Epidemiological Profile of Otorhinolaryngological Emergencies at a Medical College, in Rural Area of Gujarat

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Abstract Otorhinolaryngological (ORL) emergencies are common in all communities and their early diagnosis and management will result in reduction in morbidity and mortality. As the horizons of otorhinolaryngology are widening, management of patients with protocol based quality care becomes prime priority. This study has been done to study the (a) Prevalence of ENT emergencies in TEC (trauma and emergency care), (b) Pattern and distribution of ENT emergencies in relation to age, sex and diagnosis, (c) Outcome in terms of disposition from TEC ward. This will help us in identifying preventive measure for some of ENT emergencies and to improve treatment protocols if required. Type of study: Cross sectional retrospective descriptive study of 1 year duration. Records of patients who attended trauma care from 1st July 2009 to 30 June 2010 were studied under various parameters like age, sex and diagnosis and outcome. Major section was of facio-maxillary trauma (84.0%) followed by foreign bodies (5.8%), then others. 145 patients were discharged from the casualty, 518 were admitted and five were expired due to causes other than ENT e.g. head or abdominal injury. Different problems, their mode of management and outcomes are discussed here. With urbanization, facio-maxillary trauma constitutes the maximum workload amongst other emergencies like foreign body, ENT infections and burns and owing to the complex anatomy of face and neck, it is need of the hour for ORL surgeons to widen their scope of cases addressed and managed in emergency wards.

Keywords Emergency · Otorhinolaryngology

Introduction

Ear, nose and throat emergencies are common in all communities. Early diagnosis and management will result in reduction of morbidity and mortality [1]. Emergency services form an integral part of health care system. Moreover in present post-graduate curriculum emergency services are one of the essential components in residency training program. Ear, nose and throat emergencies require specialized anatomical knowledge and special instruments and equipments are required to manage the situation. With the increasing incidence of road traffic accidents, industrial disasters, ENT as well as head and neck emergencies are on a rise and thus posing a challenge to the attending ENT surgeon [2].

An outpatient study suggests that there is a rise in ENT emergencies and need for ENT specialists for their appropriate management [3]. A supportive study by Bleach [4] suggests that in a general hospital the workload of ENT specialists have been on a rise as there are cases from emergency department additional to new patient referrals, routine ENT admissions, ENT surgical procedures which needs to be managed by ENT surgeons. A study from urban center in Ireland concluded that there was a noticeable lack in primary involvement of ENT fraternity in areas of facial and neck trauma [5].

A study done by Rivero et al. [6] in 2005 concluded that nasal trauma and epistaxis followed by otitis externa were the common causes of ENT emergencies and there is a growing demand for emergency attention. On the contrary, study done in 1992 at Safdarjung, New Delhi by Malhotra et al. [7] reported that most of the ENT emergencies are

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trivial and require treatment but no admission. According to Rabelo et al. [8] in 2009 post-operative nasal hemorrhage was the most common cause for epistaxis primarily as most of these patients were not referred to ENT service but managed by trauma teams.

Despite being a minor specialty, the need for ENT surgeons in casualty department other than routine OPD and referrals for appropriate and skilled management of facio-maxillary and neck injuries is indispensable. Very few studies in India have been actually carried out that would project the epidemiology of ENT emergencies in casualty.

Ours is a rural based tertiary care center where one approaches patients from various referral centers as well as patients coming in open access to the casualty department. There has been a wide variation amongst cases from diagnosis to severity, where skills are required. An on-call resident from ENT department receives referrals from pediatric to geriatric age groups concerning ENT pathologies to head and neck trauma in casualty. With the increasing flow of patients related to ENT, management of patients with protocol-based quality care becomes the prime priority. In order to act on this one needs to determine the size and distribution of ENT emergency admission at a rural base and teaching hospital like ours. We intend to obtain a baseline data by conducting the study and utilize it for upcoming subsequent studies related to patient care and outcome in ENT emergencies. This would help to identify the preventive measures for some ENT emergencies and revise the treatment protocol, as the need may be.

The literature available in the same direction consists of various lacunae [1–13] viz.

- a) Head and neck trauma is considered one of the most challenging areas in traumatology [9]. There is deficit of quantitative literature favouring the management of faciomaxillary trauma cases by otorhinolaryngologists. The literature suggests that these cases are managed by other fraternities such as plastic surgeons or oral maxillofacial surgeons of dental wing.
- b) Lack of enough data discussing the epidemiological profile of otorhinolaryngological emergencies in a set up like ours.

This study aims at filling these lacunae by:

- a) This study also includes patients with facio-maxillary trauma being attended primarily by otorhinolaryngologists which is essential as the complex anatomy of face and neck and the cosmetic implications of the area need to be addressed by a specialist of this region.
- b) We intend to put across a protocol for emergency cases and discuss the vital points that a doctor must not forget while evaluating a casualty.

- c) We also intend to put forward a numerical value of various cases of otorhinolaryngological emergencies at a rural based tertiary care center, information about which is deficient and which can be used for further references by other specialists working in similar directions.

Based on these citations, the study was aimed to determine the pattern and distribution of ENT emergencies with following objectives:

- a) To study the prevalence of ENT emergencies in TEC (trauma and emergency care)
- b) To study the pattern and distribution of ENT emergencies in relation to age, sex and diagnosis.
- c) To study the outcome in terms of disposition from TEC ward (admitted, discharged etc.)

Method

Trauma and Emergency Care department of SKH, Karamsad runs 24 h emergency services on three-tier basis-casualty medical officer (CMO), residents (junior and senior), and consultants.

It is a cross sectional, retrospective, descriptive study. Clinical records of patients admitted for ENT emergencies in Trauma and Emergency Care department (TEC) at SKH, Karamsad for the period of one year, from 1st July 2009 to 30th June 2010, were studied with respect to age, sex, diagnosis and outcome analysis.

Referrals from other departments were excluded from the study.

Results

The study conducted at SKH shows a wide variety of cases attended and managed by otorhinolaryngologists. Total 668 patients who visited Trauma and Emergency Care (TEC) ward at Shree Krishna Hospital, Karamsad, were attended by doctors from the Department of Otorhinolaryngology, Head and Neck Surgery, (ORL, HNS). The patients were managed as per a three tier system, wherein the patient was first attended by the Casualty Medical Officer (CMO) and call was given to the 1st year resident and then to the 2nd year resident. Most of the cases were managed at this level. Those patients with serious injuries were attended 3rd year residents and consultants. The patients attending TEC were managed and treated as per structured guidelines aimed at more efficient and effective management of patients attending TEC. The age range was 10 months to 89 years, with a mean age of 32 year. The male:female ratio was

2.5:1 with the mean age of males being 32.1 years and mean age of females being 30.9 years (Table 1).

The commonest cause of ENT emergency admission was facio maxillary trauma (84.0%) followed by foreign body (5.8%) and throat infection (5.8%) (Table 2). There were total 561 cases of facio maxillary trauma, out of which 48 cases were of facio-maxillary fractures. Mandibular and nasal were the most common sites of fractures followed by zygomatic and maxillary fractures (Table 3). Of these, 93 patients presented with epistaxis along with bony or soft tissue injury. These cases were managed by oral or injectable haemostatic drugs (ethamsylate, tranexemic acid etc.) or by the aid of nasal packing (anterior and/or posterior). 3 patients with intractable epistaxis were immediately shifted to operation theatre and endoscopic cauterization of the bleeder was done.

Table 1 Age and sex distribution

Age (in years)	Male	Female	Total	Male:Female ratio
0–25	175	76	251	2.3:1
26–50	235	86	321	2.7:1
51–75	68	25	93	2.7:1
>75	2	1	3	2:1
Total (N)	480	188	668	2.5:1

Table 2 Distribution of cases by type of disorder (N = 668)

Sr No.	Type of emergency	No. of cases (n)	Percentage (%)
1	Facio maxillary trauma	561	84.0
2	Foreign body	39	5.8
3	Throat pain	39	5.8
4	Burns	13	1.9
5	Earache	6	0.9
6	Non-traumatic epistaxis	5	0.7
7	Vertigo	3	0.4
8	Stridor	2	0.3

Table 3 Cases according to the site of fracture (N = 48)

Site of fracture of facial bone	No. of cases (n)	Percentage (%)
Nasal	19	39.5
Mandible	19	39.5
Zygoma + maxilla	7	14.5
Palate	3	6.2

Sino-nasal emergency also consisted of five patients presenting with non-traumatic epistaxis. The major cause of non-traumatic epistaxis was found to be hypertension.

Cases of foreign body and throat pain were next in prevalence (39 patients each). Foreign body most commonly found in laryngotracheal region (16 cases) (Table 4). The percentage of these cases was found to be high in age group of 2 to 6 years. The patients with throat pain had highest incidence with deep neck space infection and oral abscesses (76.9%) followed by tonsillo-pharyngitis and parotitis (7.7 and 5.1%, respectively) (Table 5). The cases of abscesses required urgent or planned incision and drainage and those with tonsillo-pharyngitis and ulcers were managed conservatively.

The incidence of superficial to deep burns was 1.9% and these patients were managed under the combined care of ORL, HNS and department of General Surgery. Patients with earache attended in TEC were quite low (0.9%). These patients had otitis externa due to varied etiologies or acute otitis media. Three patients were admitted and treated with complaints of vertigo having true ENT cause for the same i.e. labyrinthitis. Call was also attended for two cases of stridor. Larynx was found to be involved with malignant growth in these patients.

The outcome analysis (Table 6) reveals that 75.7% patients (506) required hospital admission. They were transferred to general wards or Intensive Care Units for further management, while 23.6% patients were discharged and were reviewed at regular intervals. Five patients expired in TEC ward, though no mortality was documented

Table 4 Distribution of cases according to the site of foreign body lodgment (N = 39)

Site of F.B. lodgment	No. of cases (n)	Percentage (%)
Ear	15	38.5
Laryngo-tracheal airway	16	41.0
Nose	3	7.7
Esophagus	5	12.8

Table 5 Different conditions with symptom of throat pain (N = 39)

Diagnosis	No. of cases (n)	Percentage (%)
Abscesses	30	76.9
Tonsillo pharyngitis	5	12.8
Parotitis	2	5.1
Ulcers	2	5.1

Table 6 Outcome analysis of patients attending TEC (*N* = 668)

Outcome	No. of cases (<i>n</i>)	Percentage (%)
Admitted	506	75.7
Discharged	157	23.5
Expired in TEC	5	0.7

due to primary ENT disorder, there were associated head, chest or abdominal injuries in those cases.

Discussion

Emergency services forms an integral part of any discipline of clinical medicine and it is considered as an indicator of quality of health care system [2]. Various studies available, point in the same direction that foreign body along with ear, nose and throat infections are the two most common etiologies of cases attending emergency care unit [1, 2, 4]. At SKH, otorhinolaryngology (ORL) specialists also attend cases of facio maxillary trauma, an area unaddressed by their counterparts in most of the centers, widening the scope and spectrum of ORL. The study was done to understand the pattern and distribution of emergency cases and their disposition in terms of admissions and discharge to understand the outcome of such patients.

The male:female ratio was 2.5:1. Similar pattern was also observed in study done by Abbas et al. in 2009 and a retrospective analytical study by Gupta et al. in 2009 with 2.1:1 and 2.6:1, respectively [14, 15]. This, probably, can be accounted for the cultural and social taboos of our country, where males are more exposed to road traffic accidents as compared to women as men are the bread and butter earner of the households and females are predominantly bounded to house. Bleach et al. [4], in a UK based study, reported in their study a male:female ratio of 1.1:1. Such a variation can be accounted for a more liberal and developed social culture and equal work opportunities and exposure for men and women in a developed country like UK.

According to the age range of trauma cases, maximum number of cases fell between 25 and 40 years, with the mean age being 32 years for men and 30 years for women. This corresponds to the report by Prasad et al. [9].

Majority of cases were of facio maxillary trauma (84.0%). Of these, around 67% were of contused lacerated wounds with or without bony injuries. Other cases were of abrasion and soft tissue swelling. In Prasad et al. [9] study, laceration and avulsion were the most common soft tissue injuries and this is consistent with our findings. These cases were promptly managed as per structured protocol

followed at SKH. Needful skiagraphies were carried out to rule out any evidence of bony injury in form of fractures. The patients of facio-maxillary trauma presented with contused lacerated wound, soft tissue injuries (abrasions/soft tissue swelling) and fractures of various facial bones. These were associated with bleeding per oral, nasal or aural. Various treatment protocols included suturing, cleaning and dressing, occlusion packing and fracture reduction, wherever required. Some of these patients were required to be shifted to operation theatre due to severity of lesions. Therefore, these patients were managed in TEC or were transferred to operation theatre.

In patients where facial bone fracture was documented, they were managed as per standard treatment guidelines. These patients were admitted and fracture reduction was done as per the evaluation. The commonest fracture sites comprised mainly of nasal and mandibular (19 cases each), followed by fracture zygoma, maxilla and palate (Table 3). Abbas et al. and Prasad et al. also support our findings of highest incidence of fracture nasal bone, while Gupta et al. mentions that fracture zygoma is the commonest site followed by fracture nasal bone and mandible (14, 9, 15, respectively). Multiple fractures in form of tripod fractures were also seen. These patients were managed by operative procedures in form of miniplating, IMF, fronto-maxillary suspension and nasal bone reduction.

Majority of these patients were of vehicular accident. Demographic distribution study by Abbas et al. [14] have documented that the most common risk factor for maxillofacial injury in road traffic accidents followed by fall. This is in concordance with our findings. This accounts for the need of better road traffic awareness amongst masses. The initiative of Gujarat government for better management in form of emergency ambulance (EMRI 108) also contributes to the workload of trauma management. Although no mortality has been documented due to facio-maxillary trauma per se but the morbidity remains to be high. Face and neck has complex anatomy and as ORL surgeons are well acquainted with this knowledge, face and neck injuries must be taken up by ORL surgeons all levels of health care delivery system and special emphasis must be put during the training program regarding the structured management protocols for such cases. As facio-maxillary trauma is not handled primarily by ENT departments in most of the centers, references for the same are deficient.

Sino-nasal emergencies comprised of traumatic (total 93) and non-traumatic epistaxis (total 5). Epistaxis has been reported as the commonest cause of ENT admission along with peri-tonsillar abscess and sudden hearing loss (Timsit et al. [10]). According to literature, local trauma is the main cause of epistaxis [8]. Prompt management of epistaxis is important for hemodynamic stability of already compromised patient attending TEC. The cases of

traumatic epistaxis in our study have been included in facio maxillary trauma. These patients were managed by one of the following five ways

- a) Conservative- use of decongestant drops and manual pressure for minimal oozing.
- b) Injectable hemocoagulants like ethamsylate, tranexemic acid, botropage.
- c) Anterior nasal packing- for mild active anterior bleeds.
- d) Anterior and posterior packing- for moderate to severe bleeding with a posterior based bleeder.
- e) Endoscopic cauterization- for intractable epistaxis (not responding to any of the above measures)

For most of the patients a, b or c procedure is sufficient and can be managed at home effectively, said Malhotra in his study [7] supported by Upile [10], although 3 patients did require endoscopic cauterization. These patients did not respond to nasal packing and were shifted immediately to operation theatres. Rabelo et al. [8] conducted a study on nasal packing refractory epistaxis and have reported that surgery to manage epistaxis is highly effective, safe and presents low complication rates. In our set up, use of bipolar cautery is practiced more commonly than clipping/ligation, though it must be mentioned that no literature is available stating either of them is better than the other, as per the Rabelo et al. study [8]. Nasal packing was done with either medicated roller gauze pack or with hygroscopic merocels. These are given under the cover of an antibiotic. Posterior nasal packing is done using a no 12 Foley's catheter. This provides an occlusive pressure dressing which in turn assists in hemostasis and adhesion prevention. The thumb rule in management of epistaxis is to "pack under vision" as failing to do that may lead in formation of false tunnels and adhesion formations leading to further complications. Saha et al. [2] performed a study on otorhinolaryngological emergencies and stated that epistaxis comprises of maximum cases of sino-nasal emergencies. Non traumatic epistaxis cases, on investigating, were found to have spontaneous bleed due to underlying inflammation, hypertension. One of the studies conducted on epistaxis by Vaamonde et al. [12] suggests that predominant local etiological causes of epistaxis are inflammation (14%), followed by trauma (12.9%). These cases of non traumatic epistaxis require local drops and three of these patients required anterior nasal packing.

Patients attending TEC with burns were promptly assessed and evaluated for extent of burns, status of skin and mucosa for charring, peeling, blackening or blister formation. Patients were also evaluated for change of voice, tongue or lip edema and perichondritis. Appropriate antibiotics and local ointment were started. These patients were managed under combined care of department of otorhinolaryngology and department of General Surgery at

SKH. A special, well-equipped ward (Burns Unit) has been constructed for burns patients and is attended by a trained staff nurse 24 × 7.

As compared to other studies, incidence of foreign body (FB) was low (5.8%). Bleach et al. [4] have documented that aero-digestive tract foreign body is the most common emergency addressed by ENT specialists. This can possibly be accounted to the fact that the major load of emergency at SKH is facio maxillary trauma which is not been addressed by the ENT departments in other studies. Diagnosis of foreign body is mainly based on clinical history. Usually the history is of acute onset but rarely an old retained, impacted FB (usually in ear) also presented to TEC. Majority of cases comprised of FB airway (Table 4). These cases were in the age group 2–6 years. These patients presented with history of breathing difficulty, cough or many a times asymptomatic. This could be due to FB small enough not to cause airway obstruction. Metallic FBs were detected on skiagraphy while vegetative ones were suspected on decreased air entry clinically and collapsed lungs on skiagraphy. Immediate bronchoscopy (rigid) was done for the same. Of the FBs retrieved, vegetative (seeds) and coins were found commonly. In comparison, the FB ear cases were mainly asymptomatic. The age incidence of these patients (2 to 6 years) is indicative of the fact that there is a possibility of poor home vigilance and that counseling of parents regarding proper care of children and keeping them out of reach of substances that can possibly act as potential foreign bodies. This suggests a possible role of targeted therapy of the same age group and parental counseling. Study by Saha et al. [2] mentions that fish bone impaction accounts for the highest incidence attributed to the food habits of the local population.

For management of such patients, prompt action is required. All larygotracheal/airway and upper gastrointestinal FBs needs to be removed under GA. Simultaneously, airway patency has to be maintained. Tracheostomy consent was taken though no patient required tracheostomy.

Similar incidence of throat pain was noted. Thirty patients of throat pain came with abscesses at different sites. Incision and drainage was done in all these patients. These patients belonged to different age groups ranging from 10 months to 70 years. Three patients presented with sore throat and pyrexia (acute tonsillo-pharyngitis) and were managed conservatively. Saha et al. [2] quotes that maximum number of cases for throat related emergencies (non foreign body) are that of acute tonsillo-pharyngitis. While that in our set-up, were abscesses (Table 5). This possible indicates the decreasing incidence of tonsillo-pharyngitis due to better antibiotic coverage and that tonsillo-pharyngitis is not a major problem in this part of

subcontinent. Also patients coming with complaints of oral ulcers were managed conservatively.

Otologic emergencies were quite rare on the contrary, constituting only 0.9%. Earache was the most common complaint. Bleach et al. [4] suggests that of the total admission rate, earache and minor ear problems like wax, foreign body etc. formed the largest group. The same study suggests that majority of otologic emergencies can be managed by general practitioners. Otitis externa and acute otitis media were found to be the commonest cause of otologic emergency. The predisposing factors for otitis externa could be genetically induced, environmentally induced and self-induced [11]

Traumatic tympanic membrane perforations and ear bleed/discharge secondary to trauma/assault have been included in facio-maxillary trauma cases. One case of idiopathic sudden onset facial palsy visited TEC was also managed conservatively with supportive and rehabilitative therapy.

We also attended five cases of vertigo (total 3) and stridor (total 2) primarily in TEC ward. While the patients of vertigo were managed conservatively and admitted for observation, patient came with stridor managed by tracheostomy. The most common cause of ENT mortality is respiratory obstruction and upper airway problems [1, 3] though no mortality occurred in our set up due to any ENT cause during the entire study period.

Malhotra et al. [7] analyzed in their large city based emergency study that majority (57.7%) of all otorhinolaryngological emergencies are moderately severe requiring treatment but not admission. They also quote that a large proportion of patients attending casualty department do not constitute real emergencies and doors should be closed to these patients in order to increase the efficiency in dealing with real emergencies. But in our experience, however trivial, the case may look, thorough examination is indicated to avoid missing major conditions which may not be symptomatic on presentation, viz condylar fractures, facial paresis/palsy, battle's sign, CSF otorrhoea/rhinorrhoea, traumatic perforation of drum etc. These may then, later, present with serious complications/deformities.

Worldwide, trauma is the fourth ranking cause of death at all ages and the most frequent killer in the age group of 1–37 years [16]. This accounts for the need to address otorhinolaryngological emergencies meticulously and promptly by an otorhinolaryngologist at the level of primary management at trauma and emergency care wards to provide better quality of life and cosmetic results.

Conclusion

The spectrum and horizon of emergency workload in ORL, HNS has widened and the pattern of distribution of

emergency workload has re-equated with the rise in road traffic accidents and violence on a rise. Facio-maxillary trauma has mushroomed and overshadowed all the other causes of emergency cases including foreign body impaction and, ENT infections, burns etc. attended by ORL surgeons in our set-up. Thus, structured protocol has been set alongside the working three-tier system for efficient and effective management of such patients at our institute. Trauma management should also be an integral part of residency training program and it will help them to handle a variety of cases efficiently and effectively. Also, we need to establish a protocol for true emergencies, which generally require immediate attention and management.

Conflict of Interests None.

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