


Prevalence of Otolaryngology Diseases in an Urban Homeless Population

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Abstract

Objective. Otolaryngology diseases are common among people experiencing homelessness; however, they are seldom evaluated in a specialist setting, and investigations on their prevalence have rarely been conducted. The aim of this retrospective study was to evaluate the prevalence of otolaryngology conditions in an urban homeless population.

Study Design. Retrospective study.

Setting. Primary health care facility.

Methods. The clinical records of patients referred to the medical facilities of the Primary Care Services of the Eleemosynaria Apostolica, Vatican City, between October 1, 2019, and July 31, 2021, were retrospectively reviewed; those reporting at least 1 otolaryngology disease were included in the study.

Results. A total of 2516 records were retrospectively reviewed, and 484 (19.24%) were included in the study. The most common otolaryngology disease was pharyngotonsillitis ($n = 118$, 24.13%), followed by rhinitis with nasal obstruction ($n = 107$, 21.88%), hearing loss ($n = 93$, 19.01%), otitis ($n = 81$, 16.56%), abscess ($n = 46$, 9.40%), and sinusitis ($n = 33$, 6.74%). Head and neck cancer or precancerous lesions were reported in 34 subjects (7.02%). More than 1 simultaneous otolaryngology disorder was found in nearly 50% of our sample. A wide range of comorbidities was also reported.

Conclusions. Our results confirm an elevated otolaryngology demand in the homeless population and encourage the development of more efficient and effective strategies for a population-tailored diagnosis and treatment of these conditions.

Keywords

otolaryngology, homelessness, head and neck surgery, fragile populations

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People experiencing homelessness have peculiar characteristics that make them more vulnerable to several medical conditions, leading to all-cause morbidity and mortality higher than the general population.^{1,2} In addition,

the homeless population often experiences barriers to receive adequate health care and encounters negative or discriminatory approaches within the public health care system.³⁻⁵ Together, these circumstances may lead to delayed or missed diagnoses, worse clinical presentation of diseases, and increased rates of hospitalization for preventable conditions.^{6,7}

A few studies have focused on otolaryngology diseases in the homeless population.⁸⁻¹³ Gurgel et al¹² evaluated otolaryngology needs in 11,690 homeless patients and found a prevalence of 15.2%; the most common diagnoses were upper respiratory infections, cough, dysphagia, and disorders of the ear. Wu et al⁸ examined 100 adult homeless individuals in Toronto, Canada, and identified 22 patients with otolaryngology needs, including 2 head and neck masses. Westerberg and Lango¹⁴ published a study on otolaryngology-related disorders in vulnerable populations in North America, finding that biologic, behavioral, and socioeconomic factors led to more advanced disease presentation and higher rates of inappropriate care. Moore and Durden¹⁰ assessed rates of undiagnosed head and neck cancer in homeless adults and reported that 41.4% of 325 homeless individuals in the United States had an otolaryngology complaint and 9% had a histologically confirmed head and neck malignancy. A study conducted by Noel et al⁹ showed that approximately 40% and 52% of 100 adult homeless people presented speech-frequency hearing loss and high-frequency hearing loss, respectively.

There are nearly 8000 homeless people in Rome, Italy, of whom about 3000 have no shelter for the night, according to

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the Italian Institute of Statistics.¹⁵ In this retrospective study, we aimed at reporting the prevalence of otolaryngology diseases in people experiencing homelessness, as assisted by the Primary Care Services of the Eleemosynaria Apostolica, Vatican City, in a central neighborhood of Rome.

Materials and Methods

Clinical records were retrospectively reviewed of patients experiencing sheltered or unsheltered homelessness who were referred to the medical facilities of the Primary Care Services of the Eleemosynaria Apostolica, Vatican City, between October 1, 2019, and July 31, 2021.

Records reporting at least 1 otolaryngology disease in adults experiencing homelessness were included in the study. Patients were defined as “homeless” if they had been residing in a homeless shelter for a minimum of 7 consecutive days (sheltered homelessness) or they indicated living on the street or in places not meant for human residency for at least 120 nonconsecutive days in the last 6 months (unsheltered homelessness).^{9,16,17} Participants were excluded if they were <16 years of age or did not match criteria for homelessness.

The following information was extracted from each medical record: full name, age, sex, country of origin, years spent in Italy, housing condition (sheltered/unsheltered), employment status, and smoking and drinking habits. The diagnosed otolaryngology disorder was tracked, with comorbidities if present. Collected data were manually entered into a Microsoft Excel database. The study was approved by the Istituto di Medicina Solidale Institutional Review Board (IMES/12/2021) and conducted in accordance with the Declaration of Helsinki.

Patient Evaluation Protocol

The evaluation protocol for patients presenting to the Primary Care Services of the Eleemosynaria Apostolica, Vatican City, has been described by our group.¹⁸⁻²⁰ Briefly, a medical doctor compiled for each person a clinical-anamnestic record with demographic details, current clinical conditions, and medical history. The same record was updated in case of follow-up visits. Then, a basic health assessment was performed with medical examination and measurement of vital parameters, such as body temperature, blood pressure, and oxygen saturation. In case of suspected or self-reported otolaryngology disease, the patient underwent, on the same day, a full on-site otolaryngology examination performed by a specialist.

During COVID-19 pandemic, all patients received a rapid antigen nasopharyngeal swab for SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2; NADAL COVID-19 Antigen Rapid Test, Nal Von Minden GmbH) before being admitted to the primary care facility. If positive, they were immediately referred to dedicated services in the Italian public health system.

Otolaryngology examination included otoscopy and a thorough examination of the nasal cavity, oral cavity, oropharynx,

and neck. In case of suspected nasopharyngeal or laryngeal pathology, examination with a flexible endoscope was performed. Details about otolaryngology diseases were noted on the patient’s clinical record, and appropriate medical or surgical treatments were prescribed. If necessary, patients were referred to the otolaryngology service of a tertiary care hospital within the Italian national public health system for further diagnostic examinations or treatments, which were subsequently reported in the original clinical record.

Outcome Measures

Primary outcome measures included prevalence of otolaryngology disorders and specific otolaryngology diseases found at the specialist’s medical examination; secondary outcome measures comprised comorbidities and demographic data.

Statistical Analysis

Descriptive analysis was used for the main demographic characteristics of the patients and results of otolaryngology examination. Prism Software version 8.3.1 (GraphPad Software LLC) was used to perform statistical analysis and prepare figures.

Results

A total of 2516 records of people experiencing homelessness, representing approximately 30% of the homeless population in Rome, were retrospectively reviewed. An overall 484 records (19.24%) matched the inclusion criteria and were included in the study. Characteristics of our sample are detailed in **Table 1**.

The sample was composed of 337 males (69.62%) and 147 females (30.38%), and the average age was 46.82 years (range, 16-82 years; SD = 14.12, SE = 0.6602). Subjects came from 61 countries in 4 continents; the most represented countries were Italy (n = 129, 26.65%), Romania (n = 116, 23.96%), Poland (n = 29, 5.99%), and Nigeria (n = 19, 3.92%). The continent of origin was Europe for 327 subjects (67.56%), followed by Africa (n = 88, 18.19%), Asia (n = 37, 7.64%), and North and South America (n = 32, 6.61%).

The average time in Italy for people coming from a different country was 9.26 years (range, 1-60 years; SD = 8.97, SE = 0.4719). A significant portion of the subjects (n = 316, 65.29%) were living in the streets, while 168 (34.71%) indicating being hosted in shelters or encampments at the time of the visit. Most (n = 417, 86.16%) were unemployed at the time of the visit, while 67 (13.84%) had a job. Smoking (>10 cigarettes/d) was cited by 241 patients (49.79%) and alcohol abuse by 84 (17.35%).

The most common abnormal otolaryngology condition in our sample was pharyngotonsillitis (n = 118, 24.38%), acute (n = 54) and chronic (n = 64), followed by rhinitis with nasal obstruction (n = 107, 22.10%), hearing loss confirmed by pure tone audiometry (n = 93, 19.21%), otitis (n = 81, 16.73%), abscess (n = 46, 9.50%), and acute or computed tomography–confirmed chronic sinusitis (n = 33, 6.81%). Histologically

Table 1. Demographic Characteristics of Participants.

Characteristic	No. of patients
Sex	
Male	337
Female	147
Age, y	
16-17	16
18-29	36
30-39	75
40-49	132
50-59	139
60-69	64
≥70	22
Years spent in Italy, y	
0-4	170
5-9	45
10-14	51
15-19	38
20+	51
Ethnicity	
White	313
Black	81
Asian	41
Other/mixed	49
Living setting	
Unsheltered/street	316
Sheltered	168
Work	
Employed	67
Unemployed	417
Alcohol abuse	84
Tobacco, >10 cigarettes/d	241

confirmed head and neck cancer or precancerous lesions were noted in 34 subjects (7.02%), mainly in the oral cavity (n = 19, 3.92%), larynx (n = 8, 1.65%), parotid gland (n = 4, 0.83%), and thyroid (n = 3, 0.62%). The full list of otolaryngology diseases in our sample is detailed in **Table 2**.

A significant portion of our sample had >1 simultaneous otolaryngology disorder: 153 patients (31.61%) had 2 complaints, 63 (13.01%) had 3, and 20 (4.13%) had 4. The majority of the patients with at least 1 otolaryngology disorder were symptomatic at the time of the visit (n = 371, 76.65%), while the remaining subjects (n = 113, 23.35%) were asymptomatic or unable to report specific symptomatology.

Patients in our sample had a range of comorbidities, with the most common health issues being an active cardiovascular condition (n = 78, 16.11%), psychiatric condition (n = 28, 5.78%), osteoarticular disease (n = 24, 4.96%), or dermatologic issue (n = 23, 4.33%). All comorbidities in our sample are detailed in **Table 3**.

Table 2. Otolaryngology Disorders in Our Sample.

Otolaryngology disorder	No. of diagnoses
Ear	230
Hearing loss	93
Otitis	
External otitis	36
Acute otitis media	33
Chronic otitis media	11
Cerumen plug	32
Tinnitus	6
Acute vertigo	7
Ear eczema	12
Nose	162
Rhinitis/nasal obstruction	
Allergic rhinitis	48
Chronic rhinitis	59
Nasal fracture	7
Sinusitis	
Acute	12
Chronic	21
Epistaxis	6
Obstructive sleep apnea syndrome	9
Oral cavity	123
Pharyngotonsillitis	
Acute	54
Chronic	64
HPV-related disorders in the oral cavity	5
Upper respiratory tract	107
Foreign body	13
Dysphagia	2
Dysphonia	29
Hemoptysis	4
Laryngopharyngeal reflux	59
Head and neck cancer	34
Oral cavity	
Cancerous lesion	8
Precancerous lesion	11
Larynx	
Cancerous lesion	7
Precancerous lesion	1
Parotid gland tumor	4
Thyroid cancer	3
Other	71
Abscess	
Dental abscess	38
Cervical abscess	6
Peritonsillar abscess	2
Temporomandibular dysfunction	14
Trigeminal neuralgia	3
Maxillofacial trauma	8

Table 3. Comorbidities in Our Sample.

Comorbidity	No. of diagnoses
Cardiovascular disorder	78
Psychiatric disorder	28
Osteoarticular disorder	24
Dermatologic disorder	23
Thyroid dysfunction	17
Liver disorder	14
Respiratory disorder	13
Gastritis	9
Obesity	7
Drug abuse	7
HIV	6
Traumatic injury	3
Active cancer	2
Kidney failure	2
Other	31

Almost half of the sample presented at least 1 diagnosed comorbidity (n = 191, 39.46%), while 49 (10.12%) had 2 comorbidities, 17 (3.51%) had 3, and 3 (0.62%) had 4.

Discussion

This study retrospectively analyzed the presence of otolaryngology diseases in a population of homeless persons seeking general medical care in the Primary Care Services of the Eleemosynaria Apostolica, Vatican City. These facilities are located in the Vatican City State, an enclave within Rome, and assist vulnerable populations. Our analysis, which comprised approximately 30% of the total homeless population of Rome, shows that nearly 20% of the sample had ≥ 1 abnormal otolaryngology conditions, including head and neck malignancies. The most frequent otolaryngology disorder was pharyngotonsillitis, followed by rhinitis with nasal obstruction, hearing loss, otitis, abscess, and sinusitis. In addition, nearly 50% of the patients had >1 simultaneous otolaryngology abnormal finding.

The otolaryngology diseases diagnosed in our sample are similar to those found in the general population²¹⁻²⁷; however, there are specific conditions that should be taken into account when evaluating people experiencing homelessness, such as the environmental, social, and individual factors that often lead to delayed diagnosis and treatment.²⁸⁻³⁰ This is often due to barriers in accessing specialist care that brings most homeless patients to be seen in emergency departments, primary care health clinics, or national community services; in these settings, primary care physicians are mainly responsible for examining patients. Consequently, complex diseases, which are a prerogative of specialist physicians, often remain unnoticed.^{4,12,31,32}

The prevalence of otolaryngology diseases in our sample is consistent with that found by Gurgel et al¹² in a sample of 11,690 homeless patients and Wu et al⁸ (22%) among 100 adult patients. Upper respiratory tract infections were the

most common conditions in our patients, as noted in other studies.^{8,10,12}

In our sample, we found 34 patients with cancerous or precancerous lesions of the head and neck, probably due to elevated alcohol and tobacco use. These conditions are particularly relevant in the homeless population, as they are often diagnosed in a late stage and have a poor prognosis.³³⁻³⁵ The prevalence of head and neck cancer in our study is similar to that found by Wu et al⁸ (7%) and Moore and Durden¹⁰ (9%), while Gurgel et al¹² cited a lower percentage (<1%), probably due to the significantly larger size of their sample.

Hearing loss is another common complaint among homeless people; our findings are comparable to those of Gurgel et al¹² (11%) but significantly lower than Noel et al⁹ (40%-52%). However, in the latter study, the sample was smaller (100 patients), and all patients underwent audiologic evaluation, in contrast to our study in which we performed pure tone audiometry only in patients complaining of hearing loss.

It has been demonstrated that homeless people are particularly exposed to several medical conditions, such as heart and vascular diseases, diabetes, hypertension, chronic obstructive pulmonary disease, and infections, often presenting with acute onsets and requiring long hospital stays.³⁶⁻⁴⁰ In our sample, we found a range of comorbidities among homeless persons, with the most common being active cardiovascular conditions, psychiatric conditions, osteoarticular diseases, and dermatologic issues; furthermore, $>50\%$ of our patients presented at least 1 comorbidity. In this vulnerable population, the need for health care often comes after the need for food and shelter, thus leading to important diagnostic delays and increases in morbidity and mortality. In addition, these patients often do not attend scheduled outpatient visits and show reduced compliance for prescribed therapies and follow-up programs.^{41,42}

Limits of the Study

This study presents some strengths and some limits. Strengths include the large number of patients in our sample, accounting for about 30% of the total homeless population of Rome and therefore representing a comprehensive overview of the homeless population in the urban area in which our study took place. Among the limits, we remark that patients were referred to the otolaryngology specialist if they self-reported a head and neck disorder or if the primary care provider found a suspect condition; however, some patients may have been missed because of our sampling strategy. Furthermore, patients feeling healthy did not refer to our center and could not be evaluated for potential unnoticed pathologic conditions. In addition, pharyngolaryngoscopy was performed only in patients who were suspected of a nasopharyngeal or laryngeal pathology and pure tone audiometry only in patients that complained of hearing difficulties. Last, the retrospective design should be considered among the limits of this study.

Conclusions

In this study we found that nearly 20% of persons referring to the Primary Care Services of the Eleemosynaria Apostolica, Vatican City, and seeking general medical care had at least 1

active otolaryngology disease, with nearly 50% having ≥ 2 simultaneous conditions. Of these, 34 persons had cancerous or precancerous lesions of the head and neck. Our results suggest an elevated otolaryngology demand in the homeless population and encourage the development of more efficient and effective strategies for a population-tailored diagnosis and treatment of these conditions.

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Author Contributions

Massimo Ralli, drafting the work, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; **Alessia Marinelli**, acquisition of data, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; **Fabio De-Giorgio**, conception of the work, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; **Domenico Crescenzi**, data analysis, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; **Marco de Vincentiis**, revision of the work critically for important intellectual content, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; **Antonio Greco**, revision of the work critically for important intellectual content, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; **Andrea Arcangeli**, revision of the work critically for important intellectual content, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; **Lucia Ercoli**, conception of the work, final approval of the version to be published, agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.


Disclosures

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Availability of Data and Materials

The data sets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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