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Research Article

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Prevalence of Ophthalmic Diseases, Drug Utilization and Vision Function Related Qol in Ophthalmic Patients at a Tertiary Care Hospital

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Abstract: Day by day, the number of individuals suffering from ophthalmic diseases has been increasing. Therefore, it is essential to determine the magnitude of the problem in different local regions as well as at the country level. Hence a prospective observational study was planned to evaluate the prevalence of various ophthalmic diseases, drug utilization patterns, and quality of life in ophthalmic patients. Five hundred patients were enrolled in the study. Data were analyzed according to the patient's age, gender, type of diseases, prescribing pattern, vision function-related quality of life. Majority of patients had mature cataract disease (20%), followed by immature Cataract (15.6%), refractive errors (18.4%), Conjunctivitis (9.8%), glaucoma (4%), and superficial punctate keratitis (4%), Pterygium (4.2%), etc. Fluoroquinolones were the most commonly prescribed antibiotics, but this class of drugs was prescribed in combination mainly with steroids. The most common anti-allergy drugs prescribed were olopatadine and ketorolac. Vision function-related quality of life in ophthalmic patients was assessed using the VF-14 SCALE. It revealed that the majority of patients have high vision function-related quality of life of about 80-100 VF SCORE in 45.2%. This study states that Cataract was the leading disease in the ophthalmology department, and vision function was affecting the quality of life in these patients.

Keywords: Ophthalmic Patients, Cataract, Glaucoma, Drug Prescriptions, Utilization, Quality of Life

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1. INTRODUCTION

The individuals suffering from vision problems throughout the world has been estimated to be as high as 40 million in both developing and developed countries. The majority of these individuals are in age groups of above 55 years. This creates a need for additional services, programs, and treatments for visually impaired patients. Therefore, it is crucial to determine the magnitude of the problem in different countries, as well as globally. Identification of the specific causes of visual loss and blindness is essential in order to develop an appropriate treatment, rehabilitation, and service programs. In addition, identification of risk factors is useful to find out a new way for research. Changing prevalence of various diseases at various time periods aids to develop prescribing patterns and to recognize new diseases that are more frequent[1]. The periodical auditing of drug utilization patterns is vital for the promotion of rational use of drugs, increases the therapeutic efficacy and cost-effectiveness, decreases the adverse effects, and provide feedback to the prescribers[2]. An essential point of contact between the healthcare provider and the user is Drug prescriptions form, which throws an insight into the nature of the healthcare delivery system[3]. There is a lot of literature on the prescription or drug utilization pattern, but most of them are restricted to a specific disease in the ophthalmic department. There is a lack of research regarding the prevalence of ophthalmic diseases and the pattern of drug use and quality of life in ophthalmic patients. Low vision is defined as any chronic visual impairment that interferes with day to day function and is not correctable by ordinary spectacles or contact lenses. To identify the tests of visual function that correlate best with the patient's ability to function and to develop appropriate QoL instruments for ophthalmic disorders is important[4]. The loss of visual abilities can have a profound effect on the life of an individual, by limiting the performance of even simple everyday tasks, such as dressing, eating, writing, traveling from place to place, and communicating with others. Hence, persons with low vision may feel frustrated and restricted in their lifestyles[5]. Low-vision services improve the use of remaining vision, increase independence, and improve the quality of life of persons with chronic visual impairments. Low-vision service delivery begins with an extensive interview to learn about the patient's problems, needs, and goals. To promote cost-effective, low vision service distribution and to confirm that all relevant issues are proofed, a standard assessment tool is needed to record the patient's self-report of difficulty performing events at the preliminary interview, and the change in difficulty performing these activities in the community after rehabilitation[5]. Previously physical performance is measured to know the impact of cataract surgery. Other advantages of performance measures over self-reported disability include the fact that change over time can be assessed on a continuous rather than a categorical scale and that reliability and between-subjects comparisons may be better by using questionnaires[6]. The VF-14 demonstrated a moderately strong positive association with patient self-rating of the amount of trouble, satisfaction, and overall quality of vision. Correlations between the 36-Item Short-Form Health Survey, visual acuity, and the global scales were mild to moderate[7]. The VF-14 was moderately correlated with visual acuity in the better and the worse eyes[7]. Best-corrected visual acuity was associated with the visual function score on the modified VF-14 questionnaire[8]. The VF-14 was developed by Steinberg[9]. It is an index of visual function that was designed to assess patients undergoing cataract surgery. Its usefulness has been demonstrated in patients with cataracts, glaucoma, corneal disease, and it has been translated for use in other languages. Because of its ease of administration and high rate of patient compliance, the concise format of the VF-14 is a popular choice. The VF-14 scale ranges from 0 to 100, where 0 indicates that the patient is not able to perform any applicable activities, and 100 suggests that the patient can perform all appropriate activities without difficulty[10]. Studies have reported under-utilization of eye care services in south India due to less accessibility, availability, and affordability of services [11,12]. It is also possible that the utilization of services in this population is related to functional needs. The Studies conducted in other communities have demonstrated the impact of vision impairment and eye diseases on visual function and quality of life[13,14]. Although a previously validated questionnaire to determine the vision-specific quality of life of populations is available, little information is available to relate the impact of vision impairment or eye diseases to vision-specific quality of life and function in this population[15]. Considering these facts in the current study was conducted with the aim of the pharmacoepidemiological analysis of the drugs to define the pattern of use, their availability in the hospital and to evaluate their impact on the quality of life of patients in each prescription of ophthalmic OPD of a tertiary care hospital (Jnanananda Ophthalmic Institute and Lasik center) in Bhimavaram.

2. MATERIALS AND METHODS:

This study was conducted at Jnanananda Ophthalmic Institute and Lasik center, Bhimavaram. In the present study, the prescriptions from the patients diagnosed with ophthalmic diseases were collected. The study was a Prospective and Observational study, carried out over a period of 6 months from Nov 2017 to April 2018, after obtaining institutional ethics committee approval

2.1 Source of data and materials

2.1.1 *Method of collection of data*

- Patient case note/prescription

2.1.2 *Method of collection of material*

- Patient consent form.
- The patient data collection form

2.2 Inclusion criteria

- Patients willing to participate in the study
- Patients diagnosed with ophthalmic diseases of age >18 years

2.3 Exclusion criteria

- Patients who visited the hospital for regular sight checkup without the particular disease
- Patients not willing to participate in the study
- Patients of age <18 years
- Pregnant and lactating women

2.4 Study procedure

2.4.1 *Method of data collection*[1,3,7]

Patients who came to the Outpatient department were based on the inclusion and exclusion criteria. Subjects who

met the inclusion criteria were enrolled for the study. Informed consent was obtained from the patient or attendees of the patient. Details regarding the diagnosis and prescription patterns were obtained from the patient case profile and by observing case notes.

2.4.2 *Research and ethical committee approval*

All procedures performed in human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was started after obtaining clearance from the institutional ethics committee (SVCP/IEC/16/7). Informed consent was obtained from all individual participants included in the study.

3. STATISTICAL ANALYSIS

Descriptive statistical analysis, Percentages, chi-square test has been carried out in the present study using SPSS software. QoL was assessed using the Chi-square test and Pearson correlation analysis. Data presented in the form of graphs using Graph Pad Prism 7 software.

4. RESULTS

A total of 500 patients were enrolled in the study. 48.4% were males, and 51.6% were females with no significant difference in the prevalence of gender (p=0.47). The patients aged from 18-90 years were enrolled, and most of the patients were in the age group of above 55 years (44.6%), followed by 41-55 (19%), 26-40 (26.2%), and 18-25 (10.2%) showing a statistically significant difference in the prevalence between age groups (p=0.0001). Figure 1 represents the percentage distribution of various diseases as observed in the study population. Mature Cataract (20%), Immature cataract (15.6%), Refractive errors (18.4%), conjunctivitis (9.8%), Superficial punctate keratitis (5%), Glaucoma (4%), Fungal corneal ulcer (4%), Keratitis (3%), Non Proliferative Diabetic Retinopathy (2.4%), Proliferative Diabetic Retinopathy (2.2%), Pterygium (2%), Macular degeneration (1.8%), Episcleritis (1.4%), Corneal abrasion (1.4%), Mooren's ulcer (1.2%), Corneal epithelial defect (1.2%), Uveitis (1%), Chronic rhegmatogenous retinal detachment (1%), Vitreous hemorrhage (1%), Nystagmus (0.8%), Central Serous Retinopathy (0.8%), Chalazion (0.6%), Sub conjunctival hemorrhage (0.6%), Iritis (0.4%), Astigmatism (0.4%), Posterior Vitreous detachment (0.2%). The difference in the prevalence of various ophthalmic diseases among the study population is highly statistically significant (p=0.0001). Figure 2 states that, out of 500 prescriptions, most common were eye drops (557), followed by tablets (520), capsules (225), Syrups (150), and Ointments (60) and the difference in the prescription of various dosage forms is statistically significant (p=0.0001). Table 1 gives the details of drug utilization based on WHO/INRUD indicators, which shows that 34.5% of drugs were prescribed from national essential drug list, percentage of encounters with an antibiotic prescribed were 22.4, while those with an injection prescribed were 21.7, the average number of drugs per encounter was three and drugs prescribed by generic name were 3%. Figure 3 represents the list of a different class of drugs that were prescribed in the present study subjects. Antibiotics were the most commonly prescribed class of drugs of about 339 (22.4%), lubricants 308 (20.4%), fatty acid supplements 290 (19.2%), vitamins, and minerals 110 (7.3%) Non-Steroidal anti-inflammatory drugs in 98 (6.5%). There is a significant difference in the prescription pattern of various classes of drugs in the study population (p=0.0001). Table 2 shows that Fluoroquinolone was prescribed in 48.7% of patients, followed by 15.1% with Fluoroquinolone and Steroid, 14.5% with Penicillin (Ampicillin), 12.4% with Fluoroquinolone and NSAID and 9.4% with Aminoglycoside and Steroid. Figure 4 states that the percentage of patients having the cataract disease were (35.6%), others (32.2%), refractive errors (18.4%), Conjunctivitis (9.8%), glaucoma (4.0%). Among these refractive errors, about nine patients had a quality of life less than 60, 12 patients between 60-80, 71 had 81-100. Among the patients having Cataract, about 79 had a quality of life less than 60, 68 had 60-80, 31 had 81-100. Among the patients with Conjunctivitis patients, 48 patients had the QoL 81-100, and one had 60-80. Among the patients with glaucoma, about 6 had a quality of life less than 60, 10 had 60-80, and 4 patients had 81-100. The Pearson correlation was done between Age and VF-SCORE. It shows that there is the statistically significant association between age and VF-SCORE with p-value 0.046, and the correlation between them is a negative (-0.89), which means as age increases by 1 unit there is a decrease in VF-SCORE value by 0.89 units.

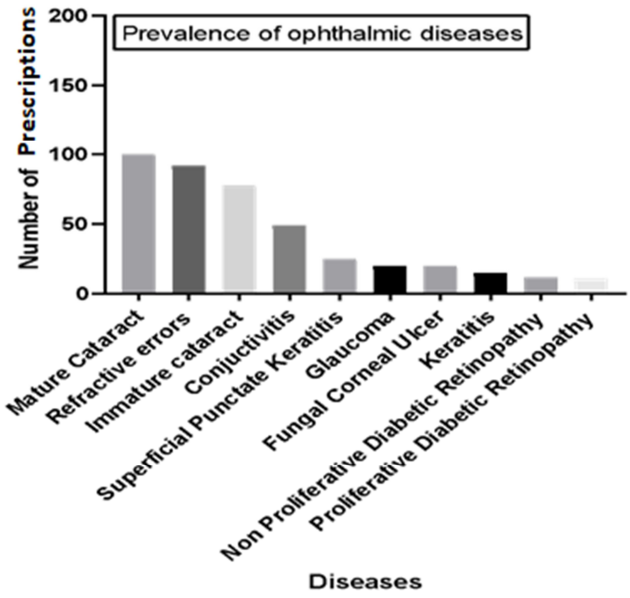

Fig. 1: Different types of diseases diagnosed among 500 prescriptions.

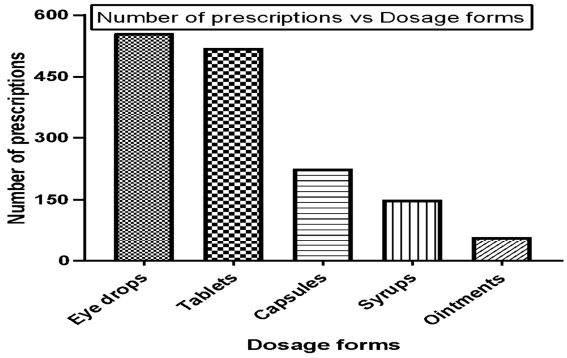

Fig. 2: Types of dosage forms prescribed among 500 prescriptions.

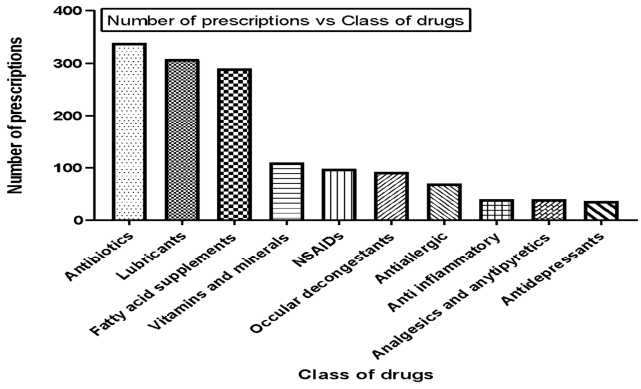

Fig. 3: Types of drug products prescribed.

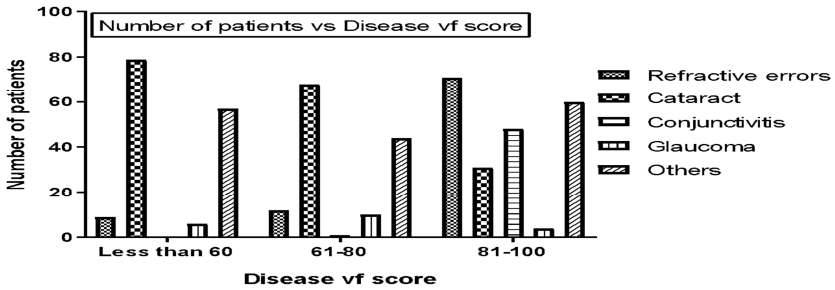

Fig 4: Distribution of VF-SCORES among different ophthalmic diseases.

Table 1: Details of drug utilization based on WHO/INRUD indicators

S.No	Indicators Assessed	Data Value
1.	The average number of drugs per encounter	3
2.	Percentage of drugs prescribed by generic name	3%
3.	Percentage of encounters with an antibiotic prescribed	22.4%
4.	Percentage of encounters with an injection prescribed	0%
5.	Percentage of drugs prescribed from national essential drug list/formulary	34.5%
6.	Patients knowledge of correct dosage	21.7%

Table 2: List of Antimicrobial Drugs prescribed for the overall period in ophthalmic patients.

Antimicrobial Class	Number (Out Of 339)	Percentage (%)
FLUOROQUINOLONE	165	48.7%
FLUOROQUINOLONE+STEROID	51	15.1%
PENICILLIN(AMPICILLIN)	49	14.5%
FLUOROQUINOLONE+NSAID	42	12.4%
AMINOGLYCOSIDE+STEROID	32	9.4%

5. DISCUSSION

This study was done to analyze the pharmaco epidemiological of the drugs to define the pattern of use, their availability in the hospital and to evaluate their impact on the quality of life of patients in each prescription of ophthalmic OPD of a tertiary care hospital. In the present study, it was observed that Cataract is the most leading ophthalmic disease. This observation is in agreement with the findings reported in the worldwide population[2]. Sudanese patients showed a higher percentage of glaucoma (13.3%) and ocular hypertension (8.3%). Yemeni patients showed the highest prevalence of amblyopia (6.7%), diabetic retinopathy (8.6%), and Cataract (4.2%)[16]. The most common causes for ocular consultation were Refractive Error (29%), Allergic Conjunctivitis (24.88%), Bacterial Conjunctivitis (1.8%) and Presbyopia (26.26%). The cases most frequently seen were from India (62.21%), South Africa (7.83%) and Bangladesh (3.68%)[17]. Drug utilization studies were necessary for obtaining data about the patterns and quality of use, the determinants of drug use, and the outcomes of use. The World Health Organization, drug use indicators, were highly standardized and were recommended for inclusion in drug utilization studies. The current study efforts mainly report the present prescribing patterns and drug utilization with the WHO core prescribing indicators in Ophthalmology Outpatient Department. An average number of drugs per prescription is a vital index as it tends to measure the degree of polypharmacy. In the present study, an average number of medications per prescriptions were 3, which fell within the range reported in the previous studies where the average number of drugs per prescription was 3, 2, 2.3, and 1.8, respectively[3,18-20]. It emphasizes the need for periodic review and educational intervention in prescribing practices. Higher the number of drugs more significant is the risk for drug interaction, cost of hospital, and prescribing errors. In a resource-constrained country like India, generic prescribing is a potential measure for reducing the drug cost, thus increasing people's access to medicine. Reduce healthcare costs, regulatory authorities from various countries advised generic prescribing similar endeavors has also been taken up by the local state government[20]. In this backdrop, the percentage of drugs prescribed by generic names in our study was 3%, which is lower than what was reported in previous studies where it was 35, 16, and 17 percent, respectively [18-20]. In this study, the brand name was most commonly prescribed accounting for (97%) suggesting the influence of pharmaceutical companies and the popularity of brands. Various dispensing and prescribing errors can be minimized and provide economic as well as rational treatment by prescribing generic drugs. The percentage of drugs prescribed from the NEDL/NFI24 (National List of Essential Medicines of India)[21] was 35%, which is higher (19%) compared to the study conducted in India. In the present study, antibiotics were frequent, and the number of encounters with antibiotics was 22.42%. In other hospital-based studies the encounters with antibiotics were 30, 36, and 32 percent, respectively[3,19,20,]. The low use of antibiotics may reflect the less severity of infections and high sanitation in the region and patient awareness regarding preventive measures to be taken to prevent further worsening the condition of the disease. The patient's knowledge of the correct dosage schedule was 22%. The patient's knowledge of the correct dosage schedule ensures adherence to treatment compliance without indiscriminate use and promotes rational drug use with the proper counseling by a pharmacist. Thus, here, in this case, a pharmacist's role is necessary for effective treatment. Antibiotics constituted 22% (339) of the total drugs prescribed. Out of which 55% (214) were single antibiotics (ciprofloxacin, moxifloxacin, and ampicillin) and 45% (125) were prescribed as a fixed-dose combination (FDC) with NSAIDS - moxifloxacin+ketorolac (20 prescriptions), moxifloxacin+bromfenac (12 prescriptions), FDC with steroids (ofloxacin with betamethasone) 51 prescriptions, tobramycin with loteprednol in 32 prescriptions. Fluoroquinolones were the most common group of antibiotics prescribed, which were similar to reports of previous studies done in ophthalmology[15]. Ciprofloxacin, moxifloxacin, were commonly prescribed in the present and previous studies [15,22]. Thus there is a chance of emergence of resistance to these ocular antibiotics. Prescribing antibiotics up to 15-20% is said to be acceptable by WHO in countries with more infectious diseases[23]. An increasing trend in the prescribing of topical anti-allergy (olopatadine and ketorolac) and ocular lubricants was documented in this study[15]. This could be due to the readiness of new drugs in the management of allergic Conjunctivitis and dry eye syndrome. The most commonly prescribed dosage form is eye drops. A majority of eye drops (36.8%) are ocular lubricants; few belong to antibiotics; the next leading dosage form is tablets (34.39%), capsules (14.8%), syrups (9.9%) and ointments (3.9%) respectively. However, information about the dosage form mentioned is

missing for about 9.7%, duration of treatment is missing in 2.3%, and the frequency of drug administration was missing in 2.3% of the prescriptions in the present study compared to 22.1% in the study[18]. The critical factors which are not clearly stated in the prescription are the duration of therapy and frequency of drug administration, which can culminate in the indiscriminate and irrational use of drugs. Thus, overall the present study has pointed toward some lacunae in the low generic prescribing, lack of information about the frequency of administration, and duration of therapy in many prescriptions. The research suggests a need for an increase in the art of rational prescribing, which can be achieved through short-term training sessions, continuing medical education, prescription audits at regular intervals. The prescribing pattern observed in the present study was knowledge-based and in accordance with the accepted modes of treatment of ophthalmic diseases, but the review showed ample scope for improvement in encouraging the ophthalmologists to prescribe by generic name and selection of essential drugs from NEDL24.25/NFI[21]. The research suggests educational initiative, development of drug policy, and NEDL based hospital formulary reduce the drug cost and ensure rational use of medicines. The VF-14 questionnaire was assessed in this study to demonstrate vision function-related quality of life in these patients. In this study, no patients have QoL between 0-20.around 10.2% patients belongs to 21-40 range, 13.8% to 41-60 range, 30.8 % patients to 61-80 range,45.2 % patients to 81-100 range similar to study conducted [24]. The patients belonging to this study have diseases like Cataract (35.6%), others (32.2%), refractive errors (18.4%), Conjunctivitis (9.8%), glaucoma (4.0%). In the patients having refractive errors, 21-40 score was found in 2 refractive error patients,41-60 score in 7 patients, 61-80 score in 12 patients,81-100 score in 71 patients, whereas in cataract patients 21-40 score was found in 36 patients,41-60 score in 43 patients,61-80 score in 68 patients,81-100 score in 31 patients. In conjunctivitis patients, No patients belong to a 0-60 score, one patient has a 61-80 score, and 48 patients have 81-100 scores. In glaucoma patients, no patients have enrolled with QoL score 0-20, and 2 patients have a 21-40 score, four patients have 41-60 scores, four patients have 81-100 scores each, ten patients have 61-80. For other ophthalmic disease patients, nine patients were enrolled in the 0-20 score, 13 patients have 21-40, 35 patients have 41-60, 44 patients have 61-80 and the remaining 60 patients have VF-SCORE 81-100, similar to the previous study[22]. The Pearson correlation was done between Age and VF-SCORE; it shows that both are statistically significant with p-value 0.046, and the correlation between them is negative Pearson correlation (-0.89). Thus it states that there is no effect of age on VF-SCORE in ophthalmic patients, but age has an effect on the prevalence of diseases like refractive errors (p=0.435), glaucoma (p=0.515), others (p=0.338), conjunctivitis (p=0.73).similarly gender also has the effect on prevalence of refractive error (p=0.141), cataract (p=0.328), conjunctivitis (p=0.577), glaucoma (p=0.444), others (p=0.273) diseases. In the case of VF-SCORE and Glaucoma, there is a relation between these two with the level of significance p=0.159.

6. CONCLUSION

The most prevalent disease among the study population is Cataract, followed by immature Cataract, Conjunctivitis, Glaucoma, SPK, Corneal ulcer, and keratitis. Also, there is a need for the expansion of prescribing guidelines, prescribing through generic names, and educational initiatives to reassure the rational and appropriate use of drugs. Improvement through continuous education is desired on the part of prescribers to ensure a good standard of care. Thus, periodical auditing of the prescriptions will help to measure the impact of the intervention on the prescribing pattern. By this study, we observed that patients who had undergone surgery now had a better visual function, and QOL is also higher than other cataract patients. Thus there is a need to develop measures to prevent an occurrence of Cataract and better treatment strategies to improve QOL in those patients.

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8. CONFLICT OF INTEREST

Conflict of interest declared none.

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