

Work environment discomfort and injury: an ergonomic survey study of the American Society of Pediatric Otolaryngology members ☆, ☆ ☆

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Received 2 September 2011

Abstract

Background: Workplace-related musculoskeletal pain has been studied in various occupations, but it is rarely reported in the surgical literature.

Objective: The aim of this study was to examine work-related discomfort and injury among pediatric otolaryngologists and to assess their knowledge of workplace ergonomic principles.

Methods: We surveyed current North American members of the American Society of Pediatric Otolaryngology. Our main outcomes were whether the physician had ever experienced discomfort or physical symptoms that they attributed to their surgical practice.

Results: Response rate of 43.7% was attained, and 62.0% of respondents reported experiencing pain or discomfort that they attributed to their surgical practice. Women were significantly more likely to report experiencing pain or discomfort that they associated with their surgical practice ($P = .033$). There were no significant differences found among length of time in practice, academic vs community setting, or number of surgeries completed by the surgeon. Some of the surgeons (31.0%) were aware of ergonomic principles, and of those who were aware, 83.9% had implemented ergonomic principles into their surgical practice.

Conclusion: Almost two thirds of surgeons who responded to the survey reported experiencing pain or discomfort that they attributed to their surgical practice. Only a minority of respondents were aware of ergonomic principles. These findings may confirm that most physicians believe that their physical health is affected by their operative environment. Increased knowledge of surgical ergonomics may lead to strategies that improve workplace health and safety.

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1. Introduction

Ergonomics is a relatively new scientific discipline concerned with the understanding of interactions among humans and other elements of a system. It is the profession that applies theory, principles, data, and methods to design to

optimize human well-being and overall system performance [1]. Ergonomic analyses are widely applied today in industry [2], the military [3], and sports training [4] to help people achieve optimum performance while lowering the risk of error and injury.

Industrial ergonomics is applicable to surgical practice because it is well recognized that both static and dynamic postural stresses can lead to fatigue and disability [5,6]. The National Institute of Occupational Safety and Health (NIOSH) recommendations for workstation design include the following: avoiding static loads, reducing fixed work postures, avoiding postures that include leaning to the front or to the side, holding a limb in a bent or extended position, and neck forward positions of more than 15° [7]. Repetitive

☆ The authors have no financial disclosure or conflicts of interest.

☆☆ This material has never been published and is not currently under evaluation in any other peer-reviewed publication.

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motion injuries have also been described as the most frequent and disabling injuries involving medical professionals [8]. These principles prove difficult to comply with in an operating room setting, leaving surgeons at risk for work-related injury, pain, and discomfort complaints.

Generally, surgeons tend to adopt operative positions based on their training and personal preferences as opposed to ergonomically guided principles. Kant et al [9] studied the posture of physicians and nurses while performing surgical procedures and found that both groups experienced substantial stress to the musculoskeletal system due primarily to the frequent and prolonged static head-bent and back-bent postures assumed. More recently, Park et al [10] surveyed 317 surgeons who performed laparoscopic procedures and found 86.9% reported physical complaints or discomfort related to their practice.

Musculoskeletal disorders have been studied throughout various health care occupations. The higher incidence of occupational cervicobrachial disorders among dentists has prompted improved designs of dental operative equipment and dentist positioning [11]. However, studies among surgeons, particularly otolaryngologists, are rare [12–15]. One study in the United Kingdom found that 72% of otolaryngologists surveyed had either back pain or neck pain [15]. There were no North American studies found in the literature that described the incidence of pain and discomfort associated with pediatric otolaryngology surgical practices. It is for this reason that we conducted an ergonomics survey study among the North American pediatric otolaryngologists, with the aim to investigate the prevalence of workplace-related discomfort and injury and to assess their knowledge of workplace ergonomics principles.

2. Methods

North American members of the American Society of Pediatric Otolaryngology (ASPO) were contacted for this study. An e-mail list of the current ASPO members with an active surgical practice was included in the study. Physicians practicing pediatric otolaryngology but who were not ASPO members and ASPO members who did not have a surgical practice were excluded from the study.

Physicians were surveyed between June and November of 2010. The survey was delivered via their contact e-mail using an online survey system. To promote a higher response rate, 3 iterations of the same survey were sent out.

For the survey, the questionnaire used by Park et al [6] to assess ergonomic knowledge and practice among general surgeons was partially adapted. The survey and some of the questions were altered to better represent a pediatric otolaryngology practice. The survey was pretested on medical postgraduate students, faculty physicians, occupational therapists, and ergonomists. Fig. 1 shows the survey used in this study.

Pediatric Otolaryngology Ergonomics Survey

Demographics

1. What is your age? _____
2. What is your height (cm)? _____
3. What is your gender? _____
4. What is your dominant hand? _____
5. How many years have you been practicing? _____
6. What is your type of practice? (Please circle) Academic or Private Practice
7. Are you fellowship trained? (Please circle) Yes or No
8. How many of the following cases do you perform in a year?
 - Minor microscopy cases (e.g. tympanostomy tube, myringoplasty) _____
 - Major microscopy cases (e.g. mastoidectomy, microvascular) _____
 - Minor endoscopy cases (e.g. diagnostic bronchoscopy) _____
 - Major endoscopy cases (e.g. FESS) _____

Physical Symptoms

1. Have you ever had any discomfort or physical symptoms that you would attribute to your surgical practice? (Please circle) Yes or No
2. a. If you answered yes, which of the following apply? (Please circle)
 - Numbness _____
 - Stiffness _____
 - Fatigue _____
 - Pain _____
 b. Which body part(s) has been affected? _____
 c. Are these symptoms localized or radiating? _____
3. Please describe any other injuries or conditions that were not listed above that you would attribute to your surgical practice. _____
4. Have you ever received therapy or treatment for the injuries or conditions? (Please circle) Yes or No
 - a. If yes, has this therapy improved the condition? _____
 - b. If yes, has this condition been remedied? _____
5. When do these symptoms or discomforts affect you the most? _____
6. How have you attempted to minimize these problems? _____
7. Have you ever required surgery for your injury or condition? _____
 - a. If so, what was the outcome? _____
8. Does this limit your practice?
 - a. If yes, what procedure is most difficult to perform? _____
 - b. If yes, is it still problematic? _____

Ergonomics

1. Are you aware of the recommendations made by the field of surgical ergonomics, its studies and research? (Please circle) Yes or No
2. If yes, where did you acquire this information? (Please circle)
 - Word of mouth _____
 - Internet search _____
 - Conference or meeting _____
 - Others: _____
3. Have you applied any of this information to your surgical practice? Yes or No
 - a. If yes, what were the results? _____
4. a. Would you like more information regarding surgical ergonomics? (Please circle) Yes or No
 - b. If yes, what format would you prefer? (Please circle)
 - Newsletters _____
 - Website _____
 - Sessions or courses _____
 - Other: _____

Fig. 1. Pediatric otolaryngology ergonomics survey.

The questions were grouped into 4 categories: (1) demographics, (2) surgical practice characteristics, (3) physical symptoms, and (4) ergonomics. Some questions required single answers, such as “Have you ever had any discomfort or physical symptoms that you would

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