

SHORT ARTICLE

Prevalence and risk factors for neck pain among support staff of tertiary care centre

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Abstract

Background: Work related neck pain (WRNP) is common among professionals. Its cause is multifactorial and results in loss of productivity and avoidable morbidity. **Aims & Objectives:** To estimate the prevalence and risk factors of WRNP among the support staff of a tertiary hospital. **Material & Methods:** 558 support staff were randomly selected to estimate the prevalence of neck pain. Staff with severe WRNP were then included in a nested case control study to identify risk factors. **Results:** 37% of workers reported neck pain in the preceding 3 months. Female gender, improper posture, jobs requiring repetitive movements, perception of decreased job control, high body mass index and psychosocial stress were identified as the significant risk factors. **Conclusion:** Better ergonomics, improving the perception of job control and encouraging micro breaks during the work time may decrease WRNP.

Keywords

Ergonomics; Musculoskeletal Diseases; Work Related Neck Pain; Risk Factors

Introduction

Work related musculoskeletal disorders are the most common self-reported problems from office workers to manual material handlers. Studies show that 36-56% of workers have CANS (complaints of arm, neck and shoulder). (1) With increasing use of information technology, about 20% of the staff have desk-based

jobs and are therefore increasingly at risk of CANS. We aimed to estimate the prevalence of WRNP and risk factors contributing to it in a healthcare setting so as to implement workplace interventions that effectively address the issue of WRNP among its staff.

Aims & Objectives

1. To study the prevalence of neck pain among support staff working in a tertiary care hospital.
2. To identify potential risk factors for severe WRNP among support staff working in tertiary care hospital.

Material & Methods

Support services staff including technicians, pharmacists, record keeping services and administrative staff in our hospital were included after obtaining a written informed consent. A cross-sectional study was done to assess the prevalence of neck pain followed by a case control study to identify the risk factors for severe WRNP. A self-administered questionnaire was used to identify staff with neck pain (pain or discomfort in neck or upper back between occiput and third thoracic vertebra in the last 3 months). Detailed evaluation of pain along with physical examination was done for those who reported with neck pain in the preceding 3 months with regards to duration, aetiology and severity. Staff with degenerative, inflammatory, infectious and traumatic causes of neck pain were excluded. Those confirmed to have severe WRNP were selected for the case control study.

WRNP was defined as a person with complaints of pain, ache or discomfort in the neck and/or interscapular region between occiput and third thoracic vertebra. This person should have had two or more episodes of neck pain in the last 3 months with at least one episode lasting for 4 days or more. The neck pain should have been increased with work and relieved after taking rest and severe enough to seek medical care or analgesics.

Age-matched staff who reported no neck pain in the cross-sectional study were selected as controls using a frequency matching procedure.

Risk factors for WRNP were assessed using a customized questionnaire incorporating risk factors from Maastricht upper extremity questionnaire and a psychosocial stress questionnaire. (2) Evaluation of work station was done using the Occupational Safety and Health Administration standards check list. (3) Data on the subject's age, body mass index, number of working hours spent at a computer, repetitive movements with the upper limb, recreational physical activity, details on job control, job demand, break time, work schedule, and autonomy at work were collected. Symptoms of anxiety and depression were identified using the flag signs. A visual analogue

scale rating the level of noise, light and work space was used to assess the overall physical environment of the work place. Knowledge of good posture was assessed using a set of six pictures, with one good and five poor postures.

Participant's posture at workplace was assessed by the principle investigator. Participant was considered to have a good posture if staff has head and neck faced forward, not twisted, upright or in line with the body without bending down or backwards, shoulder and upper arms in line with the body, relaxed and perpendicular to the floor and not elevated or stretched and upper arms and elbow were close to the body and not extended.

History of co-morbid conditions like diabetes, hypertension, dyslipidaemia, hypothyroidism and pain in other regions was noted.

Sample size and sampling:

The prevalence of neck pain was estimated at 15%, based on the staff health clinic records. With a relative precision of 20% and an anticipated non-response rate of 5% the sample size was estimated as 600. The case control study was designed to provide 80% power at a 5% probability of type I error, using a two-sided test of significance, to detect three times increase in odds of severe WRNP among those working with a computer. (4) The sample size was calculated as 39 cases and 117 controls.

Mean and standard deviation was calculated for continuous variables and categorical variables were presented as percentages. Association of risk factors was assessed using odds ratio and 95% confidence interval. Multivariate analysis was done using binary logistic regression model incorporating significant exposure factors. Adjusted ORs with 95% CI and two-sided tests of significance were calculated. Analysis was done using the SPSS Version 17.0. (5) The study was approved by the institutional review board.

Results

Among 1654 staff in the target population, 600 were randomly selected. Among those selected, 558 participated in prevalence study and they were almost equal number of men and women in all age groups. There were technicians 201(36%), administrative staff 181(33%), computer terminal operator 91(16%), pharmacist 56(10%) and support services staff 29(5%).

Prevalence and severity of neck pain:

Episodes of neck pain were reported in 206 (36.9%) of the 558 staff screened. No definitive medical

cause was identified in 185 (90%) of those with neck pain. Women were significantly 121 (44.9%) more likely to report neck pain than men 85 (29.4%) (P value <0.01) and 44 met the case definition for work related neck pain

The baseline characteristics of the participants in the case control study are shown in (Table 1). A bivariate analysis of the various risk factors as shown in (Table 2) revealed that women were more likely to have neck pain. A lack of job control, having an uncomfortable physical environment, feeling tired at the end of the day, having a poor posture while working, performing repetitive movements, having anxiety and being overweight were found to be associated with severe WRNP.

Stratified analysis was performed to look if working with computer was an effect modifier. The perception of a lack of job control was higher among those working with computer for more than 3 hours a day with OR 7.26 as compared to those who work 3 hours or less where the OR was 2.58 suggesting a potential interaction between perception of job control and duration of working with computers. Similarly, obesity might be a greater risk factor for severe WRNP among those who do not use computers for more than 3 hours a day (7.24 vs 1.41). Mantel-Haenszel odds ratio failed to show any marked difference from the unadjusted odds ratio indicating there was no substantial confounding.

A multivariate analysis done with working with computers for more than 3 hours as the primary explanatory variable and other significant risk factors. It revealed that working for more than 3 hours a day with computer when adjusted for covariates is associated with WRNP, with OR 1.66(CI 0.56-4.93) P=0.36, while Female gender with OR 4.11(CI1.53-11.02) p<0.01, lack of job control with OR 4.24(CI 1.6-11.16) p<0.01, overweight with OR 3.21(CI 1.17-8.80) p<0.01. Working with computer which was significantly associated with WRNP in the bivariate model, was no longer significant.

Discussion

With the advent of hospital information systems, use of computers has been inevitable and is an emerging concern. The prevalence of neck pain in this study is 36.9% which is consistent with study done in similar settings in a tertiary hospital in North India.(6)

Jobs that require repetitive movements like typing were significantly associated with severe WRNP (OR: 5.14). Similar findings has been observed in a study

done (7) among the visual display terminal users (VDU) found repetitive movements to be associated with WRNP with an OR of 5.5.

Improper work station design increases the biomechanical stress on the musculoskeletal. Work posture especially among those using computers was observed to be a significant risk factor for WRNP (OR 8.83) and this has been seen in other studies as well.(6,8)

Staff with higher BMI was more likely to have WRNP (OR 2.44). These results are consistent with the other studies like the study by Viester L *et al* where obesity was associated with neck pain (OR 1.12). (6,9) Study by Hooper MM *et al* has also shown that reduction in BMI was beneficial in reducing neck pain. (10)

Uncomfortable physical work environment was found a significant risk factor for WRNP with an OR of 2.13. Lighting and work space can be modified but reducing noise in crowded settings such as patient waiting areas are challenging.

Also, WRNP pain has been associated with both decreased job control (OR 4.61), increased job demand (OR 3.20) and anxiety (OR 2.25). Stress and psychosocial work factors may increase the biomechanical load and increase WRNP. (11)

Conclusion

The prevalence of neck pain among support staff in this tertiary care hospital was 36.9%. Women and those with a BMI of more than 25, lack of job control, poor posture, working with computer and repetitive movements were found to be risk factors for developing WRNP. When the multivariate model was applied working with computer for more than 3 hours was not a significant risk factor for WRNP. In this era of utilisation of computer technology, maintaining good posture and increasing job control will reduce the WRNP and improve the productivity. Employees need to be educated on good postures.

References

1. Ranasinghe P, Perera YS, Lamabadusuriya DA, Kulatunga S, Jayawardana N, Rajapakse S, *et al*. Work related complaints of neck, shoulder and arm among computer office workers: a cross-sectional evaluation of prevalence and risk factors in a developing country. *Environ Health Glob Access Sci Source*. 2011;10:70.
2. Eltayeb S, Staal JB, Kennes J, Lamberts PH, Bie RA de. Prevalence of complaints of arm, neck and shoulder among computer office workers and psychometric evaluation of a risk factor questionnaire. *BMC Musculoskelet Disord*. 2007 Jul 14;8(1):68.
3. OSHA Ergonomic Solutions: Computer Workstations eTool - Workstation Environment [Internet]. [cited 2013 Dec 16].

Available from: https://www.osha.gov/SLTC/etools/computerworkstations/wkstation_enviro.html

4. Ariëns GA, van Mechelen W, Bongers PM, Bouter LM, van der Wal G. Physical risk factors for neck pain. *Scand J Work Environ Health*. 2000 Feb;26(1):7-19. Review. PubMed PMID: 10744172. [PubMed].
5. Statistics for Windows, Version 17.0. Chicago: SPSS Inc.
6. Darivemula SB, Goswami K, Gupta SK, Salve H, Singh U, Goswami AK. Work-related Neck Pain Among Desk Job Workers of Tertiary Care Hospital in New Delhi, India: Burden and Determinants. *Indian J Community Med*. 2016 Jan-Mar;41(1):50-4. doi: 10.4103/0970-0218.170967. PubMed PMID: 26917874; PubMed Central PMCID: PMC4746955. [PubMed]
7. El-Bestar SF, El-Mitwalli AA-M, Khashaba EO. Neck-upper extremity musculoskeletal disorders among workers in the telecommunications company at Mansoura City. *Int J Occup Saf Ergon JOSE*. 2011;17(2):195-205.
8. Schnoz M, Läubli T, Krueger H. Co-activity of the trapezius and upper arm muscles with finger tapping at different rates and trunk postures. *Eur J Appl Physiol*. 2000 Oct;83(2-3):207-14. PubMed PMID: 11104062. [PubMed]
9. Viester L, Verhagen EA, Hengel KMO, Koppes LL, Beek AJ van der, Bongers PM. The relation between body mass index and musculoskeletal symptoms in the working population. *BMC Musculoskelet Disord*. 2013 Aug 12;14(1):238.
10. Hooper MM, Stellato TA, Hallowell PT, Seitz BA, Moskowitz RW. Musculoskeletal findings in obese subjects before and after weight loss following bariatric surgery. *Int J Obes*. 2006 Apr 25;31(1):114-20.
11. Josephson M, Pernold G, Ahlberg-Hulten G, Harenstam A, et. Differences in the association between psychosocial work conditions and physical work load in female- and male-dominated occupations. *Am Ind Hyg Assoc J*. 1999 Oct;60(5):673-8

Tables

TABLE 1 THE BASELINE CHARACTERISTICS OF THE PARTICIPANTS IN THE CASE CONTROL STUDY

Variables	Job Category	Cases N= 43	Controls N= 124
Mean age (SD)		39.14 (7.67)	39.44 (7.80)
BMI (SD)		26.73 (4.15)	24.95 (4.43)
Descriptions (%)	Technician	14 (32.6%)	39 (31.5%)
	Administrative staff	16 (37.2%)	43 (34.7%)
	Medical records and computer operators	9 (20.9%)	23 (18.5%)
	Pharmacist	2 (4.7%)	12 (9.7%)
	Support service staff	2 (4.7%)	7 (5.6%)

TABLE 2 RISK FACTORS FOR SEVERE WORK-RELATED NECK PAIN

Risk factors	Case	Control	Odds ratio	95%CI
Gender Female	27 (62.8%)	41 (33.1%)	3.41*	1.66-7.04
Age ≥ 39 years	23 (53.5%)	66 (53.2%)	1.01	0.50-2.03
>3 hours of work with computer (n=121)	31 (86.1%)	53 (62.4%)	3.74*	1.32-10.60
Lack of job control	32 (74.4%)	76 (38.7%)	4.61*	2.12-9.99
Insufficient break time	12 (27.9%)	25 (20.2%)	1.53	0.69-3.40
Uncomfortable physical environment	25 (58.1%)	49 (39.5%)	2.13*	1.05-4.30
Feeling tired at the end of the day	33 (76.7%)	63 (50.8%)	3.20*	1.45-7.04
Increased job demand	13 (30.2%)	47 (37.9%)	0.71	0.34-1.50
Increased psychosocial stress	23 (53.5%)	64 (51.6%)	1.09	0.54-2.16
Poor posture (n=152)	38 (90.5%)	57 (51.8%)	8.83*	2.95-26.43
Overweight (BMI> 25)	29 (67.4%)	57 (46%)	2.44*	1.17-5.05
Repetitive movements	35 (81.4%)	57 (46%)	5.14*	2.21-11.97

*Indicates statistically significant association