

Analysis of Patient Flow and Workload in the Emergency Service of an Apex Tertiary Care Ophthalmic Sciences Center in India

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ABSTRACT

The emergency service is vital for healthcare system in any hospital. We seldom find emergency service that specifically deals in ophthalmic sciences. This study was conducted to analyze the process flow and the workload of patients in the emergency service of a tertiary care ophthalmic center.

Aim: To study the workload and profile of patients visiting casualty of Dr Rajendra Prasad Centre for Ophthalmic Sciences (RPC), AIIMS, New Delhi.

Objectives:

- To study the process flow and workload of patients visiting casualty of Dr Rajendra Prasad Centre for Ophthalmic Sciences, AIIMS, New Delhi.
- To analyze the profile of patients visiting casualty of Dr Rajendra Prasad Centre for Ophthalmic Sciences, AIIMS, New Delhi.

Materials and methods: A descriptive, cross-sectional, and observational study was carried out for a period of 95 days from December 26, 2017 to March 31, 2018. The medical emergency records were reviewed for a period of 30 days from January 15 to February 15, 2018. The study employed fieldwork case study approach analyzing the triage processes and work practices of clinicians and nonclinicians in delivery of the ophthalmic emergency care. The workflow in casualty was studied and the data were collected using both computerized and paper-based records and forms apart from nonparticipant observations and informal interviews of the staff.

- Inclusion criteria: All the patients entering the casualty irrespective of the seriousness of condition or registration done either at the admission counter or ophthalmic outpatient department (OPD) or walk-in patients.
- Exclusion criteria: Patients not documented in any form or duplicate records.
- Data analysis: Done by the Statistical Package for Social Science (SPSS) software.

Observations and results: A total of 1,700 patients had visited the ophthalmic from January 15 to February 15, 2018. Out of this, 54.21% were registered under casualty registration. Whereas rest (44.03%) were registered in OPD and 1.77% were unregistered and improperly documented cases. The most important finding was that 71.86% patients of the Red Triage category belonged to age group 0–15 years. It was found that 36.76% patients were Green Triage patients belonging to different age groups. It was also observed that 64.18% of the males had attended the ophthalmic casualty and 35.82% female patients belonging to different age groups. About 99.24% cases coming to ophthalmic emergency were non-medicolegal cases (non-MLCs).

Conclusion: It was observed that nonemergency patients accounted for maximum workload in ophthalmic emergency. Certain issues during documentation increased the waiting time of the patient in the admission process. The double entry system used by the nurses, initial manual entry in procedure book and later in HIS, leads to prolonged waiting time of patients. Waiting time of casualty patients also prolonged in emergency due to incoming OPD patients and unregistered patients.

Keywords: Emergency, Ophthalmic casualty, Patient workload.

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INTRODUCTION

As the hospital developed as an organization, various forms of emergency services started emerging. The concept of having separate emergency services can be attributed to a vast increase in accident cases and medical emergencies. Realization of this problem by the doctors and consciousness among the community had been significant contributory factors for establishment of emergency services.¹

In many developed countries of the world, the emergency services of hospitals have been coordinated and emergency services systems have been developed, which impart treatment right from the place of occurrence (accident site/home) by trained medical personnel. This system ensures continuation of treatment on way in properly equipped ambulance and admission of patients in suitable type of specialized hospital by the speediest mode of transport. However, in India, the services have not grown

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at the same rate. Though all large hospitals particularly teaching hospitals are running proper emergency services. These services have not grown in the same proportion outside the big hospitals and there is lack of coordination in the emergency services at the city level as well as at the national level. This results in difficulty in rendering proper treatment at occurrence site, defective carriage to the hospital, and nonavailability of emergency beds in hospital.²

"Emergency" has been defined by the WHO to be "a condition determined clinically or perceived by the patient or patient's attendant, as requiring immediate medical, dental or allied services, failing which, there is a threat of loss of life or limb." The worldwide definition of emergency care traditionally implies the rapid and appropriate care of victims of traumatic and medical emergencies. The emergency service assesses and treats people with serious injuries and those in need of emergency treatment. It is open 24 hours a day, 365 days of the year. It is sometimes referred to as casualty, accident and emergency or A&E. In most of the cases, one visits the casualty only in emergencies such as loss of consciousness, a very serious state of confusion, persistent severe chest pain, or breathing difficulties.³

Now a days, increasing load of patients in the emergency department is exerting pressure on emergency beds. As such, there is an urgent need for judicious utilization of emergency beds to the optimum. This will ensure that deserving emergency cases are not denied admission for want of a bed. A certain percentage of beds should be set aside for unscheduled admission of emergency services with a reasonable assurance that bed will be available when patients arrive.⁴

Normally, hospital catchments areas are defined so that it can actually project the number of patients, who would attend the emergency. But in case of Dr Rajendra Prasad Centre for Ophthalmic Sciences (RPC), it is not defined. Not only from Delhi but patients from other states also avail this facility. To understand the need of service and further need for such facilities in other hospitals, there is a need to study the type of cases and the workload expected in ocular emergencies.

Until recently in India, the emergency ophthalmic care used to be provided by the general casualty departments (GCDs) with an ophthalmologist on call. The concept of a separate eye casualty department (ECD) is relatively new. Separate ECD was started in 1985 with five basic functional aims:

- Round the clock emergency eye services
- Attending all the corneal ulcer patients
- Glaucoma screening
- Donor eye collection
- Eye health education⁵

The RPC staff includes a junior resident, a senior resident, and a faculty member. The basic aim was to provide immediate and maximum attention to ophthalmic emergencies. This team of ophthalmologists is not burdened with routine nonemergency ocular problems like cataract, optical problems (refractive errors), etc. Further, the ophthalmologists in the outpatient department (OPD) and clinics refer all the patients who require immediate ophthalmic attention to the ECD. This system not only helps in streamlining and segregating ophthalmic emergencies from routine OPD eye problems but also the immediate treatment received reassures both the patients and their relatives.⁶

MATERIALS AND METHODS

A descriptive cross-sectional and observational study was conducted for 95 days (December 26, 2017–March 31, 2018). The study was based on the emergency records from January 15, 2018 to Feb 15, 2018. The inclusion criteria for collecting the data was that all the patients entering the casualty service irrespective of the seriousness of condition or registration done either on registration counter or ophthalmic OPD or walk-in patients were considered. This study was conducted at the casualty in Dr Rajendra Prasad Centre for Ophthalmic Sciences, AIIMS, New Delhi. The fieldwork case study approach to analyze the triage processes and work practices of clinicians and nonclinicians in delivery of the ophthalmic emergency care was followed. The data were collected using both computerized and paper-based records and forms apart from nonparticipant observation and informal interviews of the staff.

RESULTS

The most common age group of patients attending the ophthalmic emergency was above 60 years with 437 cases followed by age groups 15–30 years and 40–50 years with 355 and 255 cases, respectively (Table 1 and Fig. 1).

In ophthalmic emergency services, out of 1,700 patients, 1,687 cases (99.1%) were non-medicolegal (non-MLC) and only 13 cases (0.76%) were MLC cases (Table 2 and Fig. 2). Dr Harinder K Rai reported that common modes of injuries were metallic objects (24.2%), wooden piece (19.6%), chisel and hammer (8.3%), bows

Table 1: Age distribution of patients attending ophthalmic emergency

Age group	Frequency	Percent
0–15	199	11.71
15–30	355	20.88
30–40	219	12.88
40–50	255	15
50–60	235	13.82
>60	437	25.71

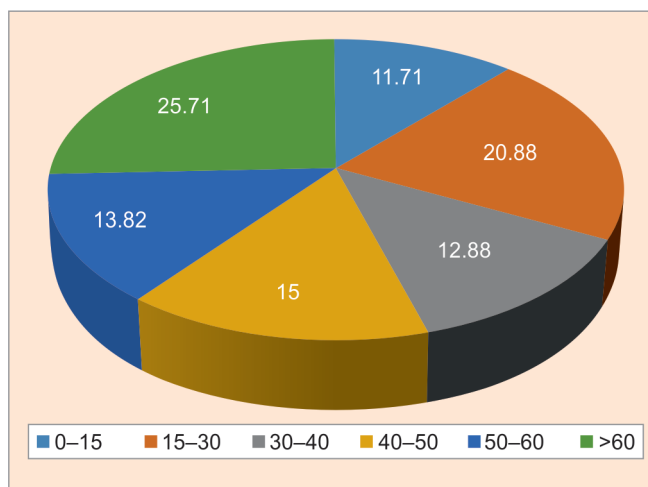


Fig. 1: Age distribution of patients attending ophthalmic emergency

Table 2: Medicolegal case (MLC) and non-MLC cases attending ophthalmic emergency

MLC status	Frequency	Percent	Cum.
MLC	13	0.76	0.76
Non-MLC	1687	99.24	100
Total	1700	100	

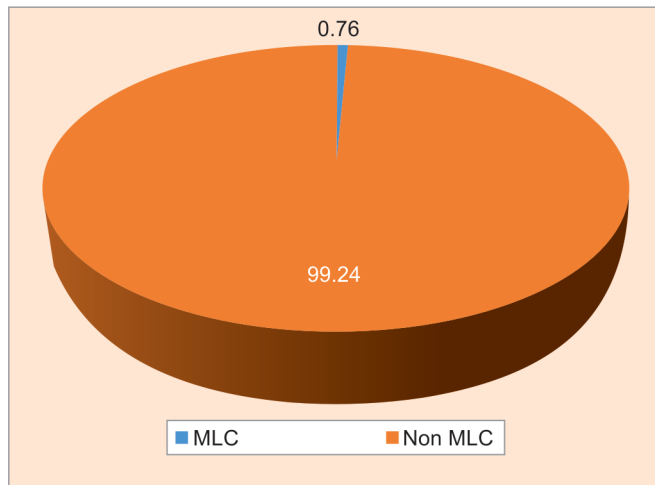
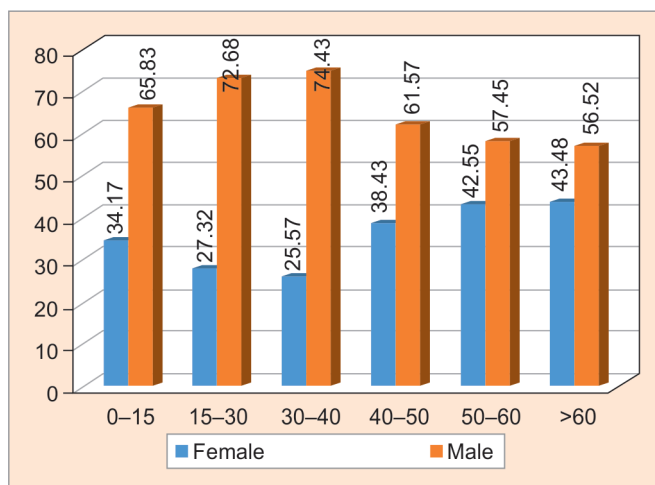

Fig. 2: Medicolegal case (MLC) and non-MLC cases attending ophthalmic emergency

Table 3: Sex distribution of patients attending the ophthalmic casualty as per the various age groups

Age group	Female	Male
0–15	34.17	65.83
15–30	27.32	72.68
30–40	25.57	74.43
40–50	38.43	61.57
50–60	42.55	57.45
>60	43.48	56.52
Total	35.82	64.18


Fig. 3: Sex distribution of patients attending the ophthalmic casualty as per the various age groups

and arrow (8.8%), fire and cracker (8.3%), pen/pencil (5.4%), and RTA (2.1%). By observation, it can be said that in case of accidents, ocular trauma was not too specific, so MLC cases were not in ophthalmic emergency.⁷

Out of the total patients visiting the eye casualty, 64.18% were males compared to 35.82% females, and the male:female ratio was 1.79:1 (Table 3 and Fig. 3). A study by Dongre in 1999 showed that 73% patients were male and 27% were female who were having ocular trauma. The male to female ratio was 2.7:1, which was relatively high.⁸

The ophthalmic emergency service is designed to cater ocular trauma patients. The study revealed that only 49.05% of the cases were registered in casualty, whereas 44.03% were OPD cases and few were even unregistered patients (1.77%) (Table 4 and Fig. 4). The 0–15 year's age group patients were mostly trauma cases. Since various tests such as the VER test and inj. mannitol were administered in casualty, so many doctors referred OPD patients to the casualty for ophthalmic tests, thereby increasing the workload of casualty. The unregistered patients usually comprise of age group 40–50 years.

The maximum number of cases were reported from national capital, Delhi (36.29%) and 60% of the workload comprised of patients from other states (Table 5 and Fig. 5).

The triaging of patients in casualty was the first step to be followed as per casualty procedure guidelines. The age group of 0–15 years had highest number of Red Triage patients (71.86%). The age group of 40–50 years had the highest number of patients

Table 4: Casualty vs outpatient department (OPD) vs unregistered distribution of patients visiting ophthalmic casualty

Age group	Casualty	OPD	Unregistered
0–15	69.85	29.65	0.5
15–30	48.17	50.14	1.69
30–40	46.33	50.23	2.28
40–50	48.18	46.06	2.76
50–60	53.40	44.26	1.7
>60	57.21	41.19	1.6
Total	49.05	44.03	1.77

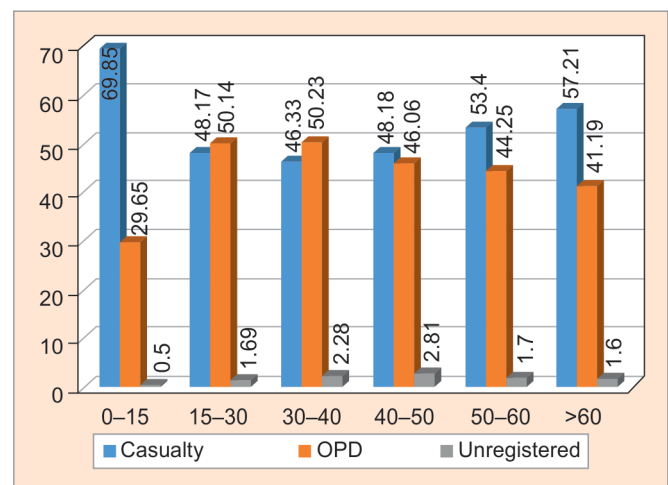
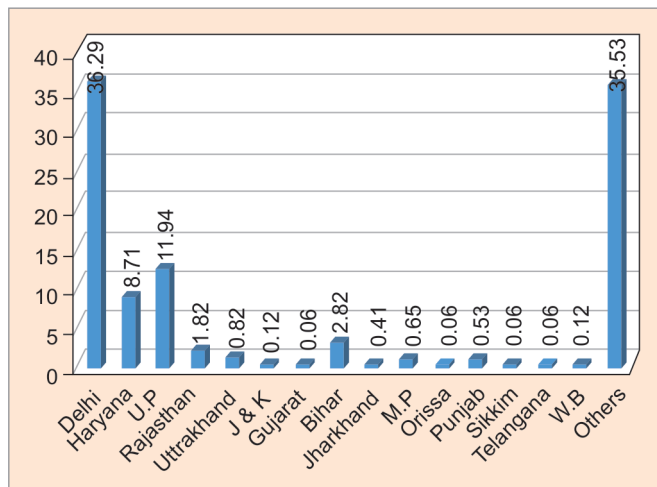

Fig. 4: Casualty vs outpatient department vs unregistered distribution of patients visiting ophthalmic casualty

Table 5: Demographic pattern of patients visiting the ophthalmic casualty

State	Frequency	Percent
Delhi	617	36.29
Haryana	148	8.71
U.P.	203	11.94
Rajasthan	31	1.82
Uttarakhand	14	0.82
J&K	2	0.12
Gujarat	1	0.06
Bihar	48	2.82
Jharkhand	7	0.41
M.P.	11	0.65
Odisha	1	0.06
Punjab	9	0.53
Sikkim	1	0.06
Telangana	1	0.06
W.B.	2	0.12
Others	604	35.53
Total	1700	100


Fig. 5: Demographic pattern of patients visiting the ophthalmic casualty

(41.96%) in the Yellow Triage category. The Green Triage category had age group 50–60 years as the highest casualty patient workload amounting to 42.98%. The cumulative data showed that 36.76% of the patients were in the Green Triage category (Table 6 and Fig. 6). Patients belonging to Green Triage were usually the OPD patients.

The study showed that the maximum number of cases (455) were from the intraocular pressure category (26.76%) (Table 7 and Fig. 7). The second most common category was the trauma patients (21%). The cornea category (13.35%) included corneal perforation, corneal abscess, and corneal hemorrhage. Out of the total patients visiting the emergency, 10.53% patients were unregistered. These patients were excluded from the study and only true emergencies cases were included irrespective of their provisional clinical diagnosis done by an ophthalmologist.

Table 6: Patient distribution of various age groups as per triage category

Age group	Red	Yellow	Green
0–15	71.86	8.04	20.1
15–30	32.11	35.77	32.11
30–40	23.74	36.07	40.18
40–50	20.78	41.96	37.25
50–60	22.13	34.89	42.98
>60	25.4	31.81	42.79
Total	30.88	32.35	36.76

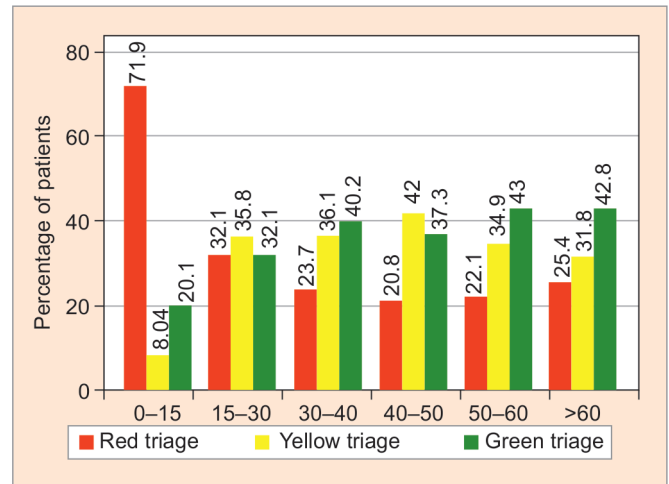

Fig. 6: Patient distribution of various age groups as per triage category

Table 7: Patients visiting casualty under various provisional diagnoses

Provisional diagnosis	Frequency	Percent
Burn injury	28	1.65
Cornea	227	13.35
Cataract	25	1.47
Conjunctiva	78	4.59
Eyelid	72	4.24
Epithelial defect	37	2.18
Foreign body sensation	35	2.06
Glaucoma	90	5.29
Globe injury	19	1.12
Iritis	18	1.06
Intraocular pressure	455	26.76
Loss of vision	54	3.18
Retina	42	2.47
Sclera	10	0.59
Trauma	357	21.00
Others	153	9.00

DISCUSSION

The objective of the study was to analyze the workload on healthcare workers posted in the ophthalmic casualty. The profile of patients visiting the ophthalmic casualty was studied and

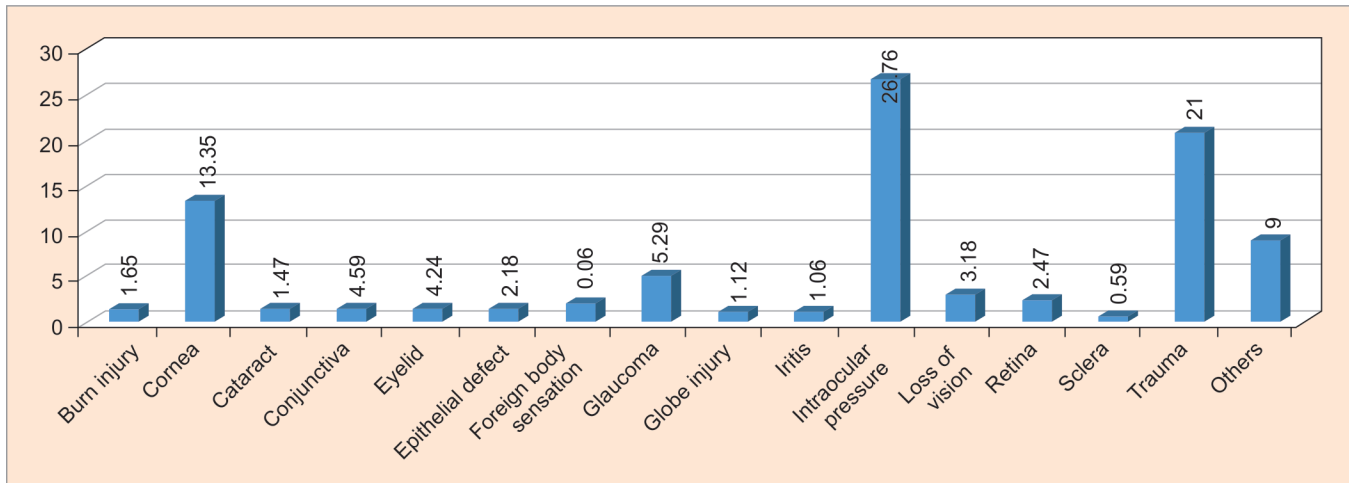


Fig. 7: Patients visiting casualty under various provisional diagnoses

informal interviews were conducted with the casualty medical officers (CMOs), assistant nursing superintendent (ANS), and deputy nursing superintendent (DNS) in charge along with the other workers posted in ophthalmic casualty to make recommendations for improving the services. Patient's demographic data, provisional diagnosis, Triage category, MLC status, and registration status were captured for analysis of data. After removing duplicate entry from database as provided by nursing informatics specialists (NISs), it was found that total of 1,700 had visited the ophthalmic casualty from January 15 to February 15, 2018. Out of this, 54.21% were registered under casualty registration. Whereas rest (44.03%) were registered in OPD and 1.77% were unregistered and improperly documented cases. Since, Dr R. P. Centre, AIIMS, is the only hospital that has the ophthalmic casualty, many private clinics and hospitals referred the serious cases to RPC after providing them first aid. Although it was found that no specific records were available regarding the referred patients but informal interview with the CMO and DNS in charge revealed that there is need for setting up more ophthalmic emergency services in other hospitals. Where the most important finding revealed that 71.86% patients of Red Triage category belonged to age group 0–15 years. It was found that 36.76% patients were Green Triage patients irrespective of their age group. It was seen that 64.18% of the males had attended the ophthalmic casualty in comparison to 35.82% of females irrespective of the age group distribution. About 99.24% cases coming to ophthalmic emergency were non-MLC cases. Despite being an age group prone to injuries, in 0–15 years only 11.71% cases were reported to eye casualty.

CONCLUSION

It was observed that nonemergency patients accounted for maximum workload in ophthalmic emergency. Certain errors

in documentation were found. The issue during documentation that increased the waiting time of the patient in the admission process was the double entry system used by the nurses to make manual entry in the procedure book and then enter the details in the hospital information system (HIS). Waiting time of casualty patients in emergency also prolonged due to incoming OPD patients and unregistered patients. It was recommended to follow a proper triaging system to effectively reduce Green patients and thereby reducing waiting time for Red category patients.

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