Prevalence and Pattern of Ocular Injuries among Ophthalmic Patients in a Referral Centre, Ekiti State, Nigeria

Olufemi, O. OYEDIRAN1*, Timothy O. OLADOSU2, Omobola K. OIWOH3, Emmanuel O. AYANDIRAN1, and Iyanuoluwa O. OJO4

1Lecturer, Department of Nursing Science, Obafemi Awolowo University, Ile-Ife, Nigeria
2Lecturer, Department of Nursing Science, Bowen University, Iwo, Nigeria
3Clinical Nurse, Department of Nursing Services, Federal Teaching Hospital Ido-Ekiti, Nigeria
4Department of Nursing, University of Ibadan, Nigeria

*Corresponding author: Olufemi O. Oyediran, Lecturer, Department of Nursing Science, Obafemi Awolowo University, Ile-Ife, Nigeria

Abstract

Ocular injuries are a leading cause of monocular loss of vision. This study aimed to determine the pattern of ocular injuries, identify the most common causes of ocular injuries, assess the pattern of treatment and determine the rate of complications of ocular injuries in Federal Teaching Hospital, Ido-Ekiti, Ekiti State.

A retrospective study was conducted in FTH, Ido-Ekiti, Ekiti State. All patients with ocular injuries from January 2014 to June 2019 were used with a total of 616 patients. Data were obtained with the use of checklist and was analyzed using statistical package of social sciences (SPSS) version 20.0 while descriptive and inferential statistics like frequency distribution, charts and chi-square correlation were used to present the data.

The mean age of the respondents 22.34 ± 2.34 and the prevalence was higher among adults while the common causes identified by the patients were occupational activities, herbal medications, assault/abuse, writing materials, broom sticks and road traffic accident. Corneal scar (29.9%) was the most common complications and there was no significant relationship between the mode of treatment and rate of complications (p = 0.430).

The study concluded that male had higher prevalence of ocular injuries than female. Prevalence of ocular injuries was higher in adult than children and occupational activities were identified to be the most common causes of ocular injuries.

Keywords

Prevalence, Pattern, Ocular injuries; Ophthalmic patients, Nigeria

Introduction

Injuries remain a common problem in the world, occurring in both developing and developed countries. Although injuries accounts for 12% of the global disease burden, about 90% of the global injury burden occurs in the developing countries [1]. Nigeria as a developing nation has a high magnitude of injuries which is only surpassed by the burden of poverty and infectious diseases [2], with a prevalence rate ranging between 24.3% and 31.1% [1,3].

The eyes are the window to the human body representing only 0.27% of the total body surface area and 4% of the facial area, yet it is the third most common organ affected by injuries after the hands and feet [4,5]. Ocular injuries are a preventable public health problem globally with a significant socioeconomic impact. It is responsible for total blindness and monocular blindness in 1.6 million people and 19 million people respectively globally [5,6].

In sub-Saharan Africa however, ocular injuries have been recorded as a singular cause of 3.2%-5.5% of bilateral blindness and 20%-50% of monocular blindness cases [7]. While the pattern and epidemiological characteristics of ocular injuries differs across the country, the visual prognosis depend on the type and nature of the causative agent of the injury, the immediate interventions, financial strength and ability, the time interval between the occurrence and commencement of treatment in
the hospital, the management protocol instituted in the hospital [8,9]. Certain occupations, school accidents, domestic accidents and cultural practices have been reported to have direct link with some peculiar ocular injuries in Nigeria [9,10].

This study retrospectively reviews ocular injuries seen at Federal Teaching Hospital, Ido-Ekiti, Ekiti over a 5-year period and determines the pattern, commonly affected and the most common cause, including pattern of treatment and rate of complications.

### Methods

A retrospective study was conducted in FTH, Ido-Ekiti, Ekiti State to evaluate the prevalence of all cases of ocular injuries. Medical records of all patients who received eye care at the Ophthalmic Complex of the hospital from January 2014 to June 2019 who were fitting our criteria were reviewed. A total of 616 cases of ocular injuries were recorded and retrieved. The record department was approached after due process and protocols were observed, with an assurance that the collected data will be used only for the purpose of the research.

A checklist that was developed from an extensive review of relevant literature was used for data collection. Content and face validity of the instrument was ensured. Reliability was obtained using test-retest method by reviewing the case notes of 30 cases of ocular injury in a similar setting, where a reliability coefficient of 0.70 was obtained.

Permission was obtained from the Chief Medical Advisory Committee of the Hospital and ethical approval was also obtained from Human Research and Ethics Committee of FTH, Ido-Ekiti with the approval number ERC/2020/01/08/321A. All the information was kept confidential, and no individual identifiers were collected. The collected data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 20.0 (Armonk, NY: IBM Corp). Results were presented using percentages, frequency and tables.

### Results

Table 1 shows the socio-demographic characteristics of patients with ocular injuries in FTH, Ido-Ekiti. 57.8% were females while about half (49%) of the population were married. More than half of the population (51.8%) had a history of use of herbal treatment. Most of the patients were artisan 172 (28.0%), students 123 (19.9%) and traders 87 (14.1%).

![Figure 1](image-url) shows the prevalence of ocular injuries among respondents. In 2014 the prevalence of ocular injuries among adult affected was substantially high at 21.2% while in 2015 drop marginally by few percentages. However, in 2016 further dropped to 15.3% and in 2017 the prevalence among adult affected went back up after which in 2018 and 2019 the prevalence dropped drastically. Inherently, the prevalence of ocular among children as at 2014 was substantially high even against adult.

Table 2 shows month-wise distribution of the occurrence of ocular injuries. A bimodal distribution of the occurrence of ocular injuries was observed with the first spike between January and March and the second between October and December. Year 2014 recorded the highest occurrence of ocular injuries.

Table 3 shows the common causes of ocular injuries.

| Variables                    | Frequency (n = 616) | Percentage (100%) |
|------------------------------|--------------------|-------------------|
| Age (years)                  |                    |                   |
| 1-10                         | 58                 | 9.4               |
| 11-19                        | 126                | 20.5              |
| 20-29                        | 134                | 21.8              |
| 30-39                        | 164                | 26.6              |
| 40-49                        | 103                | 16.7              |
| 50-59                        | 16                 | 2.6               |
| 60 and above                 | 15                 | 2.4               |
| Sex                          |                    |                   |
| Male                         | 386                | 42.2              |
| Female                       | 230                | 57.8              |
| Religion                     |                    |                   |
| Christian                    | 359                | 58.3              |
| Muslim                       | 255                | 41.4              |
| Others                       | 2                  | 0.3               |
| Highest level of education   |                    |                   |
| No formal education          | 10                 | 1.6               |
| Primary education            | 176                | 28.6              |
| Secondary education          | 254                | 41.2              |
| Tertiary education           | 176                | 28.6              |
| Marital Status               |                    |                   |
| Single                       | 279                | 45.3              |
| Married                      | 302                | 49.0              |
| Divorced                     | 7                  | 1.1               |
| Widow/widower                | 16                 | 2.6               |
| Separated                    | 12                 | 1.9               |
| Occupation                   |                    |                   |
| Student                      | 123                | 19.9              |
| Civil servant                | 67                 | 10.9              |
| Trader                       | 87                 | 14.1              |
| Artisan                      | 172                | 28.0              |
| Business                     | 81                 | 13.1              |
| Unemployed                   | 86                 | 14.0              |
| Ethnicity                    |                    |                   |
| Yoruba                       | 424                | 68.8              |
| Igbo                         | 133                | 21.6              |
| Hausa                        | 59                 | 9.6               |
| History of herbal treatment  |                    |                   |
| Yes                          | 319                | 51.8              |
| No                           | 297                | 48.2              |
Table 2: Month-wise distribution of occurrence of ocular injuries.

| S/N | Variables               | 2014   | 2015   | 2016   | 2017   | 2018   | 2019   | Total |
|-----|-------------------------|--------|--------|--------|--------|--------|--------|-------|
| 1   | January                 | 15(23.4) | 13(20.3) | 10(15.6) | 7(10.9) | 10(15.6) | 9(14.1) | 64    |
| 2   | February                | 13(21.7) | 10(16.7) | 11(18.3) | 10(16.7) | 8(13.3) | 8(13.3) | 60    |
| 3   | March                   | 16(23.2) | 14(20.3) | 8(11.6) | 10(14.5) | 15(21.7) | 6(8.7) | 69    |
| 4   | April                   | 6(14.3) | 10(23.8) | 6(14.3) | 8(19) | 4(9.5) | 8(19) | 42    |
| 5   | May                     | 8(19.5) | 7(17.1) | 2(4.9) | 7(17.1) | 7(17.1) | 10(24.4) | 41    |
| 6   | June                    | 15(25.9) | 9(15.5) | 6(10.3) | 5(8.6) | 10(17.2) | 13(22.4) | 58    |
| 7   | July                    | 6(21.4) | 4(14.3) | 5(17.9) | 6(21.4) | 7(25) | -(0) | 28    |
| 8   | August                  | 6(15) | 10(25) | 9(22.5) | 10(25) | 5(12.5) | -(0) | 40    |
| 9   | September               | 5(11.9) | 12(28.6) | 12(28.6) | 8(19) | 5(11.9) | -(0) | 42    |
| 10  | October                 | 14(24.6) | 16(28.1) | 12(21.1) | 3(5.3) | 12(21.1) | -(0) | 57    |
| 11  | November                | 17(27.9) | 10(16.4) | 16(26.2) | 10(16.4) | 8(13.1) | -(0) | 61    |
| 12  | December                | 12(22.2) | 9(16.7) | 9(16.7) | 11(20.4) | 13(24.1) | -(0) | 54    |
| 13  | Total                   | 133    | 124    | 106    | 95    | 104    | 54    | 616   |

Table 3: Common causes of ocular injuries.

| S/N | Variables                  | 2014   | 2015   | 2016   | 2017   | 2018   | 2019   | Total |
|-----|----------------------------|--------|--------|--------|--------|--------|--------|-------|
| 1   | Broken Plates/Glasses      | 4(16.7) | 7(29.2) | 2(8.3) | 6(25) | 5(20.8) | 0(0) | 24    |
| 2   | Broom Sticks               | 17(23) | 14(18.9) | 10(13.5) | 11(14.9) | 15(20.3) | 7(9.5) | 74    |
| 3   | Road Traffic Accident (RTA) | 2(4.2) | 7(14.6) | 12(25) | 6(12.5) | 18(37.5) | 3(6.3) | 48    |
| 4   | Toys                       | 7(21.2) | 3(9.1) | 10(30.3) | 7(21.2) | 2(6.1) | 4(12.1) | 33    |
| 5   | Cutleries                  | 3(16.7) | 4(22.2) | 5(27.8) | 3(16.7) | 3(16.7) | 0(0) | 18    |
| 6   | Writing materials          | 22(24.2) | 15(16.5) | 12(13.2) | 17(18.7) | 15(16.5) | 10(11) | 91    |
| 7   | Social/sport events        | 2(13.3) | 5(33.3) | 3(20) | 0(0) | 5(33.3) | 10(62.5) | 25    |
| 8   | Fight                      | 2(10.5) | 4(21.1) | 2(10.5) | 5(26.3) | 6(31.6) | 0(0) | 19    |
| 9   | Assault/Abuse              | 4(10.9) | 4(10.9) | 10(21.7) | 9(19.6) | 10(21.7) | 6(15.2) | 46    |
| 10  | Occupational activities    | 41(28.2) | 35(24.2) | 20(14.1) | 21(14.8) | 14(10.1) | 12(8.7) | 149   |
| 11  | Gun shot                   | 1(6.3) | 0(0) | 2(12.5) | 0(0) | 3(18.8) | 0(0) | 6     |
| 12  | Herbal medications         | 18(27.7) | 14(21.5) | 11(16.9) | 9(13.8) | 5(7.7) | 8(12.3) | 65    |
| 13  | Fall                       | 8(29.6) | 10(37) | 6(22.2) | 0(0) | 2(7.4) | 1(3.7) | 27    |
| 14  | Total                      | 133    | 124    | 106    | 95    | 104    | 54    | 616   |

Figure 1: Age pattern of Ocular injuries among the Respondents.
Figure 2 shows the mode of treatment of ocular injuries. Higher number of ocular injuries in 2014, 2015, 2017 and 2018 were managed by surgical intervention while majority of ocular injuries in 2016 and 2019 were managed medically.

Hypothesis Testing: There is no significance difference between mode of treatment and rate of complication. Table 5 shows that mode of treatment (surgical treatment and medical) have no influence on productivity \( t(614) = 0.626, p > 0.05 \). Furthermore, medical treatment (\( N = 387, \bar{X} = 215.18, SD = 29.15 \)) display significant higher rate of treatment of ocular than surgical treatment (\( N = 229, \bar{X} = 116.40, SD = 30.02 \)). Based on this result, there was no significant relationship between the mode of treatment and the rate of complications.

Table 4 shows the pattern of complications. In this review, corneal scar was the most common complications with 184 cases (29.9%), followed by traumatic cataract (99 cases). Imperatively, only 78 cases were with no complication.

Table 5: Significance relationship between mode of treatment and rate of complications.

| Variables          | N   | \( \bar{X} \) | SD  | Df  | t   | P-Val |
|--------------------|-----|--------------|-----|-----|-----|-------|
| Rate of complication |     |              |     |     |     |       |
| Surgical treatment | 229 | 116.40       | 30.02| 614 | 0.626| 0.430 |
| Medical treatment  | 387 | 215.18       | 29.15|     |     |       |

\( t (216) = 0.626, p > 0.05 \)
**Discussion**

This study revealed that male 386 (62.7%) had higher prevalence of ocular injuries than their female 230 (37.3%) counterparts with a ratio of 1:7.1. The predominance of males to ocular injuries is similar to report of other studies, such as 1:7:1 in pediatrics and 1:23:1 in geriatrics in Aba State, Nigeria (10); 5:1:1 in Zamfara State, Nigeria (6); 3:4:1 in Ondo State, Nigeria (5). This higher frequency of male gender could be as a result of the adventurous and aggressive nature of male to female gender and the propensity of males to get involve in risky occupational activities.

The occurrence of ocular injuries recorded higher frequency between 11 and 49 years, constituting 85.6% of the subjects. These were the young and active age group and are of great concern as it comprises the active working age group who drives the economy of the society. Our findings were similar to what was reported in other studies [5,6]. The predominance of Yorubas and Christians in this study is a reflection of the predominance in the community. More than half of the respondents (51.8%) had herbal treatment history and majority of the respondents were artisan. This may not be unconnected with the study center which although is a tertiary healthcare facility with referrals from lower cadres of healthcare, is situated in a rural area.

There seem to be a close distribution of ocular injuries across the months of the year. The highest distribution of ocular injuries was found in the month of March with 69 cases which constitutes 11.2% of the total cases. The first quarter (containing January, February and March) had the highest spike with 193 cases with 31.3% of the total cases. Months in the dry season (November-March) appears to having higher occurrences of ocular injuries but actually shared 50% of the distribution, despite having fewer months than the rainy season.

This result is in contrast with a similar result in Northern India who reported a bimodal distribution with first spike between April and June and second between August and October [11]. The year 2014 had the highest occurrence of ocular injuries in the hospital. This finding may be attributed to the fact that the gubernatorial elections in the State in the year.

About a quarter (26.6%) of the patients seen with ocular injuries were in the 30-39 year’s age group followed by 20-29 years age group (21.8%) and 11-19 years age group (20.5%). This is in keeping with a report of other studies [12] where 243 (64.5%) receive medical treatment only and nearly 50% of patients were medically treated respectively. Corneal scar was the most common complications in the years under review, which account for 184 (29.9%) cases. This is similar to the report of review of ocular trauma in a neighboring country, Ghana where 30% of the cases had corneal opacities/scars following medical interventions following ocular injuries [12]. In this study, only 78 (12.7%) cases were successfully managed without complication, this is at variance with the result of Maurya, et al. where 79.4% of the cases were successfully managed [11]. It is worthy of note that there was no significant relationship between the mode of treatment and rate of complications (p = 0.430).

**Conclusion**

The study concluded that male had higher prevalence of ocular injuries than female and ocular injuries were higher in adult than children with occupational activities; broken plates or glasses; broom; RTS; toys; cutleries; writing materials; social or sport events; fight; assault or abuse; gunshot; herbal medications as the common causes of ocular injuries. Therefore, there is a need to urgently arrest the alarming increase of ocular injuries by ensuring the use of safety devices like goggles, gloves, etc and also promote occupational safety practices.

**Funding**

The study was funded and sponsored by the researchers.

**Acknowledgement**

The efforts of the staff at the health information department of the hospital and the statistician are hereby acknowledged.

**Conflict of Interest**

No any form of conflict of interest regarding this manuscript.

**Authors Contribution**

Olufemi, O. OYEDIRAN: Involved in study conceptualization/design, data collection and drafting of the manuscript.
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