 mg, Dexamethasone Na Phosphate 0.5 mg/ml)	372	4.64	433	4.77	805	4.71
3	Spersallerg® 10 ml Drops (Antazoline HCL 0.5 Mg, Tetryzoline HCL 0.4 mg/ml))	333	4.16	447	4.93	780	4.56
4	Novesin Wander® 3 ml drops (benoxinate (oxybuprocaine HCl) 0.4 g, chlorhexidine diacet 0.01%, sterile water to 100 ml)	139	1.73	377	4.15	516	3.02
5	BSS solution® 15 ml (NaCl 6.4 mg, Na-acet 3.9 mg, Na-citr 1.7 mg, KCl 0.75 mg, CaCl 0.48 mg, MgCl 0.3 mg/ml)	208	2.60	293	3.23	501	2.93
6	Tobradex® 5 ml suspension (dexamethasone 1 mg, tobramycin 3 mg/ml)	203	2.53	255	2.81	458	2.68
7	Oculerge® 15 ml eye drops (antazoline HCl 0.5 mg, tetrahydrozoline HCl 0.4 ml/1 ml)	193	2.41	221	2.44	414	2.42
8	Covomycin® 7.5 ml drops (chloramphenicol 2 mg, neomycin sulphate 5 mg, naphazoline HCl 0.5 ml/ml)	180	2.25	222	2.45	402	2.35
9	Minims Tetracaine HCl® (was Minims Amethocaine) solution (tetracaine HCl 5 mg/0.5 ml)	183	2.28	216	2.38	399	2.34
10	Xalatan® 2.5 ml (latanoprost 50 mcg/ml) eye drops	206	2.57	182	2.01	388	2.27

MIMS category 15.3.0 refers to combinations of anti-infectives with corticoids. Anti-infectives accounted for 25.45% of prescribing frequency and 10.63% of cost, and anti-infectives combined with corticosteroids for 15.44% of prescribing frequency and 17.78% of cost. In the study by Prajwal and others (2013), 58.43% of products were antibiotics. Antiviral products had the highest average cost per product of R329.50. Aciclovir is the drug of choice for all herpes simplex infections. These infections may cause serious sight-threatening eye infections, and should be treated by specialist ophthalmologists. There was only one antiviral product on the market (Zovirax® ophthalmic ointment (30 mg/g)) with no generic equivalent). Mydriatics had the lowest average cost of R37.19 per product.

The combination of corticosteroids and anti-infectives are used by some ophthalmologists to treat conditions where both active ingredients may be required, for example post-operatively. In this study, these products accounted for 15.44% of prescribing frequency and 17.78% of cost. Combination therapy in general practice is strongly discouraged and close specialist supervision is recommended (SAMF, 2012). Yet, in this study, the second and eighth most frequently prescribed trade name products (see Table 1) were combinations of a corticosteroid with an anti-infective.

It was interesting that in children 5 years and younger, anti-infectives accounted for 60.05% of the products prescribed, followed by combinations of anti-infectives with corticoids (20.27%). Chloramphenicol is commonly used in conjunctivitis prophylaxis in newborn babies (SAMF, 2012).

Dosage forms prescribed

Eye drops were the most commonly prescribed dosage form accounting for 71.53% of prescribing frequency, followed by eye ointments (15.69%), solutions (11.01%) and injections (1.77%). This finding is similar to that of several other studies (Biswas *et al.,* 2001; Gangwar *et al.,* 2011; Mohanty *et al.,* 2003; Maniyar *et al.,* 2011; Prajwal *et al.,* 2013; Nehru *et al.,* 2005) who found that eye drops were the most commonly prescribed.

Trade name products and active ingredients prescribed

A total of 177 different trade name products and dosage formulations were prescribed. The most often prescribed trade name product was a chloramphenicol ophthalmic ointment. Chloramphenicol is the topical antibiotic most frequently used in South Africa (Smit, 2012; SAMF, 2012). It has a broad spectrum of antibacterial activity (effective in more than 99% of superficial eye infections) and excellent penetration (Smit, 2012; SAMF, 2012).

If only the antiinfectives are considered, chloramphenicol represented 52.02% of all the anti-infectives prescribed, followed by ofloxacin (11.13%) and chloramphenicol in combination with neomycin and naphazoline (9.25%). The majority (94.30%) of these products were prescription only medicine. Studies in other countries have indicated that the fluoroquinolones (especially ofloxacin) are commonly prescribed (Topno *et al.,* 2012; Maniyar *et al.,* 2011).

CONCLUSION AND RECOMMENDATIONS

This study provided a general insight into the prescribing patterns of ophthalmological products in South Africa. No similar study could be found in the literature. Eye drops were the most frequently prescribed dosage form, supporting the use of topical preparations for treating eye diseases as they have site specific action, less systemic absorption resulting in fewer side effects and they are convenient for patient self-administration. More studies are, however, needed to determine the treatment of common eye conditions in South Africa. The importance of diagnoses in databases to interpret the findings of drug utilisation studies cannot be overemphasized. Further studies should also investigate generic prescribing and dosage instructions.

ACKNOWLEDGEMENTS

The medical aid administrator for providing the data for the study.

This work is based upon research supported by the National Research Foundation (NRF). Any opinion, findings and conclusions or recommendations expressed in this paper are those of the author and therefore the NRF do not accept any liability in regard thereto.

REFERENCES

ATC/DDD Index 2011. 2011. Oslo: WHO Collaborating Centre for Drug Statistics Methodology. [ONLINE]. Available at: http://www.whocc.no/atc_ddd_index/ [Accessed: 12 September 2011].

Biswas NR, Jindal S, Siddiquei MM, Maini R. Patterns of prescription and drug use in ophthalmology in a tertiary hospital in Delhi. Brit J Clin Pharmacol, 2001; 51 (3): 267–269.

Gangwar A, Singh R, Singh S & Sharma BD. Pharmacoepidemiology of drugs utilized in ophthalmic outpatient and inpatient department of a tertiary care hospital. J App Pharm Sci, 2011; 1 (9): 135-140.

Maniyar Y, Bhixavatimath P & Akkone V. A drug utilization study in the ophthalmology department of a medical college, Karnataka. J Clin Diagn Res, 2011; 5 (1): 82-84.

MIMS (Monthly Index of Medical Specialities). June 2011. Snyman JR (ed). Saxonwold: MIMS. 51 (6).

Mohanty S, Mohapatra S. Drug utilization pattern of topical ocular antimicrobials in a tertiary care hospital. Ind J of Pharmacol, 2003; 35: 399.

Nehru M, Kohli K, Kapoor B, Sadhotra P, Chopra V, Sharma R. Drug utilization study in outpatient Ophthalmology Department of Government Medical College Jammu. JK Science, July-September 2005, 7 (3): 149-151.

Prajwal P, Mohandas R, Sharath KK, Srinivas BU, Floyd VD. Drug utilization pattern in ophthalmology department at a tertiary care hospital. Int Res J Pharm, 2013; 4 (8): 205-210.

SAMF (South African Medicines Formulary), 10th ed. 2012. Rossiter D (ed). Cape Town: Health and Medical Publishing Group of the South African Medical Association.

Smit D. Anti-infective ophthalmic preparations in general practice. S Afr Fam Prac J, 2012; 43 (4): 302-307.

Topno I, Chennama B, Yugandhar B & Balakrishnan S. Antibiotic prescribing pattern in ophthalmology outpatient department in a tertiary care hospital. J Pharmacol Pharmacother, 2012; 3 (2): 190–191.

WHO (World Health Organization). 2012. Visual impairment and blindness. Fact Sheet Number 282, June. [ONLINE] Available at: http://www.who.int/mediacentre/factsheets/fs282/en/# [Accessed: 17 August 2013].

How to cite this article:

Ilse Truter. Prescribing patterns of ophthalmological products in a private sector patient population in South Africa. J App Pharm Sci, 2014; 4 (03): 058-061.