



Commentary

## Voice Disorders Due to Hazardous Chemicals at Work Place

Abu Seif Hamad\*

Medical doctor, GP at The Jordanian Ministry of Health, Department of Occupational Health, Jordan

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Employee exposure to harmful dust, heat, noise and hazardous chemicals might cause several occupational diseases and voice disorder is one of them. There is a limited research on vocal health and safety in workplaces. In addition, there's a scarcity of awareness among employees and employers about vocal health and safety within the working environment. Work-related voice disorders might cause sick leaves, stress, low productivity and in severe cases a permanent damage to the voice. Our study aimed to detect work-related voice disorders in chlorine manufacturing industry, and to enhance vocal health and safety among employees in industrial workplace.

The human voice is essential to communication both at work and socially. Sounds are produced by vibration of the vocal cords, two bands of smooth muscle tissue that align in the larynx. At rest, the vocal cords are open to allow air entry, the brain then coordinate a series of events causing the cords to come together and sieve air from the lungs, leading to vibration and sound. The sound then travels through the throat, nose and mouth, which act as resonating cavities. The noise that is produced is determined by the size and shape of the cavities and vocal cords.

Variety within an individual voice is a result of lengthening or shortening, tensing or relaxing the vocal cords. The most common disorder of the cords in an occupational setting is laryngitis, although the development of nodules, polyps and contact ulcers are also seen in those who misuse or abuse their voices. Laryngitis produces a voice that is described as raspy, breathy and hoarse. This type of sound can be produced not only by chemical irritants, but also by bacterial or viral infections or by excessive use of the voice, a condition known as vocal hyper function. It is hard to imagine professional voice users such as lawyers, barristers, lecturers, actors and aerobics teachers being able to function effectively without speech. Indeed, there

are very few occupations where an individual can be fully effective without the use of their voice. The importance of the voice as an occupational tool is growing with the development of voice-activated technology and the increase in the number of individuals working in call centre environments, where vocal demands are high. In this latter group, it has been estimated that currently 1.6–2% of the UK working population work in such centres, and this is destined to grow over the next 5 years(Call Centre Association, personal communication), thus increasing the likely interest in the effects of work on voice health and of voice health on work.

Fifty employees in chlorine manufacturing industry were examined using the occupational health assessment followed by a voice assessment. The study identified the influencing factors for work-related voice disorders in chlorine manufacturing industry like level and time of exposure and rest time during work. The types of voice disorders and therefore the perceptual vocal characteristics were identified for every employee also because the acoustic data of the voice. In addition, the effects of work-related voice disorders on the working environment were studied.

The aim of this presentation is to highlight the importance of examining vocal health and safety among employees in industrial work-places, and referring those with occupational voice disorders to voice therapy. Employees who are at risk of occupational voice disorder can follow a preventive vocal hygiene program and employers might consider enhancing the working environment and the level of awareness about vocal health and safety and following rules and regulations of health and safety in industrial work-place.

**Corresponding Author:** Abu Seif Hamad abuhamad@gmail.com Medical doctor, GP at The Jordanian Ministry of Health, Department of Occupational Health, Jordan.

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Definitions of work-related voice disorders or vocal injuries may vary across geographical location according to relevant legislation, terminology and context. Yet, any speech pathologist understands the enormity of the occupational voice-user population whereby voice may be a critical occupational tool and no voice equals no work today singers, stage performers, sports coaches, sales assistants, teachers, lecturers, lawyers, telephone operators, call center workers, receptionists, priests and health professionals. Speech pathologists witness first-hand the acute financial repercussions of voice disorders also because the impact on social and professional identity.

There is a longstanding assumption of a causal relationship between heavy voice-use and the development of voice problems. More recent research however, suggests that the connection is more complex. There are people working in heavy voice-use occupations who do not experience vocal difficulties. Many other environmental and contextual factors (coined voice ergonomics) have been proposed to exert

an effect. There has been a shift toward the exploration of these occupation-specific environmental factors as well as person factors, such as vocal fitness, as determinants of vocal survival in the workplace especially for those with sustained heavy load.

The impact of the disordered voice on standard work productivity measures and employment trends is difficult to quantify; this is often in large part thanks to the heterogeneity of the disease processes. Spasmodic dysphonia (SD), a chronic voice disorder, could also be a useful model to review this impact. Self-reported work measures (worked missed, work impairment, overall work productivity, and activity impairment) were studied among patients receiving neurotoxin (BTX) treatments for SD. It was hypothesized that there would be a substantial difference in work-related measures between the best and worst voicing periods. In addition, job types, employment shifts, and vocal requirements during the course of vocal disability from SD were investigated for each individual, and the impact of SD on these patterns was studied.