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PREVALENCE OF EYE DISEASE AND ITS TREATMENT PATTERN IN BANGLADESH: A CASE STUDY OF ISPAHANI ISLAMIA EYE HOSPITAL

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Abstract

To investigate the common type of eye diseases; type of drugs prescribe for the treatment; evaluation of the diseases; and the prevalence of polypharmacy in the prescription of hospital. In this cross-sectional study, total 170 appropriate prescriptions were collected from Ispahani Islamia Eye Hospital, Dhaka, Bangladesh for a time period of one month from 20 September to 20 October 2018, and analyzed the results and information statistically. Physicians were not informed during the survey to avoid possible changes in their prescribing habits. When the number of adult patients were high, among all eye diseases the prevalence of allergic conjunctivitis was the highest (34.12 %.) In case of cataract; and redness of the eye the percentage was highest compared to other disease types in the 70–80 years and 80–90 years age group. Except eye allergy and allergic inflammation; eye pain and swelling; and bacterial ocular infection, the percentages were high for most of the patients who were adult. Antibiotic was the class of drug prescribed at the highest rate (32%) whereas percentages of antihistamine; antifungal; and non-classified medicine were also high as per the results of our study. The highest prescribed drug among antibiotic was ciprofloxacin (50%); among antihistamine olopatadine was prescribed to 60% patient; among analgesic paracetamol was prescribed to 95% patient; among antiviral dexamethasone sodium phosphate was prescribed to 80% patient; and among antifungal natamycin was mostly prescribed (70%). Around 53% of the prescription prescribed to the patient had three or more drugs for the treatment of eye disease which is sign of polypharmacy and may cause serious adverse drugs reaction, and related damage to the patient. Allergic conjunctivitis; eye allergy and allergic inflammation; eye pain and swelling; and glaucoma are the most common eye diseases among all types of eye disease. Polypharmacy was present in most of the prescription that may cause serious adverse drugs reaction. Whatever the eye's problem it is, whether he or she is young or old requires immediate and proper treatment to save this essential part of body.

Keywords: *Cataract; glaucoma; antibiotic; antihistamine; polypharmacy*

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Introduction

Vision allows us to do the basic things such as reading and writing as well as to do other daily activities including learning, walking, buying, and taking care of personal hygiene without help of others but when one of these is defective, dependence the other one is increased.[1,2] Presently, preventing blindness has been identified as a global public health concern in the world.[3] Unfortunately ophthalmology lags behind in this field of quality of life assessment although our discipline and the organ with which we deal have a crucial impact on every aspect of life.[4] Visual impairment represents one of the major health issues with an estimated 253 million people are suffering worldwide, of which approximately 36 million are blind although vision impairment can be prevented or cured in almost 80% of these conditions.[5] According to World Health Organization(WHO), Bangladesh is part of the South East Asia region comprises about a quarter of the world's total population and eye care services here in Bangladesh are mainly provided by the government, local and international non-governmental organizations (NGO) and also by charitable organizations.[6] It has been found that poor ocular health knowledge is a key contributor to the dichotomy that remains between disease prevalence and service uptake.[7] Various studies have found that individual socio-economic indicators such as low income, low education levels, and low social class are the key factors contributing to increased prevalence of visual impairment and blindness in low income countries.[8] A joint program between WHO and the International Agency for the Prevention of Blindness (IAPB) launched VISION 2020: The Right to Sight in 1999 to eliminate avoidable blindness by the year 2020.[9] Awareness of the people about common eye diseases and their treatment can play a vital role in encouraging people to take timely eye care and can therefore help in reducing the burden of visual impairment.[10] A major cause greatly hindering public health strategies is a lack of proper awareness about eye conditions which has been shown to be associated with poorer outcomes in terms of prevention of eye disease, eye care use, and its treatment.[11] We can minimize this burden of preventable blindness to great extent by increasing the level of knowledge and awareness about common eye diseases so that common people be aware of eye care and timely treatment.[12]

Eye diseases that are common in Bangladesh includes dry eye, allergic conjunctivitis, glaucoma, watery eyes, night blindness, vision impairment or blindness, blepharitis, myopia, blurry vision and cataract formation.[13] The prevalence of refractive errors has been conducted recently where 22% of this adult study population (aged 30 years or older) had myopia (less than -0.5 D) and 20.6% had hyperopia (more than +0.5 D).[14] Eye care services in Bangladesh are provided mainly by 3 ways: hospital based clinical services, usually given in urban areas without outreach activities; surgical eye camps; comprehensive eye care that links various activities in the community with primary eye care and tertiary services.[15] Due to the absence of proper and

reliable population based epidemiological data on blindness and low vision is a major drawback to the effective national planning of eye care programs in Bangladesh.[16]

In our study we mainly focused to identify the type of patients go to eye hospital, type of diseases they suffer from, the class of the medicine prescribe for treatment, and the prevalence of polypharmacy.

Methods

The methodology of this survey consists of practical field observation. Respondents for this study were randomly selected. Total 170 prescriptions issued from the Dhaka Ispahani Islamia Eye Hospital and collected for a time period of one month from 20 September to 20 October 2018. In our study prescriptions were categorized as both single drug containing prescriptions and multi drugs containing prescriptions. The aim of the project work was to rationalize the amount, and type of drug that prescribed in a prescription to patient suffering from eye problem or disease.

Physicians were not informed during the survey to avoid possible changes in their prescribing habits. All information of the prescriptions was recorded properly and accurately. These included information were number of patients, gender, prevalence of the eye disease based on both age and number of patient, class of drugs, and its frequency prescribed in the prescriptions. The age of the patients ranged from 4 years to 90 years

Statistical Analysis: Statistical analysis and related data were processed using the Microsoft Excel 2013, Microsoft Word 2013.

Results

Among the 170 collected prescriptions the highest number of patients suffered from eye disease was 36 and their age ranged from 21-30 years, and 31-40 years (Table 1). The number of patients in age group 1–10 years were 6 and in age group 10-20 years it was 10 but when it went to 10-20 and 20-30 years the number significantly increased to 36 and further decreased when the age was increased. Surprisingly, the number of patient drastically decreased to only 4 patients both in the age group of 70-80 years, and 80-90 years. Table 1 also showed that total 88 male patients and total 82 female patients came to hospital for treatment of eye disease.

As per the result showed in the figure 1, we found that the highest number of the patient suffered from allergic conjunctivitis and it was 34.12%. Here in our survey the second highest percentage we found that 23.53% patient suffered from eye allergy and allergic inflammation. 8.23% of the patient people suffered from dry eye syndrome. The percentage of cataract was 7.05% among all the prescriptions we collected in the survey. 9.42% patient also suffered from eye pain and swelling as well as 5.89% patient found suffered from fungal keratitis. Around 10.59% patient came to the hospital suffered from glaucoma. 7.05% also went to ocular hypertension; and around 7.05% of patient prescribed for redness of the eye (Figure 1).

The assessment of disease percentage was done based on the number of patient who visited the hospital for treatment of the eye disease. According

to the results the highest percentage for allergic conjunctivitis was seen in the age group of 20–30 years where the percentage was 56.56% (Figure 2). The second highest prevalence of allergic conjunctivitis was seen in the group of 10–20 years. In case of eye allergy and allergic inflammation, all the patients in the age group of 1-10 years was suffered from this disease and around 60% patient in the age group of 10–20 years also suffered from eye allergy and allergic inflammation. Total 8 patients belonged to the age groups of 70-80, and 80-90 years where every patient suffered from cataract and that's why the percentage for these two groups claimed to 100%. 16.67% patient was seen suffered from dry eye syndrome whose age were 20–30 years. The highest percentage for glaucoma was seen in the age group of 50-60 years whereas the percentage was also high in the age group of 60–70 years and 40-50 years patients. The highest percentage for viral infection was around 11.12% and was seen in the age group of 20-30 years. The highest percentage for eye pain and swelling was 33.34% and was seen in the age group of 1–10 years. For fungal keratitis, the highest percentage was 30% and found in this age group of 50–60 years and like viral infection this eye disease was also high in the adult age groups patients. For optic neuritis and blepharitis, the highest percentage was seen in the age group of 30–40 years. For ocular hypertension the highest percentage (21.43%) was seen in this age group of 60–70 years. 15.38% patient suffered from fungal conjunctivitis and was seen the age group of 40–50 years. The highest percentage for bacterial ocular infection was 20% and was seen in the age group of 10–20 years.

Figure 3 clearly indicated that the highest percentage prescribed to patient was two medicines and the percentage was 33%. 31% patient were prescribed total three medicines. 15% patient was prescribed total four medicines and 11% patient was prescribed total five medicines in a single prescription. Only 10% patient were prescribed single medicine.

Figure 4 demonstrated that antibiotic was prescribed to highest number of patients. 32% patient was prescribed different types of antibiotic where ciprofloxacin was prescribed to the highest number of patients. The second highest percentage prescribed to the patients was antihistamine. Total 10% patient was prescribed different types of antifungal medicines. 5% patient was prescribed for antiviral; NSAID; and analgesic medicines. Total 15% patient was prescribed others medicine that was not classified in our survey.

Among antibiotic, ciprofloxacin was prescribed mostly and its percentage was 50% (Table 2). After ciprofloxacin, moxifloxacin was prescribed the most (32%) and chloramphenicol remained in the third position based on its prescribing percentage. Olopatadine was the highest (60%) prescribed antihistamine drug whereas loratadine, and desloratadine were prescribed at a percentage of 30%, and 10%. 80% of the prescriptions were found to be prescribed dexamethasone sodium-phosphate for viral caused eye disease. In case of antifungal drug natamycin was present in 70% of prescription.

Fluconazole was present in 30% of prescriptions and ketoconazole was prescribed in 10% prescription. Total 95% prescription was found to be prescribed paracetamol as an analgesic drug. In case of NSAID, bromofenac sodium was prescribed in 55% prescription and ketorolac in 45% prescription. About 31% patient was prescribed prednisolone acetate and 18% patient was prescribed brimonidine tartrate whereas tetrahyrazolins to 13% patient (Table 2).

Based on the results in table 3, for bacterial conjunctivitis antibiotic ciprofloxacin was prescribed to 45.45% patient and moxifloxacin to 21.21% patient. For the treatment of eye allergy and allergic inflammation antihistamine olopatadine was prescribed to half of the patients whereas loratadine and desloratadine to 28.57%, and 21.42% patient. 75% patient was prescribed paracetamol for eye pain and swelling; and 66.66% patient was prescribed dexamethasone sodium phosphate (DSP) for viral infection. Antifungal drug natamycin was prescribed for fungal keratitis to 50% of the patient.

Discussion

This finding in the table 1 gives an idea that most of people suffer from eye disease are young adult. This higher percentage in this young adults is might be the result of excessive use of smart phone; television; desktop; laptop; playing virtual game; more exposure to foreign bodies; microorganisms; diabetes retinopathy and so on. The number of patients went to the hospital from the age group of 70-80 years, and 80-90 years were very low. This may be due to lack of consciousness to old aged people about their eye disease. Besides, people here in Bangladesh think that problem in eye or eye disease is common and natural in older people as well. The number of male patients went to the hospital for eye treatment were comparatively higher than female patients and the percentage of eye disease is high in male.

The percentage for allergic conjunctivitis (34.12%) was absolutely very high because we compared the percentage with 12 other eye diseases. Approximately one-third of the population in the world is affected by some form of allergic disease and 40%–80% of the affected people suffered from ocular allergic symptoms.[17] The second most prevalent eye disease was eye allergy and allergic inflammation. The symptoms and signs of it can manifest as conjunctivitis, blepharoconjunctivitis, blepharitis, or keratoconjunctivitis and because of these the eye becomes red and itchy; besides, there occurs lacrimation and slight discharge.[18] Glaucomas are a group of progressive optic neuropathies characterized by degeneration of retinal ganglion cells which eventually resulting changes in the optic nerve head.[19] This disease was also prevalent among the patient found in our study. It represents the second cause of blindness in the world and the estimated number of patients suffering from this disease is of about 68 million, of whom about 7 million are blind and this disease is mainly classified in chronic open-angle glaucoma and chronic closed angle glaucoma.[20] Eye pain can have a variety of sources, including a foreign body

underneath the eyelid, corneal abrasion or problem unrelated to the eye but associated with its near surroundings.[21] In terms of number this disease was the fourth prevalent disease among all. Dry eye is a disorder of the tear film which occurs because of tear deficiency or excessive tear evaporation; it mainly causes damage to the interpalpebral ocular surface of the eye.[22] Dry eye is a disorder and cataract were present at the same percentage among the patients. According to WHO, cataract is the leading cause of blindness, responsible for 47.8% of blindness and resulting in 17.7 million blind people all over the world.[23] It is closely associated with aging, with exogenous and endogenous risk factors being less important where there are no preventive way for cataract, the mainstay of treatment is cataract surgery.[24] Fungal keratitis and viral infection were also present in some of the patients. Presently, fungal keratitis is one of the leading cause of ocular morbidity and it carries a significant risk in developing countries and is one of the leading causes of vision loss in those countries.[25]

From the result we found, we can say that that adult and adolescent were highly affected by allergic conjunctivitis compared to other age groups (Figure 2). Children; adolescent as well as adult aged patients were mostly affected by allergic conjunctivitis compared to other groups of patient. Allergic sensitivity, more exposure to environmental allergic materials may be the factors behind this high percentage of eye allergy and allergic inflammation in those grouped patients. It is a good sigh that no patient was found came to hospital suffered from cataract up to the age of 50 years and suffered from glaucoma up to the age group of 30–40 years. Fungal conjunctivitis was found only in the age group of 40–50 years. From the overall results, it can be said that in case of cataract; and redness of the eye the percentages were the highest compared to other disease types in both 70–80 years and 80–90 years age group. Cataract is a critical condition of eye and may cause serious damage to eye requiring instant treatment whereas redness of the eye can be identified very easily for any patient. For these reasons, despite lack of consciousness about older people for their eye treatment, they are taken to the hospital.

The use of multiple medicines, commonly known as polypharmacy is mostly common in the older population with multimorbidity, as one or more medicines may be used to treat each condition.[26] The most troublesome consequence of polypharmacy is the occurrence of adverse drug reactions (ADRs), but increased drug costs and patient quality of life are also significant issues in case polypharmacy.[27] The lower the number of medicine, lower the occurrence of ADRs, side effects will be. Prevalence of polypharmacy was high in the prescription (Figure 3) and the doctor or registered pharmacist should always try to ensure rational use of medicine to every patient to overcome those troubles.

To treat the most common type of infection anti-infective such as antibiotics, antiseptics, antifungals, or antivirals can be used depending on the type of

infection.[28] Ocular infections may be caused by bacteria, fungi, parasites, or viruses and it is usually a difficult task to determine the causative agent based on clinical features.[29] In case of allergic symptoms of eye, avoid rubbing the eyes, to use artificial tears as needed, to apply cold compresses, to limit, and to avoid exposure to known allergens are advised to the patient.[30] Different types of fungi and parasites affect the eye either by direct introduction through trauma or surgery, by contact from infected adjacent tissues, or by hematogenous dissemination to the eye.[31]

In most of the cases of eye disease, antibiotic was prescribed at the highest rate compared to other class of drugs (Table 2). Although the use of antibiotic at this rate may have the possibility to cause antibiotic resistance but the use of ciprofloxacin in most of the patients compared with other higher generations of fluoroquinolone is a positive sign. Use of natamycin for fungal keratitis is highly efficacious because natamycin has been regarded as the most effective agent in the treatment of fungal keratitis.[32]

Treatment for bacterial conjunctivitis with lower generation of antibiotic rather than higher generation is of course a good practice for overcoming the danger of antibiotic resistance (Table 3). The use of natamycin for fungal keratitis is another good practice because it has been regarded as the most effective agent in the treatment of fungal keratitis.[32]

Conclusion

From the overall study and based on the results we can easily say that allergic conjunctivitis; eye allergy and allergic inflammation; cataract; eye pain and swelling; dry eye syndrome are the most common eye diseases in Bangladesh. Among all types of eye disease, the prevalence of allergic conjunctivitis was the highest. The prevalence of adult patient in the eye hospital for treatment was higher than other groups of patient. In case of cataract; and redness of the eye, the percentages were the highest compared to other disease types in the age group of 70–80 years and 80–90 years. It is good sign that no patient was found suffering from cataract and glaucoma who were children; adolescent; and young adult. Polypharmacy was also found in most of the prescription that may cause serious adverse drugs reaction, and related damages to the patient. Antibiotic was the class of drug prescribed at the highest rate whereas percentages of antihistamine; antifungal; and non-classified medicine were also high. The use of antibiotic at a rate like this is a dangerous sign that may cause antibiotic resistance at any time.

Awareness of the people about common eye diseases and their treatment can play a vital role in encouraging people to take timely appropriate eye care and can therefore may help in reducing the burden of visual impairment. Besides, the doctor should be sincere about rational use of drugs. Whatever the eye's problem it is, whether he/she is young or old requires immediate and proper treatment to save this essential part of body.

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Table 1: Number of patient according to age and gender

Age(year)	Number of Patient
1–10	6
10-20	10
20-30	36
30-40	36
40-50	26
50-60	20
60-70	28
70-80	4
80-90	4
Gender	
Male	88
Female	82

Figure 1: Percentage of number of patient according to disease

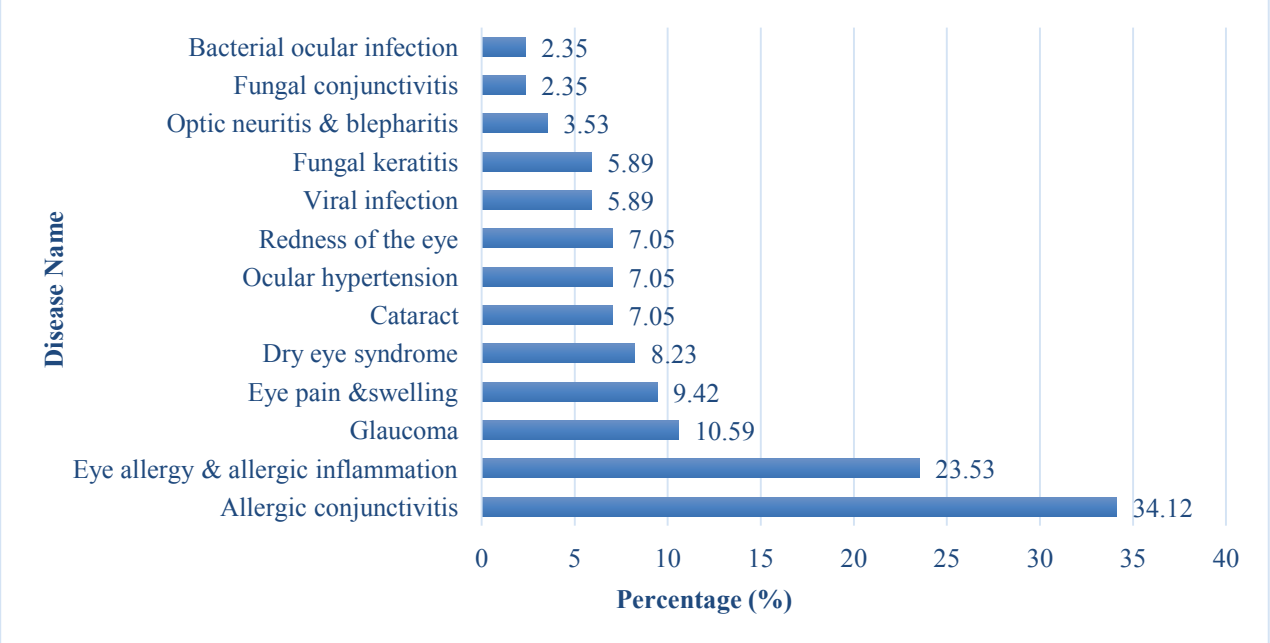

Figure 2: Prevalence of disease based on patient age

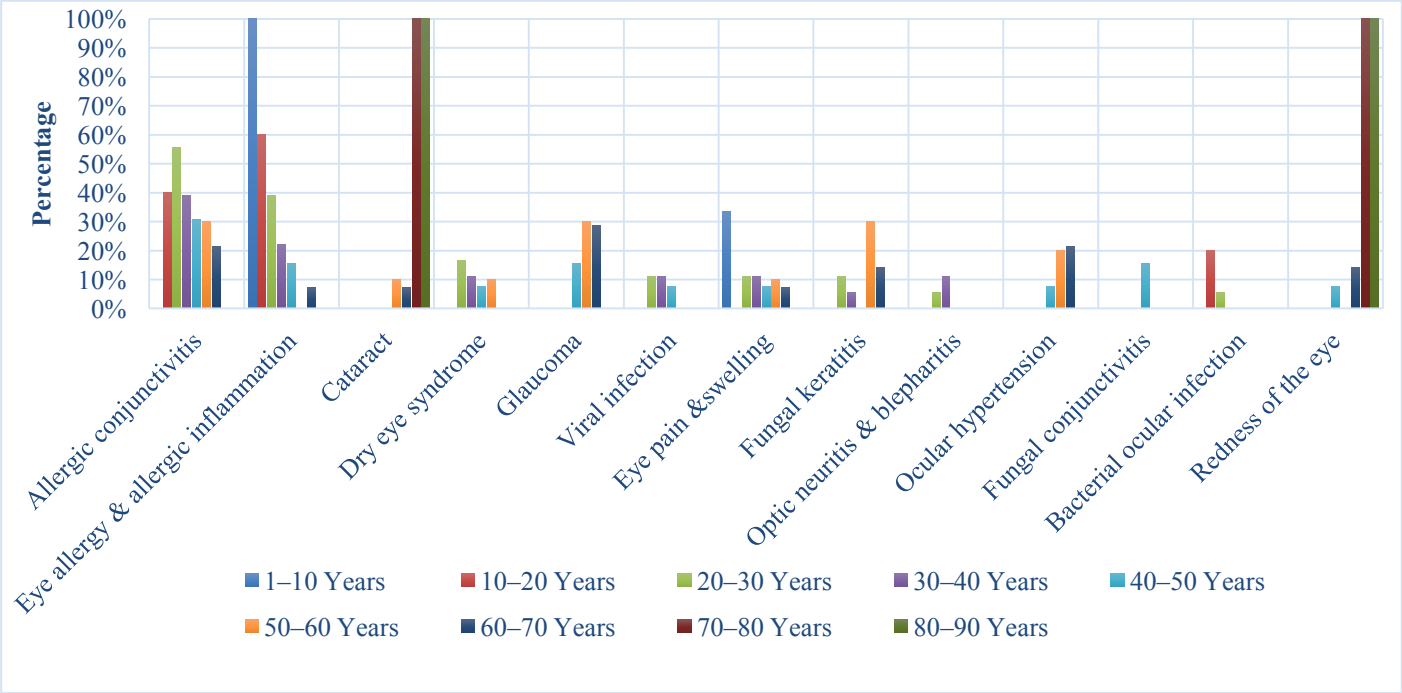

Figure 3: Percentage of number of drug present in the prescription

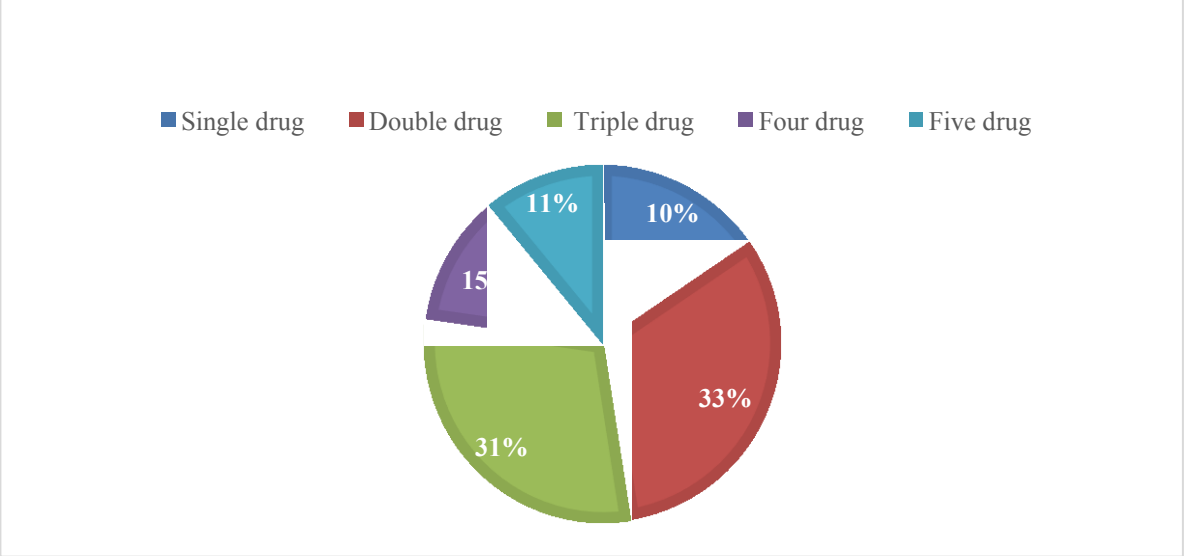

Figure 4: The class of drug prescribed to patient

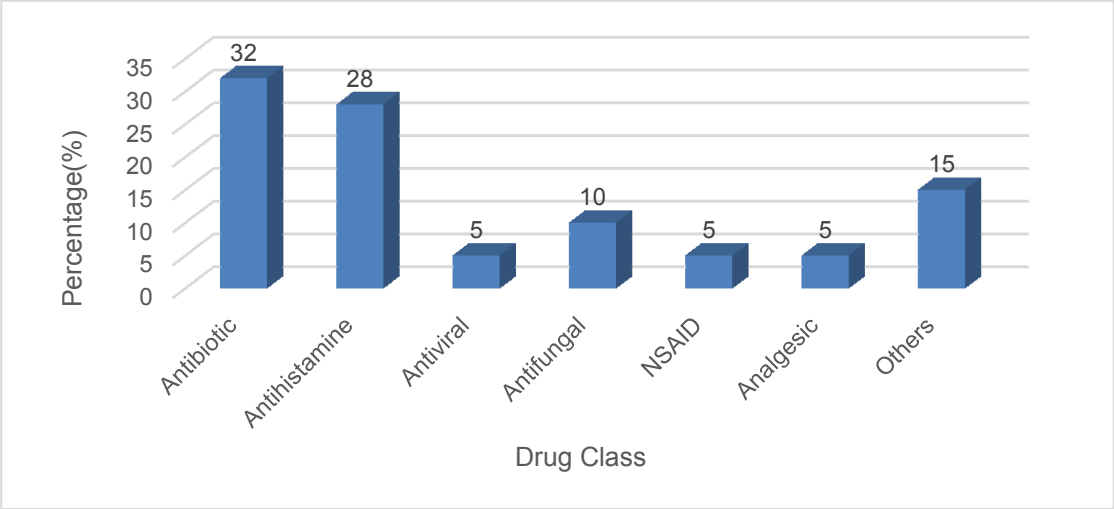

Table 2: Percentage of Drug Present in Prescription According to Their Class

Drug Class	Name & Percentage (%)					
Antibiotic	Ciprofloxacin (50%)	Moxifloxacin (32)	Chloramphenicol (15%)	Gatifloxacin (1%)	Flucloxacillin (1%)	Levofloxacin (1%)
Antihistamine	Olopatadine (60%)	Loratadine (30%)	Desloratadine (10%)			
Antiviral	Dexamethasone Sodium-phosphate (80%)	Acyclovir (20%)				
Antifungal	Natamycin (70%)	Fluconazole (20%)	Ketoconazole (10%)			
Analgesic	Paracetamol (95%)	Others (5%)				
NSAID	Bromofenac-sodium (55%)	Ketorolac (45%)				
Others	Multivitamin & Mineral (11%)	Eye tear drop (9%)	Vitamin-C (7%)	Prednisolone acetate (31%)	Brimonidine tartrate (18%)	Tetrahyrazolins (13%)

Table 3: Rate of Drug Used According to Patient and Disease

Antibiotic For Bacterial Conjunctivitis		**Antihistamine For Eye Allergy & Allergic Inflammation**		**Analgesic & NSAID Used For Eye Pain &Swelling**		**Antiviral Drug For Viral Infection**		**Antifungal Drug For Fungal Keratitis**	
Drug Name	Percentage (%)	Drug Name	Percentage (%)	Drug Name	Percentage (%)	Drug Name	Percent-age (%)	Drug Name	Percen-tage (%)
Ciprofloxacin	45.45	Olopatadine	50	Paracetamol	75	DSP	66.66	Natam-ycin	50
Moxifloxacin	21.21	Loratadine	28.57	Bromofenac-sodium	13	Acycl-ovir	33.33	Flucon-azole	25
Chloramphe ni-col	12.12	Desloratadine	21.42	Ketorolac	9			Ketoco -nazole	25
Gatifloxacin	9.09			Others	3				
Flucloxacillin	6.06								
Levofloxacin	6.06								