

# Profile of ocular emergencies in a tertiary hospital from Northeast of Brazil

## *Perfil das emergências oculares em um hospital terciário do Nordeste do Brasil*

Paulo de Tarso Ponte Pierre Filho<sup>1</sup>, Paulo Rogers Parente Gomes<sup>2</sup>, Érika Teles Linhares Pierre<sup>3</sup>, Felisberto Bastos Pinheiro Neto<sup>4</sup>

### ABSTRACT

**Purpose:** To evaluate the profile of all the visits to the ophthalmic emergency service at a tertiary hospital in the city of Sobral, Ceará, northeast of Brazil. **Methods:** A survey was carried out of all patients attended at ophthalmology emergency service of the department of ophthalmology of Santa Casa of Sobral, during the period between may and october 2008. Data on patient's age, sex, level of education, residential address, health insurance status, average distance to our service, time between the initial symptoms and first visit to the hospital, site of medical evaluation indication, diagnosis, and veracity of emergency indication. All these data were collected during interview and ophthalmological examination. **Results:** A total number of 1,024 patients were analyzed in the study. Mean and standard deviation to age was  $31.5 \pm 17.1$  years (ranging from zero to 81). Sixty-five per cent of the patients were male and 35% female. Twenty-one per cent of the patients lived at least 50 kilometers away from the Santa Casa of Sobral. Ocular traumas (40.9%) of any nature were the most frequent occurrence, followed by infections (29%). About 45 % of cases were not considered as a true emergency and could be managed in primary or secondary health care centers. About the initial symptoms and first visit to the hospital, only 24% of the patients went to the ophthalmology emergency room on the same day in which their symptoms started. **Conclusion:** A great number of patients attended or treated at the ophthalmology emergency service of Santa Casa of Sobral presented with common ocular disorders of simple resolution. Therefore there is a failure in the primary and secondary health care to manage it. Certainly a considerable proportion of these patients had conditions which could have been diagnosed and treated in an ophthalmic outpatient clinic or by general practitioners.

**Keywords:** Eye diseases/epidemiology; Ocular emergency; Emergency service, hospital; Ocular trauma

<sup>1</sup> Médico oftalmologista da Santa Casa de Sobral – Sobral (CE) – Brasil;

<sup>2</sup> Médico oftalmologista da Santa Casa de Sobral – Sobral (CE) – Brasil;

<sup>3</sup> Farmacêutica, especialista em Saúde da Família pela Escola de Saúde da Família Visconde de Sabóia – Sobral (CE) - Brasil;

<sup>4</sup> Médico oftalmologista da Santa Casa de Sobral – Sobral (CE) – Brasil.

Trabalho realizado no Instituto da Visão – Santa Casa de Sobral – Sobral (CE) – Brasil.

Recebido para publicação em: 26/2/2009 - Aceito para publicação em 8/11/2009

## INTRODUCTION

**E**ye injury, infections, tumors, retinal detachment and uveitis are among the most common ocular emergencies seen in the emergency room.<sup>(1)</sup> Careful examination and appropriate treatment are important factors because ocular emergencies may have a poor visual prognosis, resulting in loss of an eye or blindness.

Acute ophthalmological processes have varying degrees of severity and are handled patients in very different ways. Some tend towards self-medication or simply to request drugs in the drugstore, while others ask for general practitioner or ophthalmology consultations<sup>(1,2)</sup>.

Emergency areas have traditionally provided care to anyone requesting it, including patients with non-urgent complaints. The inappropriate use of these services makes it difficult to guarantee access for real emergency cases, decreases the readiness for care, produces negative run over effects on the quality of emergency services, and raises overall costs.<sup>(3-5)</sup> Patients frequently underestimate the importance of continuous care, and they often lack the knowledge that their decision to seek emergency services may result in the excessive use of medicines and diagnostic tests<sup>(4)</sup>.

In Brazil, medical doctors of emergency room must examine all people who look for care, independent of their financial status, ethnicity, insurance status, or special needs. The policy is that emergency care is patient-demanded, and a patient visiting emergency department is seriously ill until proven otherwise.<sup>(6)</sup> Studies of urgency in the emergency department have found 5%<sup>(7)</sup> to 82%<sup>(8)</sup> of visits to have been made for non-urgent problems. This large variation may be due in part to differences in the population being assessed or in the criteria used to define urgency<sup>(9)</sup>.

Studies describing ocular diseases from the emergency service of a department of ophthalmology are well known and have been reported all over the world<sup>(1, 10-15)</sup>. However, limited information is available in Brazil about the medical and social aspects of ophthalmic emergencies<sup>(1,2)</sup>. Information could be important in the management and planning strategies for prevention and protection of persons with such conditions. The aim of this study was, prospectively, to investigate the clinical features of ocular emergencies seen at Santa Casa of Sobral, Ceará, northeast of Brazil, and to evaluate the personal characteristics and the barriers against getting resolving ophthalmologic assistance.

## METHODS

This prospective study comprised patients seen at ophthalmological emergency service of the Department of Ophthalmology, Santa Casa of Sobral over a six-month period (may-october 2008). Santa Casa of Sobral is a tertiary and most important general hospital of the north region of the state of Ceará providing medical care to a population of 1.5 millions inhabitants from 55 cities. It is the only hospital which provides ophthalmological emergency in the region.

In the same way, patients attend the ophthalmological emergency service due to they are referred mainly by general physicians, nurses or an ophthalmologist, or also by their own decision. There they are examined by an ophthalmologist, treated if necessary and sometimes referred for other center.

Data on patient's age and sex, level of education, residential address, insurance status, average distance to our service, time to presentation (days) between the initial symptoms and first visit to the hospital, sources of referral, diagnosis, veracity of emergency were collected during interview and ophthalmological examination. When a patient had more than one diagnosis, only the most serious one was listed. Veracity of the emergency was categorized as "true" or "not-true" emergency. A true ocular emergency was considered if there were risk of decreasing or loss vision, as well as cases requiring immediate (same day) evaluation in either an emergency department or an ophthalmology outpatient department due the intensity of symptoms<sup>(1)</sup>.

The eye examination consisted of visual acuity using a Snellen chart, anterior segment examination by slit lamp, intraocular pressure measured with a Goldmann tonometer (except children aged five years or younger), and, if possible, given the condition of the eye, a posterior segment examination after pupil dilatation.

Patients who were at least 18 years of age, or who were younger than 18 but were married and no longer living with parents, provided written informed consent to participate. If a patient was younger than 18 years old, consent was obtained from at least one parent. Ethical approval (number 647) for this study was given by the Ethics Committee on Human Research of the State University Vale do Acaraú. This Ethics Committee is in agreement with the Helsinki Declaration. The SAS System release 8.01 for Windows (SAS Institute Inc, Cary, NC) was used to analyze the data. Data were presented as mean  $\pm$  standard deviation (SD) and median with range. Frequencies were reported as percentages.

## RESULTS

A total of 1,024 patients were seen. The mean age of patients was  $31.5 \pm 17.1$  years (range 0-81). Six hundred and sixty-five (65%) were males and 359 (35%) females. Six hundred and sixty-three (64.7%) were illiterate or had not finished primary school, 271 (26.5%) received primary education (6 years), 69 (6.7%) had 9–12 years middle school education, and 21 (2.1%) were college graduates or higher.

The estimated median driving distance was 24.6 km (range 0-137). Six hundred and sixty-four (approximately 66% of patients) were from Sobral and its immediate surroundings (between 0-20km), while 21% travelled more than 50 km to reach the hospital.

Self referral accounted for 43.2% (n=442/1,024) of cases. Other sources of referral were Basic Healthcare Units (36.2%) (n=371/1,024), hospitals (14.4%) (n=147/1,024), and work or school (2.4%) (n=25/1,024), optician/optometrists (0.8%) (8/1024), other (3%) (31/1,024). Most patients were either asked to return (16.7%) (171/1,024), referred to outpatients (20.3%) (208/1,024) or were discharged to general practitioner care (39.9%) (409/1,024). Few were admitted to hospital (6.8%) (70/1,024). The diagnosis was divided into 10 broad groups. Of these, the two groups of ocular trauma and infections constituted 69.9% of the patients. A further 8.9% (91 patients) formed a miscellaneous group which could not be categorized within the 9 groups (table 1).

Among the 419 (40.9%) cases of ocular trauma, there were 358 (85.4%) closed and 61 (14.6%) open. FBC (foreign body on the cornea) was the most common etiology with 222 cases (53%) among the 358 closed injuries, followed by ocular contusion, corneal abrasion, burns (thermal and chemical, conjunctival foreign body, laceration of conjunctiva and traumatic uveitis. Corneal laceration was the most common etiology with 32 cases (7.6%) among the 61 open injuries, followed by scleral laceration, corneoscleral laceration, and intraocular foreign body (IOF) (table 2).

Among the 297 cases of infections, the cases of conjunctivitis totaled 145 (48.8%) (viral, 112; allergic, 17; sicca syndrome 8; and bacterial 8); hordeolum / chalazion, 70 (23.6%); corneal ulcers (keratitis), 69 (23.2%); endophthalmitis, 7 (2.4%). Other forms of infections (orbit cellulitis, 3; dacryocystitis, 2, and herpes-zoster ophthalmicus, 1) totaled 6 (2%) (table 3).

The true emergency diagnosed cases that requiring complex and immediate treatment were the following: uveitis, corneal ulcer (keratitis), episcleritis, herpes-

Table 1

**Breakdown by diagnosis of new patients attended at ophthalmological emergency service, Santa Casa of Sobral (may-october 2008)**

Diagnosis	n	%
Trauma	419	40.9
Infections	297	29.0
No ophthalmologic diagnostic	55	5.4
Pterygium inflamed/ pingueculitis	41	4.0
Glaucoma (raised intraocular pressure)	30	2.9
Episcleritis	28	2.7
Allergic lid edema (with/without chemosis)	25	2.5
Uveitis	21	2.0
Retinal detachment	17	1.7
Miscellaneous	91	8.9
Total	1,024	100

Table 2

**Traumatic causes of ocular emergency attended at ophthalmological emergency service, Santa Casa of Sobral (may-october 2008)**

Closed injury	f	% (n=358)	% of total (n=419)
Corneal foreign body	222	62.0	53
Ocular contusion	73	20.4	17.4
Corneal abrasion	32	8.9	7.6
Burns	8	2.2	1.9
Conjunctival foreign body	6	1.7	1.4
Laceration of conjunctiva	5	1.4	1.2
Traumatic uveitis	5	1.4	1.2
Others	7	2.0	1.7
<b>Subtotal</b>	<b>358</b>	<b>100.0</b>	<b>85.4</b>
Open injury	f	% (n=61)	% of total (n=419)
Corneal laceration	33	54.1	7.9
Corneoscleral laceration	17	27.9	4.1
Scleral laceration	10	16.4	2.4
Intraocular foreign body	1	1.6	0.2
<b>Subtotal</b>	<b>61</b>	<b>100</b>	<b>14.6</b>
Total	419		100

f=frequency

zoster, dacryocystitis, orbital cellulitis, ocular trauma, detachment of retina, acute glaucoma, endophthalmitis, n=572 (55.8%) (Table 4).

Only 246 (24%) patients went to the ophthalmology emergency room on the same day in which their symptoms started, and 159 (15.5%) waited more than 5 days to go. Around 1/2 of the subjects were referred to our service by a health professional.

With respect to insurance status, 95.4% (n=977)

**Table 3**

**Patients with infections diagnostic that looked for ophthalmological emergency service of the Santa Casa of Sobral (may-october 2008)**

Diagnosis	f	%(n=297)
Viral conjunctivitis	112	37.7
Allergic conjunctivitis	17	5.7
Conjunctivitis sicca	8	2.7
Bacterial conjunctivitis	8	2.7
Hordeolum/ chalazion	70	23.6
Corneal ulcers (keratitis)	69	23.2
Endophthalmitis	7	2.4
Orbit cellulitis	3	1.0
Acute dacryocystitis	2	0.7
Herpes zoster ophthalmicus	1	0.3
Total	297	100

f=frequency

**Table 4**

**Diagnosed "true" emergency cases requiring treatment in tertiary care units – patients that looked for ophthalmological emergency service of the Santa Casa of Sobral (may-october 2008)**

Diagnosis	f	% of total (n=1,024)
Uveitis	21	2.0
Corneal ulcers (keratitis)	69	6.7
Episcleritis	28	2.7
Herpes-zoster ophthalmicus	1	0.1
Acute dacryocystitis	2	0.2
Orbital cellulitis	3	0.3
Ocular trauma	419	40.9
Detachment of retina	17	1.7
Acute glaucoma	5	0.5
Endophthalmitis	7	0.7
Total	572	55.8

f=frequency

of the patients had government insurance (SUS), which meets all the emergency department costs. The rest of the patients were self-paying. Patients whose visits were fully paid by health insurance accounted for a significantly greater number of inappropriate visits ( $p=0.042$ ).

## DISCUSSION

It is difficult to comment on the appropriateness of patient visits because measuring urgency is a difficult task. In our study, we found almost one-half of visits were inappropriate. In studies that measured inappropriate use of emergency departments, the percentage of inap-

propriate visits varied from 5% to 82%<sup>(16,17)</sup>. The most important reason for such a wide variation is the lack of standard criteria to measure appropriateness. Some studies used the physician's perception, whereas others relied on the patient's perception of the appropriateness of the visit<sup>(18)</sup>. The perception of illness by patients usually is more severe than the perception by physicians. When patients decide to go to the emergency department, they probably have defined the problem as an emergency.

With regard to primary care utilization, only 50.6% of the cases were formally referred from a primary or secondary health care facility while 43.2% presented directly to the hospital on by their own. It is clear that patients view hospitals as an important source of primary care for such problems. Patients living near the hospital tend to use the hospital as a secondary care hospital or are admitted without referral from other medical facilities. On the other hand, patients who live far from the hospital tend to use it as a tertiary hospital and are referred to the hospital from other medical facilities.

In this study, twenty-one percent of patients travelled more than 50 km to reach the hospital. The long distances increase the costs for the treatment of the diseases which should be treated locally.

In the analysis of our data, ocular trauma constitutes the single largest group, comprising a total of 40.9% patients. Ocular trauma is divided into open and closed injury. The prevalence of closed ocular injury was about six times higher than that of the open ocular injury in our study. It is currently believed that 90% of the cases of ocular trauma may be avoided, with appropriate education and preventive measures<sup>(1,11)</sup>. Acute infections of the eye and adnexa constituted the second largest group of patients (29%) attended at the ophthalmological emergency service. This is similar to other reports from Brazil<sup>(19,20)</sup>. The pattern of problems seen in general practice and hospital is different. This is illustrated by McDonnell's study<sup>(21)</sup>, where bacterial conjunctivitis was 10 times commoner than corneal abrasion and foreign body, while in our study ocular trauma was commoner than infection.

Voon et al.<sup>(22)</sup> conducted a prospective survey over a 3 month period from the emergency service of a large tertiary hospital in Singapore. They found that trauma cases represented 52.9% of all cases. The three most common types of injuries were superficial foreign body (52%), corneal abrasion (24.9%) and blunt ocular trauma (12.6%), while open globe injury occurred in only 2% cases.

Studies<sup>(1,10,14)</sup>, investigating the demand for urgency/emergency care at the hospitals, founded that a high percentage of patients with conditions have been

managed at Basic Healthcare Units and/ or secondary care units by non-ophthalmologists, suggesting a poorly structured secondary care system, concerning urgencies. This problem produces unnecessary costs for the State and difficulties for the patients, who should be treated in an expeditious way in units closer to their residence.

Inappropriate ophthalmological emergency service use was higher among those with higher income, and those with full-pay government insurance. When the government or a health insurance company pays for the charges, the number of inappropriate visits increases. When patients don't have to pay the costs by their own pocket, they don't mind about using the emergency department whenever they want, regardless of the seriousness of their condition<sup>(23,24)</sup>.

As the study was carried out during the routine work in Ophthalmological Emergency Service, amount of data collected had to be limited. The duration of our study was only six months and was thus subject to bias in the sample of eye diseases seen, owing to the epidemic and seasonal nature of common acute ophthalmic diseases.

Although the prevalence of inappropriate use reported in the literature varies<sup>(7,8)</sup>, the results of our study are comparable to studies in other settings which used the same criteria<sup>(1,2)</sup>. Inappropriate emergency department use is a common problem in various parts of the world and may result in overcrowding, inappropriate utilization of resources, decreased effectiveness of quality of care, increased cost and patient dissatisfaction<sup>(23,24)</sup>.

## CONCLUSION

The results of our study revealed that ocular trauma, followed by infections, was the most frequent etiology, and also indicate a significant prevalence of inappropriate use of the ophthalmological emergency service of the Santa Casa of Sobral. The absence of public ophthalmology centers in our region may be an important cause for attendance of non-urgent cases in our emergency service. Certainly a considerable proportion of these patients had conditions which could have been diagnosed and treated in an ophthalmic outpatient clinic or by general practitioners. Our findings are likely to be generalized to other Brazilian cities and may be useful for understanding the problem in other countries with a public health system. Further studies should be done to determine the exact impact of such a situation on the emergency department staff and institution.

## RESUMO

**Objetivo:** Avaliar o perfil dos atendimentos no serviço de emergência oftalmológica de um hospital terciário na cidade de Sobral, Ceará, nordeste do Brasil. **Métodos:** Realizou-se um estudo em todos os pacientes atendidos no serviço de emergência do departamento de oftalmologia da Santa Casa de Sobral no período entre maio e outubro de 2008. Dados sobre idade e gênero dos pacientes, nível de escolaridade, origem, distância percorrida para chegar ao hospital, seguro de saúde, período entre os sintomas iniciais e o primeiro atendimento no hospital, origem do encaminhamento, diagnóstico e veracidade da emergência foram coletados durante entrevista e exame oftalmológico. **Resultados:** Mil e vinte e quatro pacientes foram analisados no estudo. A idade média dos pacientes foi de  $31,5 \pm 17,1$  anos (variando entre zero e 81). Sessenta e cinco por cento dos pacientes pertenciam ao sexo masculino e 35% ao sexo feminino. Vinte e um por cento dos pacientes procederam de localidades distantes pelo menos 50 quilômetros da Santa Casa de Sobral. Traumas oculares (40,9%) de qualquer natureza foram a ocorrência mais comum, seguido por infecções (29%). Aproximadamente 45% dos casos não foram considerados uma emergência real e poderiam ser tratado em níveis primário e secundário de atendimento. Apenas 24% dos pacientes compareceram a emergência oftalmológica no mesmo dia do início dos sintomas. **Conclusão:** Muitos pacientes atendidos no serviço de emergência oftalmológica da Santa Casa de Sobral apresentaram doenças comuns, de simples resolução, o que pode ser reflexo de falhas na rede de atendimento primária e secundária. Certamente uma parcela destes pacientes poderia ter sido diagnosticada e tratada numa clínica oftalmológica ou por médicos gerais.

**Descritores:** Oftalmopatias/epidemiologia; Emergência ocular; Serviço hospitalar de emergência; Trauma ocular

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**Endereço para Correspondência:**

**Paulo de Tarso Ponte Pierre Filho**  
**Av. Gerardo Rangel, nº 801 - apto.1001**  
**CEP 62041-380 - Sobral - Ceará**  
**Fax: (88) 3677-1804**  
**E-mail: paulopierre@hotmail.com**