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Research Article

Laryngeal Findings And Laryngopharyngeal Reflux In Open-Air Market Vendors: A Cross-Sectional Videolaryngoscopic Study.

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Abstract

Purpose: To describe laryngeal disorders among open-air market vendors and identify the most prevalent disorders, lesion types, affected laryngeal regions, and associated risk factors.
Methods: A descriptive cross-sectional study was conducted involving 49 open-air market vendors from Aracaju, Northeastern Brazil. Participants underwent structured interviews and videonasolaryngoscopic examination. Demographic, occupational, clinical, and laryngeal findings were analyzed descriptively.
Results: Women represented 63.3% of participants. Hoarseness was reported by 55% of the sample. Symptoms suggestive of laryngopharyngeal reflux were highly prevalent. Videolaryngoscopy revealed abnormalities in all laryngeal compartments, with the highest prevalence occurring in the posterior laryngeal and subglottic regions. Interarytenoid and retrocricoid edema and hyperemia, with or without pachydermia, were the predominant findings. Vocal fold cysts predominated among women, whereas vocal fold thickening and polyps were more common among men.
Conclusion: Open-air market vendors should be considered a distinct category of professional voice users. Laryngopharyngeal reflux was the most prevalent disorder and the posterior laryngeal/subglottic region was the most frequently affected site. Preventive occupational health measures focusing on vocal hygiene and reflux control are warranted.

Keywords: *Dysphonia; Occupational Voice; Voice Disorders; Laryngopharyngeal Reflux; Videolaryngoscopy; Occupational Health.*

INTRODUCTION

Voice disorders are common in the general population and occur even more frequently among individuals whose occupations require intensive voice use. Professional voice users are routinely exposed to prolonged phonation, elevated background noise, poor acoustic environments, unfavorable climatic conditions, and occupational stressors that increase the risk of vocal injury and dysphonia.1-4,17,18 Occupational voice disorders have been extensively investigated among teachers, singers, actors, telemarketers, clergy members, and healthcare professionals.5-9,17,18 These populations exhibit higher rates of dysphonia, vocal fatigue, phonatory effort, and benign vocal fold lesions than the general population. Since voice constitutes an essential work tool, voice disorders may substantially affect occupational performance, communication effectiveness, quality of life, and economic productivity.5-9,17-19,25

Open-air market vendors represent a unique category of professional voice users. Their occupational activities require continuous verbal interaction with customers, often under adverse environmental conditions characterized by elevated noise levels, dust exposure, heat, humidity fluctuations, and inadequate working infrastructure. Despite these conditions, the laryngeal health of this population remains largely unexplored.

Among professional voice users, common laryngeal disorders include laryngopharyngeal reflux, muscle tension

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dysphonia, vocal fold nodules, polyps, cysts, vascular lesions, granulomas, scarring, and mobility disorders.9-13,16,17 Videonasolaryngoscopy remains one of the most important diagnostic methods for identifying structural and functional laryngeal abnormalities associated with voice complaints.1-3 Laryngopharyngeal reflux has received increasing attention because of its association with chronic laryngeal inflammation, throat clearing, chronic cough, globus sensation, hoarseness, and phonatory fatigue.13-16,20,21,24 The interaction between reflux-related inflammation and occupational phonotrauma may contribute significantly to the development of laryngeal pathology in professional voice users.14-16,20,24

Recent evidence has demonstrated that cumulative vocal loading may induce transient and chronic laryngeal alterations even in vocally healthy individuals. Roque et al. demonstrated that intensive vocal loading may result in measurable videolaryngostroboscopic changes, reinforcing the concept that prolonged occupational voice use may induce structural and functional laryngeal alterations.6,22 Furthermore, prolonged phonotraumatic exposure has been associated with increased susceptibility to vascular lesions, vocal fold hemorrhage, and chronic laryngeal injury.7

Occupational voice disorders continue to represent an important challenge for public health systems worldwide. Reviews of occupational voice use consistently emphasize the need for preventive measures, vocal hygiene education, workplace adaptations, and multidisciplinary management strategies.8-13,17-19,23,25 Despite the growing body of literature concerning teachers, singers, and other professional voice users, studies evaluating open-air market vendors remain unavailable.

To our knowledge, no previous study has specifically investigated laryngeal disorders among open-air market vendors. Therefore, the present study was designed to describe laryngeal abnormalities in this population, identify the most prevalent disorders and lesion types, determine the laryngeal regions most frequently affected, and investigate factors associated with the observed videolaryngoscopic findings.

MATERIALS AND METHODS

This descriptive cross-sectional study employed a quantitative approach to investigate laryngeal disorders among open-air market vendors in the city of Aracaju, Sergipe, Brazil. The study was designed to describe laryngeal disorders in this occupational population and to identify the most prevalent laryngeal disease, the most frequent lesion type, the laryngeal region most commonly affected, and factors associated with the observed abnormalities.

The study population consisted of 49 open-air market vendors, including 18 men and 31 women, working in a public market. Because reliable demographic data regarding the total population of market vendors were unavailable, judgment sampling was adopted. All individuals willing to participate were included in the study. Inclusion criteria consisted of active work as an open-air market vendor and voluntary participation. Exclusion criteria included inability to provide reliable interview responses and the presence of acute upper respiratory tract infection.

Participants underwent a structured interview addressing demographic characteristics, occupational history, smoking habits, vocal symptoms, reflux-related complaints, and professional voice use. Following the interview, all participants underwent videonasolaryngoscopic evaluation. During the examination, participants were instructed to perform inspiratory and expiratory respiratory maneuvers and sustain the vowels /e/ and /i/ to facilitate laryngeal assessment.

Lesion location, anatomical extension, morphological characteristics, lesion multiplicity, and associated laryngeal abnormalities were systematically documented. The supraglottic, glottic, and subglottic compartments were evaluated in all participants.

The study was approved by the Research Ethics Committee of the Federal University of Sergipe under protocol CAAE 24061613.0.0000.5546. Data were analyzed descriptively using absolute and relative frequencies. Continuous variables were summarized as means and ranges when appropriate.

RESULTS

The study consisted of two distinct phases: a structured interview and videolaryngoscopic examination. Among the 49 evaluated participants, 31 (63.3%) were female and 18 (36.7%) were male. Participants ranged in age from 10 to 80 years. Regardless of sex, the highest proportion of individuals was observed in the 30-39-year age group. Interview findings demonstrated that 55% of participants considered themselves hoarse. The mean duration of hoarseness was approximately five years. The average duration of employment as a market vendor was 15 years, and participants worked an average of three days per week.

Symptoms suggestive of laryngopharyngeal reflux were highly prevalent among both sexes. Among female participants, 77.4% reported symptoms compatible with reflux disease, whereas 19.4% reported occupational voice difficulties, including vocal fatigue. Among male participants, 77.8% reported reflux symptoms, and 5.6% identified themselves as smokers. Symptoms associated with reflux disease represented the most prevalent complaints among the evaluated population. Among women, heartburn was the most frequently reported symptom, whereas throat clearing was the least common complaint. Among men, throat clearing was the most frequently reported symptom and dry cough the least common (**Figure 1**).

Figure 1. Distribution of self-reported symptoms suggestive of laryngopharyngeal reflux according to sex. Reflux-related symptoms were highly prevalent in both female and male participants. Heartburn was the most frequently reported symptom among women, whereas throat clearing predominated among men.

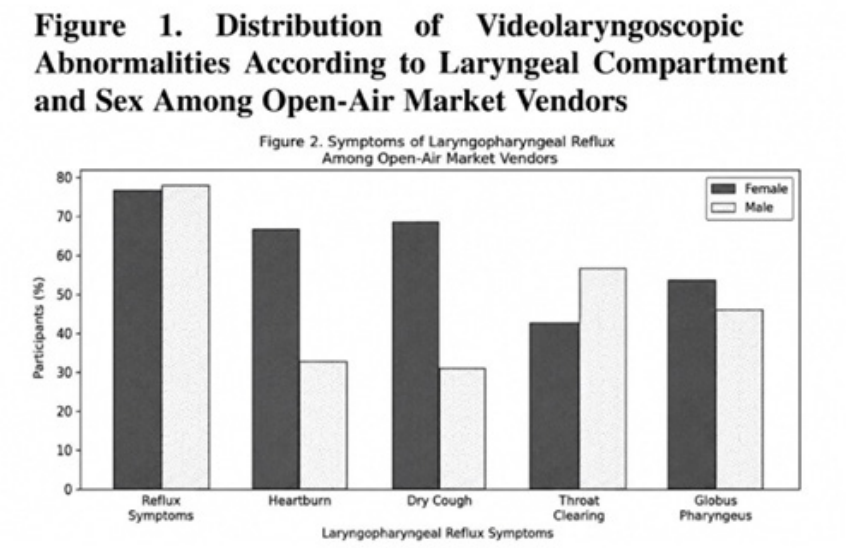


Figure 1. Distribution of videolaryngoscopic abnormalities according to laryngeal compartment and sex among open-air market vendors.

Videolaryngoscopic evaluation included systematic assessment of the supraglottic, glottic, and subglottic compartments. Abnormalities were identified in all laryngeal regions. The highest prevalence of pathological findings occurred within the subglottic compartment in both females (71.0%) and males (77.8%), suggesting a strong association between inflammatory laryngeal changes and occupational or behavioral risk factors. Videolaryngoscopic abnormalities were identified in all laryngeal compartments. The highest prevalence of pathological findings occurred in the subglottic compartment in both female (71.0%) and male (77.8%) participants. Glottic abnormalities were more frequent among women (45.2%) than men (11.1%), whereas supraglottic abnormalities were uncommon in both groups (**Table ; Figure 2**).

Supraglottic abnormalities were uncommon. Only one female participant (3.2%) presented a supraglottic lesion, characterized as ventricular fold hyperconstriction. Among male participants, two supraglottic abnormalities were identified: ventricular fold hyperconstriction and right ventricular eversion.

Table 1. Laryngeal Findings According to Laryngeal Compartment and Gender Among Open-Air Market Vendors in Aracaju, Sergipe, Brazil.

Laryngeal Compartment	Female n (%)	Male n (%)
Supraglottis	1 (3.2%)	2 (11.1%)
Glottis	14 (45.2%)	2 (11.1%)
Subglottis	22 (71.0%)	14 (77.8%)

Figure 2. Distribution of videolaryngoscopic findings according to laryngeal compartment and gender.

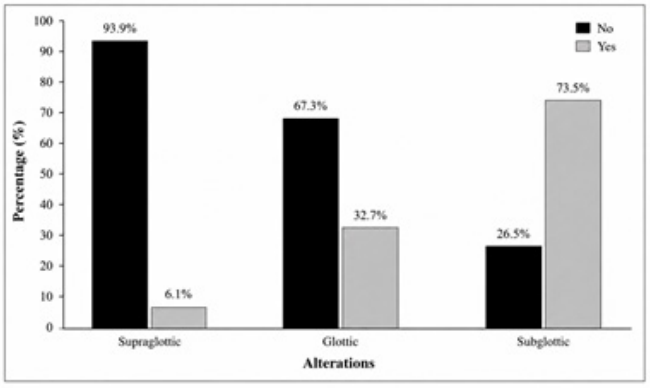


Fig. 1 Distribution of alterations by laryngeal site (supraglottic, glottic, and subglottic). The presence (*Yes*) or absence (*No*) of alterations is expressed as a percentage of the total sample ($n = 49$).

All participants demonstrated preserved vocal fold mobility and laryngeal sensitivity. Glottic abnormalities were identified in 45.2% of women and 11.1% of men. Among females, 60% of glottic lesions involved the right vocal fold, 30% involved the left vocal fold, and 10% were bilateral. Among males, lesions occurred equally in the right and left vocal folds, with no cases of bilateral involvement. Most lesions were confined to the middle third of the vocal fold.

DISCUSSION

The present investigation represents, to our knowledge, the first study specifically evaluating laryngeal disorders among open-air market vendors. The findings demonstrate a substantial burden of laryngeal abnormalities in this occupational population and reinforce the importance of considering market vendors as professional voice users exposed to significant occupational risk factors.

The predominance of female participants may reflect contemporary socioeconomic trends characterized by increasing female participation in the workforce. The presence of children and adolescents among vendors also suggests the persistence of child labor in this occupational setting. Most participants reported chronic hoarseness, a finding consistent with prolonged occupational voice use and phonotraumatic behavior. Similar observations have been reported in populations exposed to intense vocal demands and occupational stressors.17-19,23,25

Occupational voice disorders represent a global public health concern. Increased vocal demands associated with specific occupations significantly elevate the risk of dysphonia and may negatively affect communication efficiency, occupational performance, quality of life, and productivity.8,9,17-19,23,25 The high prevalence of hoarseness observed in the present study reinforces the importance of occupational vocal health programs directed toward underserved populations with intensive voice use.

Symptoms compatible with laryngopharyngeal reflux disease were highly prevalent among both sexes and were frequently accompanied by videolaryngoscopic findings of interarytenoid and retrocricoid edema, hyperemia, and pachydermia. These findings may be related to irregular eating habits, inadequate hydration, smoking, alcohol consumption, and prolonged working hours commonly observed among market vendors. Previous studies involving professional voice users have similarly identified reflux-related symptoms among the most common complaints reported by individuals exposed to high vocal demands.13-16,20,21,24

Recent consensus statements have emphasized that laryngopharyngeal reflux should be recognized as a distinct inflammatory disorder of the upper aerodigestive tract, characterized by a broad spectrum of laryngeal manifestations and requiring a multidisciplinary diagnostic approach.15,16,24

Most investigations involving professional voice users identify the glottic compartment as the primary site of pathology. In contrast, the present study demonstrated a predominance of inflammatory abnormalities involving the subglottic region. Recent videolaryngostroboscopic investigations have demonstrated that prolonged vocal loading may induce both transient and chronic laryngeal alterations, even among vocally healthy individuals.6,22 Furthermore, cumulative phonotraumatic exposure has been associated with increased susceptibility to vascular lesions, vocal fold injury, and hemorrhagic events.7 These observations support the hypothesis that chronic occupational vocal demands contribute substantially to the abnormalities identified in the present investigation.

The predominance of subglottic inflammatory changes suggests that laryngopharyngeal reflux and occupational phonotrauma may act synergistically in the development of laryngeal pathology among market vendors.14-16,20,21,24 The relatively low prevalence of supraglottic abnormalities may be explained by the lesser participation of supraglottic structures in voice production and their reduced exposure to the mechanical trauma associated with excessive phonation. In contrast, the subglottic compartment appears particularly susceptible to inflammatory changes associated with reflux disease.

One of the most important findings of this study is that the videolaryngoscopic pattern observed among market vendors differs substantially from those reported in teachers, singers, telemarketers, and other professional voice users. Whereas previous studies predominantly describe glottic lesions such as nodules, polyps, and edema, the present investigation demonstrated a predominance of inflammatory changes involving the posterior larynx and subglottic region. This finding highlights the importance of evaluating associated disorders, particularly laryngopharyngeal reflux disease, whenever occupational voice disorders are investigated.14-16,20,21,24

The originality of the study, the objective videolaryngoscopic assessment, and the identification of laryngopharyngeal reflux as a major associated disorder represent important strengths of this investigation. However, several limitations should be acknowledged. The sample size was relatively small, judgment sampling was employed because reliable demographic data regarding the vendor population were unavailable, and the cross-sectional design precludes causal inference. Additionally, objective reflux testing, such as 24-hour pH monitoring, was not performed, and a control group was not included. Despite these limitations, the study provides important preliminary evidence regarding laryngeal health among market vendors and establishes a foundation for future investigations involving larger populations and

analytical study designs. Future studies should consider objective reflux assessment, including impedance-pH monitoring, as recommended by recent international consensus statements.15,16,24

CONCLUSION

Open-air market vendors should be recognized as a distinct category of professional voice users because their occupational activities require sustained vocal use under adverse environmental conditions. Laryngopharyngeal reflux was the most prevalent disorder identified in this population, with pathological findings predominantly affecting the posterior laryngeal and subglottic regions. The observed abnormalities likely result from the combined effects of chronic occupational voice use, inadequate vocal behaviors, unfavorable dietary habits, and environmental exposures. These findings support the implementation of preventive occupational health strategies focused on vocal hygiene, reflux management, adequate hydration, environmental improvements, and early otolaryngological assessment. Future studies involving larger populations, control groups, and objective reflux testing are warranted to further clarify the relationship between occupational voice use and laryngeal disease in this underserved professional population.

Declarations

Funding

No external funding was received for this study.

Conflict of interest

The authors declare no conflict of interest.

Ethical approval

The study was approved by the Research Ethics Committee of the Federal University of Sergipe under protocol CAAE 24061613.0.0000.5546.

Informed consent

Written informed consent was obtained from all participants before enrollment.

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