Changing trends in otorhinolaryngological diseases at a non-government clinic in Jaipur

Kiran Gaur · Neeraj Kasliwal · Amit Bhandari · B. Amisha · V. P. Gupta · Rajeev Gupta

Abstract

Background Otorhinolaryngological (ENT) diseases are major health problem in India but the trends in occurrence of various disorders in clinical practice have not been well studied. To assess the types of such diseases and to determine changing trends in their incidence we performed this study.

Methods The study was done at a non-government ENT center at Jaipur. From 1975 to 2005, >125000 patients of different diseases were evaluated here. The study includes randomly selected patients (n = 11454) from years 1980 to 2000 at an interval of 5 years to evaluate disease trends. Significance of trends was evaluated using least squares regression.

Results In the years 1980, 1985, 1990, 1995 and 2000 mean age of patients was 26.60 ± 17.81 (range 0.16 to 85), 27.07 ± 16.91 (0.08 to 90), 28.30 ± 17.73 (0.25 to 90), 28.79 ± 17.8 (0.25 to 90) and 28.74 ± 17.81 (0.25 to 85) years respectively. 51 types of ENT diseases were observed of which 19 contributed to 76.8% (8807) patients and analysis was restricted to them. Chronic suppurative otitis media (2203,

19.2%), otitis externa (859, 7.5%), deviated nasal septum with nasal obstruction (717, 6.3%) and chronic tonsillitis (695, 6.1%) were the most common, followed by ear wax (569, 4.9%), sensorineural hearing loss (545, 4.7%), chronic rhinosinusitis (428, 3.7%) and epistaxis (320, 2.8%). There was increasing trend for stomatitis ($b = 0.0014$), deviated nasal septum ($b = 0.0290$), allergic rhinitis ($b = 0.0023$), epistaxis ($b = 0.0002$), acute tonsillitis ($b = 0.0003$), hoarseness ($b = 0.0017$), deaf mutism ($b = 0.0005$), sensorineural hearing loss ($b = 0.0038$), tinnitus ($b = 0.0006$) and ear wax ($b = 0.0050$). Declining trend was observed for chronic rhinosinusitis ($b = -0.0155$), otitis externa ($b = -0.0063$), chronic suppurative otitis media ($b = -0.0001$), acute otitis media ($b = -0.0007$), secretory otitis media ($b = -0.0013$), otosclerosis ($b = -0.0007$), vertigo ($b = -0.0007$), neck swelling ($b = -0.0005$) and chronic tonsillitis ($b = -0.0194$).

Conclusion This study from an Indian urban ENT center shows a significantly increasing trend in chronic and degenerative ear diseases and decline in infection related diseases.

Keywords Otorhinolaryngological diseases · ENT disorders · Trend analysis · Least squares regression principle

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Introduction

Burden of diseases report released by the National Commission of Macroeconomics and Health enumerates common disease conditions in India [1]. Major diseases in group of communicable, maternal and perinatal conditions, in descending order, include tuberculosis, HIV/AIDS, diarrheal diseases, malaria and other vector borne diseases, leprosy, childhood diseases, and otitis media. Otitis media leads to loss of 0.47 million disability adjusted life years (DALYs) and causes 0.1% of share in the total burden of diseases in

India in contrast to tuberculosis which leads to loss of 7.58 million DALYs and 2.8% share of disease burden. Oral diseases also lead to substantial loss of DALYs (1.25 million) and are listed among the top ten non-communicable diseases. Clearly otorhinolaryngological (ENT) diseases are major, but often neglected, health problems in India. Most of the ENT disease patients are examined at the primary care settings in both urban and rural areas. Although the burgeoning non-government system has resulted in these patients being examined in such clinics, the major site for common ENT diseases patients are government run primary and secondary health care centers. It is essential for the primary physician to be well aware of the incidence, trends and treatment of common ENT diseases and to take adequate preventive measures to reduce their incidence or conversion of an acute treatable condition into a chronic disease.

In developed countries reports suggest a changing pattern of ENT diseases in the last few years [2]. Infection related diseases such as tonsillitis and acute or chronic ear infections were the major ENT problems in the mid 1960's. These have now been replaced by increasing prevalence of degenerative diseases of ear and hearing and allergic disease conditions of nose and throat. In India, there has been no systematic analysis of trends in major ENT disorders presenting to government or non-government clinics. To determine the prevalence of these diseases and to evaluate the changing trends in a clinic-based setting we have performed the present study.

Materials and methods

The collection of data was done retrospectively at a non-government ENT center at Jaipur. This center was established more than 30 years ago and during this period more than 125,000 patients suffering from different ENT diseases have been examined. To provide manageable data and to evaluate trends we retrospectively analysed data from all the patients over a one year period at an interval of five years, i.e. in the years 1980, 1985, 1990, 1995 and 2000. Number of patients in these 5 years was 2178, 2262, 2202, 2312 and 2500 respectively and in the present study data of 11454 patients were analysed.

Details of demographic and life style factors such as age, sex, religion, area of residence (urban, semi-urban and rural), locality (for urban area only as upper class, middle class and lower class), disease duration, disease condition and tobacco and alcohol intake habit were obtained from medical records. All the case files were screened and coded for diagnosis by a single clinician (BA) and any conflict in diagnosis was resolved after consultation with the senior clinician (NK). The patients were classified according to the presenting complaint and major diagnosis in various disease conditions according to International Classification of Diseases (ICD-9).

Statistical analyses All the data were computerized. Patients were grouped into various disease diagnoses and tabulated. Statistical analyses were performed using SPSS version 12.0 program (SPSS Inc, Chicago, USA). Trends were determined by least squares regression method. Correlation coefficient (r) as well as regression coefficient (b) for trends were determined. P value of less than 0.5 was considered significant.

Results

Demographic details of the study subjects are provided in Table 1. There were more males (7241, 63.2%) than females. A broad age group range was observed. In various years the mean age was 26.6 ± 17.8 (range 0.16 to 85), 27.1 ± 16.9 (range 0.08 to 90), 28.3 ± 17.7 (range 0.25 to 90), 28.8 ± 17.8 (range 0.25 to 90) and 28.7 ± 17.8 (range 0.25 to 85) respectively. The majority of subjects belonged to the urban areas (6950, 60.7%) as compared to the semi-urban (3690, 32.2%) or rural (814, 7.1%). Among the urban subjects most of the subjects lived in upper or middle class locations. Any tobacco use (smoking or non-smoked tobacco intake) was observed in 2133 (18.6%) and any alcohol intake reported in 738 (6.4%).

Fifty-one common ENT disorders were diagnosed in the patients. Out of these 51 diseases, 19 accounted for 76.8% of subjects ($n = 8807$). Prevalence of these diseases is reported in Table 2. Chronic suppurative otitis media (2203, 19.2%), otitis externa (859, 7.5%), deviated nasal septum with nasal obstruction (717, 6.3%) and chronic tonsillitis (695, 6.1%) were the most common. These were followed by ear wax (569, 4.9%), sensorineural hearing loss (545, 4.7%), chronic rhinosinusitis (428, 3.7%) and epistaxis (320, 2.8%). Prevalence of these diseases at the 5-yearly intervals are also shown in Table 2.

Trend analyses were restricted to the 19 more common diseases (Table 3). There was increasing trend for stomatitis ($b = 0.0014$), deviated nasal septum with nasal obstruction ($b = 0.0290$), allergic rhinitis ($b = 0.0023$), epistaxis ($b = 0.0002$), acute tonsillitis ($b = 0.0003$), hoarseness ($b = 0.0017$), deaf mutism ($b = 0.0005$), sensorineural hearing loss ($b = 0.0038$), tinnitus ($b = 0.0006$) and ear wax ($b = 0.0050$). Declining trend was observed for chronic rhinosinusitis ($b = -0.0155$), otitis externa ($b = -0.0063$), chronic suppurative otitis media ($b = -0.0001$), acute otitis media ($b = -0.0007$), secretory otitis media ($b = -0.0013$), otosclerosis ($b = -0.0007$), vertigo ($b = -0.0007$), neck swelling ($b = -0.0005$) and chronic tonsillitis ($b = -0.0194$).

Discussion

This study from an Indian urban ENT center shows that over a period of 20 years there has been an increase in

Table 1 Demographic characteristics of the patients

Variable	Male (n = 7241)	Female (n = 4213)	Total (n = 11454)
Age group			
1–19	2726 (37.6)	1429 (33.9)	4155 (36.3)
20–59	4039 (55.8)	2545 (60.4)	6584 (57.5)
60 and above	476 (6.6)	239 (5.7)	715 (6.2)
Area of residence			
Urban	4154 (57.4)	2796 (66.4)	6950 (60.7)
Semi-urban	2543 (35.1)	1147 (27.2)	3690 (32.2)
Rural	544 (7.5)	270 (6.4)	814 (7.1)
Locality (For urban area only; males 4154, females 2796, total 6950)			
Upper class	1214 (29.2)	902 (32.3)	2116 (30.4)
Middle class	2290 (55.1)	1459 (52.2)	3749 (53.9)
Poor	636 (15.3)	425 (15.2)	1061 (15.3)
Slum	14 (0.4)	10 (0.3)	24 (0.4)
Tobacco use			
Yes	1992(27.5)	141(3.3)	2133 (18.6)
Alcohol use			
Yes	725 (10.0)	13 (0.3)	738 (6.4)

Figures in parentheses are percentages

Table 2 Frequency distribution of major disease conditions in various years

Name of the disease	Years					
	1980 n = 2178	1985 n = 2262	1990 n = 2202	1995 n = 2312	2000 n = 2500	Total n = 11454
Deviated nasal septum with nasal obstruction	54 (2.5)	53 (3.3)	97 (4.4)	127 (5.5)	386 (15.4)	717 (6.3)
Allergic rhinitis	68 (3.1)	73 (3.2)	59 (2.7)	91 (3.9)	99 (4.0)	390 (3.4)
Chronic rhinosinusitis	164 (7.5)	115 (5.1)	68 (3.1)	52 (2.2)	29 (1.2)	428 (3.7)
Epistaxis	54 (2.4)	58 (2.6)	74 (3.4)	81 (3.5)	53 (2.1)	320 (2.8)
Stomatitis	21 (1.0)	16 (0.7)	21 (0.9)	18 (0.8)	41 (1.6)	117 (1.0)
Acute tonsillitis	55 (2.5)	38 (1.7)	59 (2.7)	38 (1.6)	68 (2.7)	258 (2.3)
Hoarseness	49 (2.2)	67 (2.9)	65 (2.5)	88 (3.8)	67 (2.7)	336 (2.9)
Neck swelling	43 (2.0)	47 (2.1)	40 (1.8)	50 (2.2)	41 (1.6)	221 (1.9)
Chronic tonsillitis	209 (9.6)	206 (9.1)	123 (5.5)	102 (4.4)	55 (2.2)	695 (6.1)
Deaf mutism	21 (1.0)	28 (1.2)	39 (1.8)	33 (1.4)	28 (1.1)	149 (1.3)
Otitis externa	180 (8.3)	174 (7.7)	194 (8.8)	191 (8.3)	120 (4.8)	859 (7.5)
Chronic suppurative otitis media	405 (18.6)	471 (20.8)	420 (19.1)	401 (17.3)	506 (20.2)	2203 (19.2)
Acute otitis media	105 (4.8)	89 (3.9)	90 (4.1)	92 (4.0)	110 (4.4)	486 (4.2)
Secretory otitis media	37 (1.7)	50 (2.2)	42 (1.9)	40 (1.7)	32 (1.3)	201 (1.8)
Otosclerosis	19 (0.9)	18 (0.8)	12 (0.5)	22 (0.9)	11 (0.4)	82 (0.7)
Sensorineural hearing loss	99 (4.5)	83 (3.7)	106 (4.8)	107 (4.6)	150 (6.0)	545 (4.8)
Vertigo	30 (1.4)	16 (0.7)	15 (0.7)	15 (0.6)	26 (1.0)	102 (0.9)
Tinnitus	12 (0.6)	31 (1.4)	33 (1.5)	40 (1.7)	18 (0.7)	134 (1.2)
Wax	97 (4.4)	87 (3.9)	100 (4.3)	125 (5.4)	155 (6.2)	564 (4.9)

Figures in parentheses are percentages

Table 3 Correlation coefficients and least squares regression analysis for trends in various diseases

Disease	Correlation coefficient (r)	Regression coefficient (b)	P value
Deaf-mutism	0.2546	0.0005	0.6792
Otitis externa	−0.6301	−0.0063	0.2544
Chronic suppurative otitis media	−0.0216	−0.0001	0.9724
Acute otitis media	−0.3406	−0.0007	0.5747
Secretory otitis media	−0.6148	−0.0013	0.2697
Otosclerosis	−0.5121	−0.0007	0.3776
Sensorineural hearing loss	0.7323	0.0038	0.1593
Vertigo	−0.3689	−0.0007	0.5411
Tinnitus	0.2155	0.0006	0.7276
Ear wax	0.8685	0.0050	0.0560
Deviated nasal septum with nasal obstruction	0.8474	0.0290	0.0698
Allergic rhinitis	0.6540	0.0023	0.2311
Chronic rhinosinusitis	−0.9764	−0.0155	0.0043
Epistaxis	0.0583	0.0002	0.9257
Stomatitis	0.6081	0.0014	0.2764
Acute tonsillitis	0.1030	0.0003	0.8686
Hoarseness	0.4738	0.0017	0.4201
Chronic tonsillitis	−0.9798	−0.0194	0.0034
Neck swelling	−0.4415	−0.0005	0.4566

degenerative ear diseases such as sensorineural hearing loss and allergic rhinitis and decline in infection related diseases such as chronic rhinosinusitis and chronic tonsillitis. There is no such study from India and only a few studies exist in other countries.

Symrouleakis et al. [2] performed an epidemiological study on 6771 patients in 2005 at a university general hospital in Greece. Over 60% of the cases were classified in ten major groups of diagnosis. Acute tonsillitis (12.3%) and acute pharyngitis (9.0%) were the most common followed by otitis media (7.6%), external ear canal obstruction by ear wax (6.2%) and edema of the larynx in 0.4%. In this study it is evident that patients with acute conditions seek early treatment at a general hospital setting while in the present study which was at an ENT clinic the patients visit the specialist once the disease becomes chronic. Hannaford et al. [3] studied the prevalence of ENT problems in Scotland and reported a higher incidence of inner ear problems, i.e., dizziness (21%) and unsteadiness (29%). In the present study infections are the major issues with infective ear conditions—chronic suppurative otitis media (19.2 %) as the most prevalent disease probably because of undernourishment, unhygienic and poor socio-economic conditions. Prevalence of infective nasal conditions such as chronic sinusitis varies widely in different studies with high of 16% reported in a national survey and low of 2% in Olmstead County in north-central America [4]. In the present study this was in 3.7% patients which verifies a high infection rate. Perez et al. [5] performed an audit of ENT emergencies in a gen-

eral hospital for a year (1990–91). The most common pathologies presented were infectious inflammations (41%), hemorrhages (21%) and foreign bodies (18.5%), but the most frequent etiologies were epistaxis (16.3%), otitis media (14.8%) and otitis externa (14.8%). We observed a very low incidence of epistaxis (2.8 %) in our study. Similarly, a study in Ireland conducted by O'Driscoll et al. [6] reported that otitis externa (21%) as their most common disease. In our study too this disease was in significant proportions (7.5%).

We observed an increasing trend for stomatitis, deviated nasal septum with nasal obstruction, allergic rhinitis, epistaxis, acute tonsillitis, hoarseness, deaf mutism, sensorineural hearing loss, tinnitus and ear wax. This could be due to either increasing awareness of these diseases or early referrals to the secondary care center. On the other the declining trend in chronic rhinosinusitis, otitis externa, chronic suppurative otitis media, acute otitis media, secretory otitis media, and chronic tonsillitis may reflect changing patient profile, availability of better treatment at primary centers or delayed referrals. There are a large number of factors that influence self-referral or physician-referrals of patients to the secondary care centers in India [1] and we have not performed a systematic analysis of these factors. This is a study limitation. Other limitations include the fact that although the data are sufficient to assess prevalence of various ENT diseases at our center but we were unable to compare our results with other available studies, as they are few. The number of medical records available for analysis (>125 000

Fig. 1 Trends (r value) in prevalence of selected diseases show significant increase in hearing loss and allergic disorders and decline in infectious conditions such as otitis externa, chronic rhinosinusitis and chronic tonsillitis

patients) was very large but for sampling convenience subjects presenting to the clinic every fifth year from 1980 to 2000 were evaluated and although the sample size is large ($n = 11454$) it represents about 10% of the total subjects. Finally our data are drawn from only one institution and it is difficult to assess the real needs of community as there is a lack of evidence from primary care settings.

This study clearly shows that although a large number of ENT diseases are seen in clinical practice only 19 conditions are commonly encountered. There is a significant increase in acute throat infections and degenerative ear diseases and decline in chronic ear infections and over the

years there has been increased awareness in patients, so that they are presenting with acute conditions than in chronic stages. But by using this information as base line we could have a preliminary approach regarding the health needs of this population.

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