

Prevalence and Risk Factors of work Related Musculo Skeletal Disorders (wrmsd's) Among Doctors - A Cross Sectional Study

Biju Azariah ^{1*} and Geethu Babu ²

¹Department of Radiation Oncology, VMMC & Safdarjung hospital, New Delhi

²Department of Radiation Oncology, Regional Cancer Centre, Trivandrum

ABSTRACT

Work related musculoskeletal disorders (WRMSDs) have not only shown to impact the physical and psychological comfort of the employee but also deteriorate the prospects of any production or service sector. The prevalence of WRMSDs, though studied extensively in various sectors, has been understudied in health sector, especially among doctors. This study which evaluated the prevalence and risk factors of these disorders among fifty cancer treating Radiation Oncologist at a Tertiary Care Cancer Centre in India had exposed out an alarming 68% prevalence of these disorders in the study population, with neck pain being the commonest site of these Musculoskeletal Disorders (MSDs). Several factors which could impact the development of MSDs were analysed. This higher incidence of MSDs is presumed to be because of extreme physical and mental stress of working in a high volume cancer care centre, persistent unhealthy postures during work, inadequate micropauses between works and uncomfortable working atmosphere. Adequate physician patient ratio, restricting the patient load, providing good physician friendly working environment and adequate mandatory breaks might significantly reduce the incidence of these disorders and can prevent the sagging of health care delivery.

*Corresponding author

Biju Azariah, Department of Radiation Oncology, VMMC & Safdarjung hospital, New Delhi, India. E-mail: bijuazariah7686@gmail.com

Received: June 23, 2021; **Accepted:** June 28, 2021; **Published:** June 30, 2021

Keywords: Musculoskeletal disorders, Radiation oncologist

Introduction

Work-related musculoskeletal disorders (WMSDs) are defined as “regional impairments of the muscles, tendons, nerves and joints that are associated with work-related mechanical trauma” [1]. The incidence and prevalence of these WMSDs among computer professionals and other hardware workers is a well studied entity. However, WMSDs do exist in significant percentage of medical professionals and this is usually overlooked. Doctors are exposed to a wide range of work related risk factors that may result in various occupational diseases, of which musculoskeletal disorders (MSDs) are common. This occurs in spite of doctors holding sufficient knowledge in the prevention of these disorders. Medical practice involves repetitive tasks, high force manual techniques, and awkward joint position during certain manoeuvres and prolonged constrained postures. These may induce pain or discomfort, loss of motor or sensory function, depression or anxiety, impairment of tissue reorganization (pathological or adaptive) and facilitating inflammations, depending on duration of exposure [2]. The common WMSDs among medical professionals are pain in low back, neck, shoulder, hand, wrist, elbow, and upper back [3-6]. Fortunately, good ergonomic practices can drastically reduce the likelihood of severity of MSD. An overview of the incidence and the prevalence of musculoskeletal complaints among health care providers may assist in adequate prevention of work-related diseases and consequently provide a safer and healthier environment for them. This might in turn increase their efficiency in delivering quality health care for the patients.

Hence, this study was conducted among physicians [Radiation Oncologist] in a tertiary care cancer centre, to determine the prevalence of WMSDs among them and to study the possible aetiology for the same and assess its effect on their job efficiency.

Aim of the Study

1. To study the prevalence of work related musculoskeletal disorders among doctors [Radiation Oncologists]
2. To study the risk factors for the development of these WRMSDs.
3. To suggest possible remedial measures for the prevention of these WRMSDs.

Study Methodology

This study was conducted as a cross sectional study among 50 doctors working as full time Radiation Oncologist at the Radiation Oncology Department in Regional Cancer Centre Trivandrum. This group was selected as the study population because of the observed higher incidence of musculoskeletal disorders among them. The health care professionals who are purely academicians, those with current musculoskeletal trauma and those who refused to participate were excluded from the study. Radiation oncologist working in RCC has a standard working time of 9:00am to 4:30 pm with one hour of non standardized lunch break at noon. But due to the extreme patient load handled by the institute (~16000 new patients every year and more than 2 lakh appointments each year), the oncologist are forced to work much beyond their physical and mental ability. Most of the oncologist start their routine work by 8 am and end it by 5 pm.

The routine work for every oncologist begins with ward rounds every day which might extend up to an hour. This is followed by out-patient [OP] clinic which requires prolonged sitting till 4:30 pm. Oncologist hardly get meal breaks at noon time. On the alternate days of OP clinic, oncologist will have to involve themselves in the radiation planning procedures that might involve sitting / short distance brisk walking/ standing. This may extend to 5-6 hours. The weekly routine consists of outpatient clinic for three days and radiation planning for 3 days. Oncologist has six days of working in a week followed by weekly off on Sundays. There are hardly any night duties for consultants.

All the clinicians included in the study were given a structured questionnaire which was created based on the Nordic musculoskeletal questionnaire (kuorinka et al 1987) a standardized screening and surveillance tool to find out the body regions affected by musculoskeletal symptoms [Appendix- 1]. The questionnaire was modified and customized to suit the present study population. The questionnaire evaluated the following details from the subjects - Details of demography, Medical and occupational history, Diet pattern, Lifestyle, Personal habits, Co morbidities, Physical stature, Mode of commutation, Questions to determine if the symptoms were work related, Workstation and nature of various tasks, Duration of work and rest, Nature, duration and severity of musculoskeletal disorders and Impact of MSDs on their daily routine. All the responses were documented into excel sheets and were assessed using SPSS software v12. The study was initiated after the approval from the institutional review board.

End Points

1. Prevalence rate of WRMSDs.
2. Sub site incidence of WRMSDs.
3. Risk factors for WRMSDs.
4. Impact on the work efficiency

Statistical Analysis

The data were analysed using the statistical package for the social sciences (SPSS) software (version 12.0). The results have been reported as descriptive statistics. The association between dependent and independent variables was analyzed. Univariate and multivariate analyses were performed to identify risk factors. Differences between groups were calculated through cross-tabulations or an independent sample's t-test. The odds ratio (OR) was calculated and a 95% confidence interval was applied.

Results

All the clinicians who were given the questionnaire responded, therefore the response rate was 100 %. All participants were full time Radiation Oncologist. Of the total subjects, 34 (68 %) had some form of musculoskeletal disorders and 16 (32%) % had none of the musculoskeletal disorders. 23 (46%) had disorder in the neck , 6 (12 %) in the shoulders, 1 (2 %) in the elbows, 2 (4%) in the wrist/ hand, 4(8 %) in the upper back ,17 (34 %) in the lower back , 5(10 %) in the hips, 4 (8%) in the knees and 4 (8%) in the ankles/feet only . Of the subjects who had musculoskeletal disorders, 18(36 %) had trouble in the last 7 days.

Low Backache

17(34 %) of the subjects had MSD s involving lower back. 3(6 %) had been hospitalized for the same . 6(12%) had to change their duties because of LDA. 9(18 %) of population had low back ache for 1-7 days, 6(12%) for 8-30 days, 5 (10%) for > 30 days . For 13 (26 %) of the subjects, they have to reduce their work activity and for 10 (20%) has to reduce their leisure activity. 7 % had disorders severe to be consulted by doctor/ physiotherapist / chiropractor.

Neck Pain

23 (46%) of the subjects had MSD s involving neck pain . 3 (6 %) had been hospitalized for the same. 5 (10%) had to change their duties because of LDA. 10(20%) of population had low back ache for 1-7 days, 6 (12%) for 8-30 days, 3 (6 %) > 30 days , for 10(20%) of the subjects, they have to reduce their work activity and for 7(14%) has to reduce their leisure activity. 8(16 %) had disorders severe to be consulted by doctor/ physiotherapist / chiropractor.

Discussion

WRMSD S has been proven to be a major outcome limiting factor in production sectors. The impact caused by these MSD S has been elaborately studied among both hardware and software sector. The causative agents for these disorders have also been identified and various preventive and therapeutic measures have been suggested by investigators.

Tertiary care institute was selected as the study area because of the extreme patient load handled by these centre and the reasonable dedication of the doctors serving in a tertiary care centre. The study population selected was Radiation Oncologist who are physicians taking care of cancer patients by treating them with chemotherapy and radiotherapy. This group was selected as the target population because they undergo extreme stress physically and mentally while taking care of end stage cancer patients particularly. Further Regional Cancer Centre, Trivandrum, where this study was conducted is a renowned cancer care centre in India which handles about 1200 patients every day.

Doctors included in the study have to report by 8:30 am in the morning for the regular ward rounds which may extend between 30 minutes to 2 hours depending on the number of in-patients. Doctors have to walk quiet long to attend every patient admitted in the hospital spread around several wards. Following these physicians has to either take care of out –patients [OP] or report for Radiation Therapy planning. Usually doctors have three days of OP in a week and three days of radiation planning alternatively. Doctors are exempted from regular duty on Sundays. In the OPs, doctors has to take care of about 100-120 patients every day. OP might continue till 4:30pm with about half an hour of non standardized lunch break in between. Lunch timing might vary depending on the remaining patients waiting to see to the doctor. It is mandatory that doctors finish the OP before they can leave home. OP is majority a sitting job with doctors getting up only while examining patients. Persistent sitting and continuous writing added by the extreme mental stress in dealing with the physical, emotional and financial status of the patient and their family, puts an unimaginable overall stress to the physician.

For physicians who have to plan Radiation Therapy, it is predominantly sitting job and sometimes walking. Since most of the planning is done through computers, physicians have to sit in the computer desk continuously for hours with good concentration to plan radiation therapy. Hence overall the study group is completely engaged during their time in the hospital. Work gets over between 4:30 to 5 and the physician does not have to take any night duties except for the residents who have to perform a 24 hour duty for couple of days in a month. With this back ground about the work nature of the target population, we will discuss the incidence and possible risk factors of WRMSD S among this group.

The total number of subjects included in the study was 50. With respect to age, the subjects were stratified into three groups' ≤ 30 ,

31-49 years and 50 years. About 89.4% of subjects in the 31- 49 years had MSDs. The difference in the MSD s among these three groups were statistically significant [$p=0.018$]. The most frequent MSD among this group was neck pain. This is probably the group which constitutes the junior consultants, who are the major work force of the department. Extreme persistence of posture maintained during OP consultations and during radiation planning, major responsibilities to get the work done within the day might be the factors contribution to the development of MSDs in this age group. Unhealthy neck postures and neck muscle spasm due to mental stress could be the contributing factor for the neck pain.

With respect to sex, the MSDs were evenly distributed among males and females and the difference was statistically insignificant ($p=1$). There was no statistically significant difference in the neck pain of low back pain among the two groups. This is mainly because both the groups are exposed to similar level of physical and mental stress and this also shows that it is the hospital related factors which attribute to these disorders and the stress/ physical work at home might not confound the incidence of WRMSD S. The incidence of MSD s were not statistically different between married and unmarried because of the extremely low number of unmarried subjects (8 out of 50). However what is to be considered is 6 out of 8 unmarried subjects reported WRMSD S showing that marriage and family factors might not contribute significantly to the incidence of WRMSD s. and further this group of subjects are younger and junior physicians on whom higher manual work needs rests in the hospital.

Though the incidence of MSD s were larger in the individuals taller than 160 cm, the difference (of either neck pain or low back pain) was not statistically significant. The incidence of WRMSD s did not differ significantly among groups of different weights [≤ 60 , 61-70 and ≥ 71]. How eve the incidence of these disorders were higher in the 61-70 year group. Though low back pain has been shown to be higher in taller and heavier subjects, small target number failed to provoke a statistical difference in our study. The presence of co morbidities (Diabetes mellitus, hypertension, and hypothyroidism) significantly increased the incidence of MSD S. All 10 subjects (100%) with co morbidities had musculoskeletal disorders. ($p=0.021$). Most of the subjects had their MSD s developed after the diagnosis of co morbidities. The presence of co morbidities might have caused them a reduction in active physical activity / exercise which might have led to increased incidence of MSD s.

Mode of commutation to hospital did not impact the incidence of musculoskeletal disorders in any way. Significant number of subjects used car (72%) for their regular transport and the incidence of MSDs in them was 66.2%. About 17 subjects (34%) exercise regularly and the incidence of MSD s among them was 76.4%. There was no statistically significant difference in the incidence of MSDs among those who exercise regularly and who don't. And most of the subjects do regular exercise to reduce the symptoms of their MSDs. Presence of domestic maids in the home either impacted the incidence of MSDs. Almost half of the subjects had maids in their home to help their house hold activities. This reaffirms the fact it the work related stress which is the major factor for the development of WRMSDs. Although the duration of present work (10 years/ > 10 years) did not impact the incidence of MSDs statistically, the incidence of neck pain was higher (55%) in subjects who had been doing the present work for > 10 years. This can be attributed to the duration associated degenerative changes in bone and connective tissues resulting in increased MSDs as the duration of job increases. Though the incidence of MSD s were higher in subjects whose predominant posture was

sitting (over subjects whose predominant posture was walking+ standing / both), the difference was not statistically significant.

The incidence of MSDS were higher in those who use lift + swivel chair (77 % vs 64%), it was not statistically significant. May be it is because of the presence of WRMSDs subjects preferred to use lift + swivel chair. To be noted here is lift +swivel chair is not provided to ever doctor in the institute.

The incidence of MSD s among subjects whose orientation with patients were oblique, right angle and straight were 68.7%, 78.5%, 33.3% respectively, with higher incidence among right angle orientation. This might be because of the extreme stress experienced by hip during right angle and oblique orientation. However this difference was statistically not significant. There was no statistically significant difference in the incidence of MSD s among subject who felt their job to be monotonous, semi monotonous or versatile. Of the total subjects, 34 (68 %) had some form of musculoskeletal disorders. The commonest site of MSD was neck 23 (46%) followed by 17 (34 %) in the lower back. The incidence of neck pain was more than that of the low back pain (50% Vs 38%) among the entire study population. Of the subjects who had musculoskeletal disorders, 18(36 %) had trouble in the last 7 days.

13 (26 %)of the subjects have to reduce their work activity and 10 (20%) has to reduce their leisure activity because of low back ache, and 7 % had disorders severe to be consulted by doctor/ physiotherapist / chiropractor. 10(20%) of the subjects have to reduce their work activity and 7(14%) has to reduce their leisure activity due to the neck pain and 8(16 %)had disorders severe to be consulted by doctor/ physiotherapist / chiropractor .

Hence, the above analysis shows that the incidence of WRMSDs is alarmingly high in the study population and it has caused significant subjects to modify their work and leisure activity. Also it had caused sick absenteeism in significant number of physicians. The detrimental effect of the WRMSDs was well perceived in the Radiation Oncology department. These disorders prevented consultants in pursuing their routine busy schedule which resulted in OP s getting delayed to get over, patients waiting long to get consulted, radiation planning and treatment being delayed for the patients and more over it had put an enormous extra stress on the other physicians who has to execute the job of the morbid professional. Several factors could be attributed to the higher incidence of these disorders among radiation oncologists. Major factor being the monotonous nature of work. The radiation oncology department is divided into four major clinics[B, C , D and E] according to the sites of malignancies dealt with. Regular (permanent) employees are made fixed to one particular clinic during their entire period of service. This makes their job relatively monotonous. The postures they follow, work nature, duration of breaks and the intensity of work all becomes monotonous. This might be one major factor which can predispose to the development of MSDs.

The next factor being the relatively low doctor patient ratio. Though the number of faculties has gradually increased over the past decade, still the number of oncologists remains low. In spite of residents helping the consultants, every patient has to be attended by the consultants. This puts a rough ratio of 1 consultant to 100 patients every day. Consultants should do this thrice a week. This is in high contrast with what the physicians in developed nations has to encounter (1 doctor to 10 patients everyday). This can understandably put the consultants under extreme physical and

mental stress resulting in the development of MSDs. The next factor is the extreme mental stress of working in cancer hospital. Cancer is a disease with lower cure rates. Most of the treatments given for cancer is highly toxic and also imparts a heavy financial burden for the patient and family. So the physicians should handle several factors while dealing with the patient. The decision they take should be ethical, beneficial and comfortable for the patients. Most often individualized decision making is required for treating the patients. This persistent mental stress can cause severe neck muscle spasm resulting in the development of neck pain. Another factor which can increase the perceiveness of these disorders is the harmony with the pals and the management. Subjects who are in disharmony with the environment they work have more tendencies to develop MSDs or to false report symptoms as a part of escape mechanism or attention seeking action.

Remedial measures

The following might be suggested as the remedial measures to reduce the prevalence of WRMSDs.

1. Physicians can be given the freedom of opting their desired clinic not only based on their professional interest but also the physical and mental comfort. This can create a physiological harmony for the consultants who will be executing a relatively monotonous job for the rest of their service at the institute.
2. Physicians can be advised mandatory rotation of clinics to expose them to both hectic and non hectic clinics. This could prevent them from working in busy clinics for their life and subsequently developing MSDs.
3. Changes in the work nature can be helpful. Instead of spending one full day in OP management or radiation planning, work can be mixed up to prevent physicians from adhering to a persistent posture for one full day.
4. Adequate micro pauses [~ 10 minutes] for relaxation and stretching exercises every two hours can bring a drastic change in the physical wellbeing.
5. Limiting the patient load, by registering only patients who require sophisticated treatment from a tertiary care centre can in a big way improve the wellbeing of doctors and also improve the quality of health care delivered.
6. Adequate weekly offs; at least two days in a week might go a long way in rejuvenating the health of the professionals.
7. Providing good working environment like, spacious OP rooms, comfortable chairs, adequately heighted tables, properly placed computer monitors and key boards, good temperature, light and humidity control, adequate refreshments might bring a harmony with the working environment there by reducing the incidence of MSDs.
8. Above all, it is important for the employer to maintain pleasing relationships with the employee to preserve the mental wellbeing of the employee.

Conclusion

The incidence of WRMSDs among the physicians is significant and it has been understudies so far. This study brings into light the alarming prevalence of these disorders among Radiation Oncologist working in a tertiary care centre. Though several factors were associated with these disorders, presence of co morbidities and age of the subjects impacted the incidence of these disorders significantly. The sample size was small that statistical difference could not be produced among other risk factors. MSD s had lead to sick absenteeism leave in `16 individuals which could have impacted the health care delivery significantly. Adequate physician patient ratio, comfortable working environment, mandatory micro pauses and harmony with the institution might reduce the incidence

of these disorders significantly and improve the quality of service provided by the institution.

References

1. Bhattacharaya A, McGlothlin JD (1996) Occupational Ergonomics Theory and Applications. 2nded. New York: Marcel Dekker, 581.
2. Barbe MF, Barr AE (2006) Inflammation and the pathophysiology of work-related musculoskeletal disorders. Brain BehavImmun 20: 423-429.
3. Mirbod SM, Yoshida H, Miyamoto K, Miyashita K, Inaba R, et al. (1995) Subjective complaints in orthopedists and general surgeons. Int Arch Occup Environ Health. 67: 179-186.
4. Nordin NA, Leonard JH, Thye NC (2011) Work-related injuries among physiotherapists in public hospitals: A Southeast Asian picture. Clinics (Sao Paulo) 66: 373-378.
5. Salik Y, Ozcan A (2004) Work-related musculoskeletal disorders: A survey of physical therapists in Izmir-Turkey. BMC MusculoskeletDisord 5: 27.
6. Holder NL, Clark HA, DiBlasio JM, Hughes CL, Scherpf JW, et al. (1999) Cause, prevalence, and response to occupational musculoskeletal injuries reported by physical therapists and physical therapist assistants. PhysTher 79: 642-652.

Copyright: ©2021 Biju Azariah. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.