ORIGINAL ARTICLE

ASSESSMENT OF NATURE AND TYPE OF REPETITIVE STRAIN INJURY AMONG SOFTWARE PROFESSIONALS

Satish Saroshe[1], Suraj Sirohi[2], Amitsingh Pawaiya[3], Gunjan Taneja[4]

[1]Assistant Professor; [2]Resident, Department of Community Medicine, M.G.M Medical College, Indore; [3]Resident, Department of Community Medicine, RD Gardi Medical College, Ujjain; [4]Technical Officer, MCHIP, Ranchi

Correspondence: Dr. Satish Saroshe, Email: drsatishsaroshe@gmail.com

ABSTRACT

Introduction: Repetitive strain injury RSI, also known as WRULD (work related upper limb disorder), is a term used to denote a group of injuries affecting muscle, tendons and nerves affecting neck and upper limbs.

Objectives: The study was conducted to assess nature, type and awareness of RSI among software professionals.

Methodology: Cross sectional study was carried out using predesigned semi structured questionnaire to assess nature and type of RSI in software professionals.

Result: - Symptoms of 74% software professionals fall into the category of RSI. 86.5% subjects were having more than 10 years experience. 69% subjects complain of poor posture. 83% subjects agreed of using towel roll or any back support. 55% subjects were involved in subconscious frequent self massage. Average weight of all the professionals were 73 Kg and average height was 5'8", thus the average BMI was 24.47 making all professionals overweight.

Conclusion: RSI is invariably being faced by software professionals. It is definitely causing physical and mental morbidity to software professionals. A large multicentric study is needed to corroborate the findings.

Keywords: RSI (repetitive strain injury), WRULD, software professionals, computer

INTRODUCTION

Repetitive Strain Injury (RSI) (also known as Work Related Upper Limb Disorder (WRULD) or occupational overuse syndrome[1]) is a group of injuries affecting the muscles, tendons and nerves primarily of the neck and upper limbs. It incorporates activity-related arm pain such as tendinitis, cubital tunnel syndrome, thoracic outlet syndrome, DeQuervain's syndrome, stenosing tenosynovitis, and focal dystonia[2]. It is caused by repeated overuse and injury to the muscles of the hands, wrists, arms or shoulders[3]. At work, the computer keyboard and mouse are often implicated[4].

There are two types of RSI[5]:-

- Specific Named Conditions - carpal tunnel syndrome, tennis elbow, etc.
- Diffuse RSI - this is where there is no clear-cut diagnosis but a range of symptoms exist.

This study was conducted to assess the level of awareness and Knowledge, Attitude, Practice (KAP) regarding RSI on software professionals and also to assess the nature and type of RSI with which these professionals are affected.

METHODOLOGY

It was a Cross sectional study conducted at four different software companies of Indore district. The calculated sample size was 200 (50 software professionals each of these four companies); Survey System Software was used to calculate the sample size assuming the total population of Software professionals of 4 companies in Indore as 1000 with 95% confidence interval of 95%.

Sequential sampling was adopted as sampling technique. Non-probability Sequential sampling technique wherein the author picked 50 subjects who fulfilled the inclusion criteria from one software company, conducted the study, and then picked next software company and so on. All software professionals who were in the industry for ≥ 5 years were included in the study.

A Pre designed, Pre tested, Semi structured questionnaire was used as a study tool to collect data. Data was analysed using MS Excel and SPSS software.

Written informed consent was obtained from study subjects after prior permission from designated authorities.

RESULT

All the 200 (100%) subjects have sedentary nature of job, 123 (61.5%) subjects were males and 77 (38.5%) females. 167 (83.5%) subjects were having more than 10 years of experience. 179 (89.5%) subjects complain of any pain of upper limb and neck after joining the present job. Out of which 148 (74%) fall in the category of RSI.

Table 1: Age group of study participant (N=200)

Age in Years	Study subjects (%)
20-24	7 (3.5)
25-29	68 (34)
30-34	43 (21.5)
≥35	82 (41)

138 (69%) complain of poor posture and 83 (41.5%) agreed of using towel roll or any back support. The average hours of computer/desktop/laptop use per day is 8 hours while average hours of sleep is 6 hours and average hours of television viewing is 3 hours. On an average 100% study subjects work for 4 hours continuously at stretch after which there is break of 1 hour and then they work for 4 hours.

Table 2: Years of experience of software professionals in the job (N=200)

Years of Experience	Study subjects (%)
5	7 (3.5)
6-10	26 (13)
11-15	74 (37)*
>16	93 (46.5)*

*167 (83.5%) subjects were having more than 10 years of experience;
7 subjects have exact 5 years of experience.

Merely 72 (36%) were exercising regularly and ironically only 56 (28%) indulged in brisk walking for 15 minutes per day. 110 (55%) were involved in sub conscious frequent self massage.

Table 3: Knowledge, Attitude, Practice (KAP) regarding RSI among study subjects (N=200)

Characteristics of subjects	Subjects(%)
Complain of any pain associated after joining	179 (89.5)
Having any Complaints fall under category of RSI	148 (74.0)*
Doing exercise regularly per day	72 (36.0)
Doing brisk walking for 15 minutes daily	56 (28.0)
Complaining of poor posture	138 (69.0)
Using towel roll/any back support	83 (41.5)
Having sub conscious frequent self massage	110 (55.0)

*148 (74%) fall in the category of RSI

All of the professionals agreed of constant ache associated with typing and clicking the mouse repeatedly. Average weight of all the professionals were 73 Kg and average height was 5'8", thus the average BMI was 24.47.Thus 100% professionals fit into the category of overweight (A person with a body mass index of 23 kg/m2 will now be considered overweight and below that as one with normal BMI—unlike the cut-off limit of 25 kg/m2 earlier as per the guidelines released jointly by the Health Ministry, the Diabetes Foundation of India, the All-India Institute of Medical Science (AIIMS), Indian Council of Medical Research, the National Institute of Nutrition).

Almost 100% of study subjects have agreed to face the problem of using keys and brushing teeth in the evening hours. 100% subjects have the tendency of holding the phone between neck and shoulder and 100% subjects sleep while sitting on chair with head hanging forward.

Table 4: Average hours of ADL (Activities of Daily Life) by total Subjects (software professionals) suffering from RSI (N=148=suffering from RSI)

Particular	Average hours of RSI
Average hours of computer/ desktop/ laptop work per day	8 hours
Average hours of sleep per day	6 hours
Average of television viewing per day	3 hours
Average hours of continuous working per day- 4 hours*	4 hours

*4 hours working then 1 hour break and then 4 hour working

None of the professionals is suffering from chronic arthritis, hypertension or diabetes mellitus.

DISCUSSION

Study was being carried out in 200 software engineers to assess the nature and type of RSI among them. The symptoms of RSI included aches, pain, swelling, numbness, tingling, weakness and cramps[6]. 100% (148 out of 200) software professionals were suffering from diffuse RSI. Diffuse RSI - conditions are where the patient complains of pain and yet, on examination by a health care professional, nothing physical can be found to be wrong.[7] With diffuse RSI there are usually no visible signs. Specific type of repetitive strain injuries which includes Tendonitis, Tenosynovitis, Carpal Tunnel Syndrome, De Quervain's Disease, Bursitis, Epicondylitis, Trigger Finger, Ganglion Cysts, Herniated Disc, Degenerative Disc Disease, Hand-Arm Vibration Syndrome were not found in any of the software professionals[8]. Some authors have classified the types as - Type 1 RSI – A recognised medical condition usually characterised by swelling and inflammation of the muscles or tendons and Type 2 RSI –non-specific pain syndrome.[9]

Symptoms of RSI may take months, even years, to appear. Initially, only a slight ache may be felt. As the problem gets worse, there's more marked pain while performing the repeated activity - when typing, for example. One or both upper limbs may be affected, depending on which is used to perform the activity responsible for the problem. As well as the pain, numbness and tingling may make holding objects difficult. The risk of RSI is increased by spending long periods without a break, sitting on an uncomfortable seat, at a poorly arranged workstation[6]. McKenzie et al. from the Centre for Injury Research and Policy and The Research Institute at Nationwide Children's Hospital Ohio State University College of Medicine, in a paper published in the July issue of the *American Journal of Preventive Medicine* have stated that "We already have a quite a lot of documented evidence about the hazards of long term computer-related health problems like back injury, blurred vision and repetitive strain (e.g. from prolonged use of the mouse), but this latest study revealed for the first time a surprising seven-fold increase over the last decade or so in sudden computer-related injuries".[10] Following steps have been recommended to avoid RSI:-

1. Neutral Wrist Position- When one types, the wrists should be in a neutral position, not bending the wrist towards little finger, nor bending it toward the thumb. Also be careful not to type with the wrist bent upwards towards you. This is known as dorsiflexion. It's particularly easy to do this if the keyboard is badly adjusted, or at the wrong height. Typing with the wrists in any position other than the neutral position puts additional strain on the tendons and sheaths, and increases the risk of repetitive strain injury.

2. Correct keyboard adjustment- The correct keyboard adjustment is one where the keyboard is flat and at or below elbow level. This position makes it easiest to type with wrists in the neutral position. If the keyboard is not at the correct height, one should choose the adjustment which keeps the wrists as near to the neutral position as possible.

3. Reduce mouse usage- Cut down on the mouse usage by using keyboard shortcuts instead. If one switches mouse hands, it takes about a week to become ambidextrous as far as the mouse is concerned. However, there is still a probability to get RSI in the other hand and have two sore wrists instead of one.

4. Regular Breaks- For RSI prevention, one should take five minute break after every 20-30 minutes of continuous activity. If someone is suffering from RSI s/he should clearly take it more frequent and longer.

5. Sit with Straight Posture- Bad posture is a primary risk factor in RSI. One should try to sit up straight, rather than leaning forward over the keyboard. The display should be adjusted so that the monitor is directly in front of eyes, with the top of the screen at eye level except if one wears bifocal glasses. If one wears bifocals, s/he may need the screen slightly lower down so that s/he can focus on the screen through the correct part of one's glasses without straining the neck.

CONCLUSION

RSI is a definite problem which is being faced by professionals associated with software industry. The morbidity caused by RSI is definitely hampering the physical and mental health of these individuals thus adversely affecting the quality of industry output. A large multicentric study of this sort is recommended.

LIMITATION

Since the sample size is small (200) due to financial constraints, we strongly recommend to carry out the multicentric study with better financial resources.

RECOMMENDATION

Based on the present study it is recommended to have specific guidelines for computer related work, frequent brisk while working, introduction of ergonomic changes and some adaptive software and hardware, inculcating the habit of regular exercise along with brisk walking among them.

REFERENCE:

1. Pascarelli Emil M.D., Quilter Deborah Repetitive Strain Injury: A Computer User's Guide, 1994 Wiley Publisher ISBN-10: 0471595330
2. Pascarelli Emil M.D., Dr. Pascarelli's Complete Guide to Repetitive Strain Injury: What You Need to Know About RSI and Carpal Tunnel Syndrome 2004, Wiley Publisher ISBN-10: 0471388432
3. Damany Suparna MSPT, Bellis Jack It's Not Carpal Tunnel Syndrome!: RSI Theory and Therapy for Computer Professionals, 2001, Simax Publisher, ISBN-10: 0965510999
4. Repetitive Strain Injury Available at: http://en.wikipedia.org/wiki/Repetitive_strain_injury Accessed on 27-08-2012
5. RSI by Scott Clay Available at: http://www.rsi.org.uk/ Accessed on 27-08-2012
6. RSI & BBC Health Available at: http://www.bbc.co.uk/health/physical_health/conditions/repetitivestrain1.shtml Accessed on 27-08-2012
7. Repetitive Strain Injury on Medical News Today (Available at: http://www.medicalnewstoday.com/articles/176443.php Accessed on 27-08-2012
8. Fact sheets on RSI on MFL Occupational Health Centre Available at http://www.mflohc.mb.ca/fact_sheets_folder/repetitive_strain_injury.html Accessed on 27-08-201
9. Medical Conditions- Repetitive Strain Injury on NHS-National Health Service UK Available at: http://www.nhs.uk/Conditions/Repetitive-strain-injury/Pages/Introduction.aspx Accessed on 27-08-2012
10. Angela Y. Douglas, Tracy J. Mehan, Christy L. Collins, Gary A. Smith, Lara B. McKenzie, Acute Computer-Related Injuries Treated in U.S. Emergency Departments, 1994–2006 Am J Prev Med 2009. 37(1): 24-28.
11. 10 tips for RSI Prevention Available at: http://www.rsiprevention.com/rsi_prevention.php Accessed on 27-08-2012