PREVALENCE OF NECK PAIN, PERCEIVED STRESS FACTORS AND OTHER ASSOCIATED FACTORS ON THE FUNCTIONAL DISABILITY IN SURGEONS AT HALDWANI –RUDRAPUR REGION

DEPTEE WARIKOO[1], MEENAKSHI RAWAT[2], P.S. MONDAL[3], SAURABH AGNIHOTRI[4], ANKITA SRIVASTAVA[5]

1. *Head of Department, Department of Physiotherapy, Dolphin (PG) Institute of Biomedical & Natural Sciences, Dehradun, UK, India*
2. *Research Student, MPT (Musculoskeletal disorders), Dolphin (PG) Institute of Biomedical & Natural Sciences, Dehradun, UK, India*
3. *MPT (Musculoskeletal), Haldwani*
4. *MPT (Musculoskeletal disorders), Assistant Professor, TMU, Moradabad*
5. *MPT(Cardio), Assistant Professor, TMU, Moradabad*

ABSTRACT:

The work of surgeons can involve high level of mental concentration and very precise movements that can be categorized as mild to moderate physical demands. The present study aims to investigate prevalence of chronic non-specific neck pain among surgeons in Haldwani and Rudrapur regions along this the aim is also to investigate prevalence of non-specific neck pain on the functional disability, and to analyze that how much perceived stress and other associated factors contributes on the functional disabilities in surgeons with non-specific neck pain.

Methods: A survey was conducted amongst surgeons working in various hospitals and nursing homes of Haldwani and Rudrapur regions. 60 surgeons completed the survey successfully (response rate 51.7%). Questionnaire included NPRS, Cohen PSS, NPDS and Associated factors among surgeons. The relationship among these factors with neck pain was examined.

Results: The study indicated high prevalence rate of non-specific chronic neck pain (51.7%). Neck pain was strongly associated with functional disability in surgeons (p= 0.000). Stress factors were associated with functional disabilities in surgeons (p=0.000).

Conclusion: These results indicate that non-specific chronic neck pain does affect the functional disability in surgeons. Strong association of stress factors on the functional disabilities in surgeons was confirmed, while associated factors don't contribute to the functional disabilities in surgeons. There is high recommendation of urgent ergonomic attention and physiotherapeutic awareness for the future.

Keywords: non-specific chronic neck pain; perceived stress; functional disability

INTRODUCTION

In Industrialized countries neck pain is a significant musculoskeletal disorder with high medical costs, Social costs and low rate of complete recovery. Previous studies have discovered high prevalence of neck pain among the general population[1]. Prevalence and incidence rates of neck musculoskeletal disorders have shown an increasing trend. Work related neck pain is believed to have multidimensional etiologies[2].

Surgeons are at a high risk group for developing work related musculoskeletal disorders, with prevalence rates as high as 80 % reported for neck pain among surgeons in Europe and in Hong Kong[3].

The work of surgeons can involve high levels of mental concentration and very precise movements that can be categorized as mild to moderate physical demands[4].

One of the most recognized physical stress factors in the surgeons work is the long duration of maintaining a static posture during surgery. The physical strains of performing surgical tasks with very fine manual dexterity and high precision must contribute to muscular fatigue and exhaustion in the surgeons[3].

In the field of surgical research although it a commonly recognized that maintaining a static posture is a major physical demand on surgeons, it is not clear that what parameters are appropriate to quantify this problem[3].

Surgeon's awkward body posture, increased muscle activity, repetitive movements of the upper extremities, and prolonged static head and back postures during surgical procedures are main problems, which cause work related musculoskeletal disorders.[5]

Because of the position of the patient during open surgery, surgeons tend to lean forward and this results in increased extension muscle activity to balance the body. In addition to these problems, surgeons also have to deal with problems related to in appropriate operating table height due to the different height of the surgeons in the surgical team[5].

For correspondence: Deeptee Warikoo
Email: deptee.pt@gmail.com

Furthermore, past studies have mostly attempted to examine the surgeon's physical workload in performing simulated and standardized surgical tasks[3].

A recent study in Hong Kong also found alarmingly high prevalence rates of neck and back musculoskeletal symptoms among general surgeons working in public hospitals[16].

Negative stress and prolonged pain are health risks with adverse long – term health effects[7]. Work related neck and upper limb symptoms are still prevalent. In the Netherlands, yearly sick leave due to work related neck and upper limb problems are estimated to be 2% to 4 % of all workers[8].

Neck symptoms are also common in Dutch general practice[8]. Possible risk factors are of a physical psychosocial or personal region.[8] Wauben et al. reported that over 80% of surgeons had experienced discomfort and pain in the neck after surgery[5]. Kant et al, conducted a study and reported that surgeons performed repeated static postures with forward bending of the head and twisting at the back. These positions were described as "distinctly harmful" by the subjects[5].

Moreover, individual surgeons may have differences in muscle strength and endurance differences as well as different physical fitness levels. It is not know to what extent this factor may affect their ability to handle the sustained physical workload, especially in surgeries of long duration hour and high complexity. In particular research on female surgeons is sparse and it is not known whether they may be disadvantaged in any way for those with smaller physique and weaker muscles.[3]

One study by Person et al. has attempted this approach by attaching sterilized marker arrays on to the surgeon's torso and dominant arm and used an optical tracking system to record the three dimensional co-ordinates of reflection markers with infrared cameras at 15 Hz. This was intended to study the body movements during different phases of laparoscopic cholecystectomy. However, in an actual operation the surgeons' movements can be easily blocked from the cameras and missing markers can be a major source of measurement errors.[3]

The head – neck posture is actually a combined result of movements of upper cervical spine on the head and the lower cervical spine movements.[3]

On the other hand the disadvantages for the surgeons and the operating team also are becoming increasingly known[9].

Ergonomic research strives to improve the working conditions in the operating room. The work ergonomics originates from the Greek words "ergon" means labor and "nomos" means law, which indicates knowledge concerning the law of human labor. Combined with product development and product evaluation, this leads to the working principle that the operating room designers should adapt the environment to the workers instead of adapting the workers to the environment.[9]

Surgeons in our opinion have always been an example of an individual who is determined, professional being able to control himself under adverse circumstances and willing to work extra hours beyond any schedule or program.[10]

Stress related problems have been the area of investigations for many scientists, but surgeons were one of the last to take this matter seriously.[10]

Previous study analyzed the prevalence of work related musculoskeletal disorder in Ophthalmologists practicing in Navi Mumbai and Mumbai by using a self-reported method of outcome measurement with the help of a validated questionnaire. Various methods of assessment have been described to estimate the prevalence rates such as self-report, interview and clinical examination with some differences.[11]

The present study aims to investigate the prevalence of chronic non-specific neck pain among surgeons in various hospitals and nursing homes of Haldwani and Rudrapur region and to investigate the prevalence of non-specific neck pain on the functional disability in surgeons of Haldwani and Rudrapur region, also to analyze that how much perceived stress factors and other associated factors contributes on the functional disabilities in surgeons with non-specific neck pain.

METHODS

The study examined self cross-sectional survey of non-specific neck pain among surgeons working in hospitals and nursing homes of Haldwani and Rudrapur regions. Altogether over 60 Surgeons completed surveys successfully with response rate of 51.7%. This survey study was conducted by simple interview method and e-mails to all participants. Informed consent forms were obtained from the subjects.

The Survey Design

The survey contained information on four major categories:

1. Numeric pain rating scale questionnaire (NPRS) for neck pain.
2. Cohen perceived stress scale questionnaire (PSS) 10 – items for stress factors.

3. Evaluation of functional disability by neck pain and disability scale questionnaire (NPDS).
4. Associated factors (age, gender, BMI).

Assessment of non-specific chronic neck pain done by numeric pain rating scale. It is a valid and reliable measure of chronic pain intensity. An 11 – point numeric scale with 0 representing non pain and 10 represents the extreme pain. The NPRS was administered verbally and graphically for self-completion. The respondents were asked to indicate the numeric value on the segmented scale that best describes their pain intensity as current best and worst pain and their average are taken to describe their pain.

The number that the patients indicates on the scale to rate their pain intensity was recorded scores range from 0 – 10 higher score indicate greater pain intensity. Assessment of perceived stress factors is done by Cohen's (PSS) 10 items scale. PSS will be administered in all subjects to evaluate perceived stress factors. Patient will be in comfortable seated position. Questionnaire (10 – items) scored by e-mail or by simple interview method. It is an (10 – items) measure that tests five areas of stress factors.

0 - never
1 – Almost never
2 – Sometimes
3 – Fairly often
4 – Very often

Functional disability was assessed by neck pain and disability scale which consists of 20 – items questions that measures five areas of function. Items score ranges from 0 to 5 and the total score is a total of the items scores. Completion of the NPDS usually requires less than 5 minutes. The authors suggest that a total score of 0 – 22 indicates none problems minimal problems.

23 – 40: indicates mild problems.
41-57: indicates moderate problems.
58-74: moderate - severe problems.
75-92: indicates severe problems.
93-100: indicates extreme pain, suffering and disability.

Associated factors age, gender, BMI done by simple interview method.

DATA ANALYSES

The data was analyzed for 60 subjects. Descriptive statistics was used to analyze the data. Correlation of data was done by "Karl Pearson Test". Data analysis was done using SPSS 20.0 version. Descriptive analysis was done to calculate the mean for age, BMI, NPRS score, PSS score, neck pain and disability scale for functional disabilities in subjects.

Repeated measure Karl Pearson was applied to correlate the data age, BMI, NPRS score, PSS score with NPDS score. The statistical significance was set at 95 % confidence interval with p value <0.01 considered highly significant and p value <0.05 considered to be significant.

RESULTS

Sixty surgeons which included Laparoscopic surgeons, Orthopaedic surgeons, General surgeons, Gynaecologists, Paediatrician, Dental surgeons, Cardiac surgeons, E.N.T. surgeons, Ophthalmologists, Plastic surgeons, and Neuro surgeons completed the survey successfully with all items completed with both male and female equally of age groups between 40-60 yrs. With respect to the inclusion and exclusion criteria of the study. Descriptive analysis was completed with the various variables included in the study (n=60). It shows that the age group of n=60 surgeons having the mean 51.11 with 6.81 standard deviation. For numeric pain rating score (NPRS) the mean is 5.64 with 3.61 standard deviation (n=60). For BMI (weight/height) the mean is 26.41 with 2.53 standard deviation. For perceived stress scale (PSS – 10 item score) the mean is 22.15 with 3.45 standard deviation. For the neck pain and disability scale (NPDS) score the mean is 51.20 with 28.32 standard deviation. It has shown that prevalence of chronic non-specific neck pain in surgeons was 51.7% at Haldwani and Rudrapur regions. Gender is not significantly associated with NPDS score as p> 0.958 greater than 0.05. Correlation between age and NPDS score is p >0.0057 with correlation coefficients r = 0.247 which is non-significant, so there is no association between age of the surgeons on the functional disabilities. Correlation between BMI and NPDS score is p> 0.139 with correlation coefficients r = 0.193 which is non-significant. Correlation between NPRS score and NPDS score is p< 0.000 which is significant. Correlation between PSS score and NPDS score is p<0.000 which is significant so it is interpreted that there is high positive correlation between perceived stress factors on the functional disabilities in surgeons.

DISCUSSION

Prevalence and incidence rates of neck musculoskeletal disorders have shown an increasing trend[2]. Work related neck pain is believed to have multidimensional etiologies[2]. Surgeons' awkward postures increased muscles activity, repetitive movements of the upper extremities, and prolonged static head and back postures during surgical procedures are main problems, which cause work related musculoskeletal disorders[5]. Wauben et al. reported

that over 80% of surgeons had experienced discomfort and pain in neck after surgeries[5]. Previous study analyzed the prevalence of work related musculoskeletal problems in ophthalmologists practicing in Navi Mumbai and Mumbai by using a self-reported method of outcome measurement with the help of validated questionnaire[11]. In this study results showed that chronic non-specific neck pain is prevalent among the surgeons of Haldwani and Rudrapur regions.

In this study the prevalence was 51% in chronic non-specific neck pain among surgeons. In 2015 by Dabohlker T[11] in Navi Mumbai and Mumbai the prevalence rate of neck pain was 51% in the Ophthalmologists during surgery hours and 27% of them complain during O.P.D hours, as compared to back pain which was 46% during surgical hours and 51% during O.P.D hours while shoulder pain was 16% and 14% headache during and after O.P.D. hours. It was observed from this study that there is a strong positive correlation between the prevalence of non-specific neck pain on the functional disability in surgeons with ($p<0.000$). There is also high positive correlation between the perceived stress factors on the functional disability in surgeons with ($p<0.000$) value. While the associated factors such as age, shows correlation with functional disability in surgeons statistically non-significant result ($p>0.057$) value. Correlation of gender with functional disability in surgeons showed non-significant result ($p> 0.958$) as the p values greater than 0.05. Correlation of BMI (Height, Weight) with functional disability in surgeons showed on-significant result ($p> 0.735$) as the p values greater than 0.05.

Neck pain has been found to be a major health problem for surgeons. This study reveals that chronic non-specific neck pain is prevalent highest among surgeons and showed positive relationship on the functional disabilities in surgeons. Other factors like perceived stress factors and other associated factors were included in this study. The study showed that there is major contribution of perceived stress factors on the functional disability in surgeons, but the other associated factors on functional disability in surgeons revealed non-significant results. So there is no contribution of the associated factors on the functional disability in surgeons.

The purpose of this study was to find the prevalence of non-specific neck pain in surgeons which was clearly seen in surgeons so that to suggest the better ergonomic attention and physiotherapeutic awareness in them.

LIMITATIONS OF STUDY

The sample size of the present study was small. In addition there was time limitation while collecting the data from the surgeons due to the busy schedule of the surgeons. In future gender based study can be done. In addition ergonomics related study can be done for the surgeons, and also the same study can be done for the back pain and various musculoskeletal symptoms in the surgeons for the future research.

CONCLUSION

In conclusion, the present survey study has shown high prevalence rates of chronic non-specific neck pain in surgeons of Haldwani and Rudrapur region. The results indicated that prevalence of non-specific neck pain in surgeons also contributes, and affects the functional disabilities in them. While stress factors perceived by them which could be psychological, physical, social also affects the functional disabilities in surgeons. But associated factors do not contribute positive results on functional disabilities in them. So it is clear that there is high prevalence of non-specific chronic neck pain in surgeons at Haldwani and Rudrapur cities. In addition prevalence of non-specific neck pain hampers their functional disabilities in their lifestyle stress factors also hampers their lifestyle (functional disability) severely. We recommend urgent ergonomic attention and postural awareness to the work set up and better ergonomic practices in surgeons for the future as well as to provide some physiotherapeutic awareness for the treatment of surgeons with non-specific neck pain.

ACKNOWLEDGEMENTS

It has been a privilege and a great experience working on this topic with great support from Dolphin (PG) Institute of Biomedical & Natural Sciences, Dehradun. I thank all my associates for constant help, support, encouragement & guiding my work in every step.

REFERENCES

1. Xiaopeng Ning, Yuping Huang, Boyi Hu, Ashish D. Nimbarte. Neck Kinematics and muscle activity during mobile device operations. International journal of industrial ergonomics 48 (2015) 10-15.
2. Ashish D. Nimbarte, Suman Kanti Chowdhary, E David Cart Wright. Empirical evaluation of neck muscle fatigue generated

by health care exertions. Safety science 57 (2013) 100-107.
3. Grece P.Y, Szeto, Ph.d, Stephan W.K Chang, M.D, Jensen T.C. Poon. M.D. Albert C.W. Ting M.D. Raymond C.C. Tsang M.Sc. and Pei Ho. M.D. Surgeons statics postures and movements repetitions in open and laparoscopic surgery. Journal of surgical research 172, E 19-E31 (2012).
4. Grace P.Y Szeto, Pie Ho. Albert C.W. Ting M.D Jensen T.C. Poon. Stephen W.K. Chang Raymond C.C. Tsang . Joceup. Rehabilitation (2009) 19 ; 175-184.
5. Nihan Karatas, Seda BICICI. The effect of Kinesiotape application on functional performance in surgeons who have musculoskeletal pain after performing surgery. 2011, 10.5137/1019-5149.
6. Szeto GPY HOP, Ting ACW J.T.C. Poon RCCT Sang. SW.K.Cheng. A study of surgeons postural muscle activity during open, laparoscopic and endovascular surgery. Surg.Endosc(2010)24;1712-1721.
7. Berit Osteras, Herundur sigmundrsson and Monika Hapa. Perceived stress and musculoskeletal pain are prevalent and significantly associated in adolescence. An epidemiological cross-sectional study. BMC public health (2015) 15;1081.
8. P.M. Bonrgers S, Ijmker. S.Vanden Hevvel. B.M. Blatter. Epidemiological of work related neck and upper limb problems. Psychosocial and personal risk factors(part-I) and effective interventions from a behavioural perspective (part-II) J.occup. rehabi.(2006)16;279-302.
9. L.S.G. L Wauben, MA Van Veelan D.Gossot, R.H.M. Goosens. Application of ergonomic guidelines during minimally invasive surgery. A questionnaire survey of 284 surgeons. (2002). Surgery endosco.16;635-639.
10. Ioannis, Christakis, Morios T Pagkratis, Lisa, Varrogli, Christina Darviri, Geoge Chnussos. Measuring the stress of surgeons in training and use of a novel interventional programme to combat it. J. Korean Surg.Soc.2012,82;312-316.
11. Dabholker T, Yardi, Dabholker YG, Nrayan prevalence of work related musculoskeletal problems in ophthalmologist practicing in Navi Mumbai and Mumbai . International Journal of medical research professionals. (2015)3;80-84