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Dr. Naveen BS
Assistant professor
Dept of Radiology
Akash Institute of Medical
Science and Research Centre,
Prasanna road, Devanahalli
Bangalore Rural, Karnataka,
India

Evaluation of non-radiation occupational hazards faced by radiologists

Dr. Naveen BS

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Abstract

Background: Radiologist perform tedious task of reporting in this fast growing health sector. The present study was conducted to determine non-radiation occupational hazards faced by radiologists.

Materials & Methods: The present study was conducted on 114 radiologists who agreed to participate in the study. Information regarding film-based versus workstation reporting, working hours, musculoskeletal injuries, depression, the causes of stress etc. was recorded to assess various mental health issues.

Results: Forty radiologists had >10 years of experience, 50 had 5-10 years and 24 had 1-5 years, 50 were working n USG only, 34 predominantly workstation-based and 30 predominantly film-based, 50 used to work >70 hours per week, 39 between 40-70 hours and 25 less than 25 hours per week. Various non- radiation occupational hazards were neck pain in 78, shoulder pain in 65, wrist pain in 96, elbow pain in 53, tenosynovitis in 68, carpal tunnel syndrome in 34, chronic eye strain in 70, needle prick injury in 25, varicose veins in 35, depression in 60 and burnout in 52 radiologists. The difference was significant ($P < 0.05$).

Conclusion: Authors found that various non- radiation occupational hazards such as neck pain, shoulder pain, wrist pain, tenosynovitis, carpal tunnel syndrome, chronic eye strain, varicose veins and depression.

Keywords: Radiologists, tenosynovitis, wrist pain

Introduction

Radiation is being used not only in diagnostic purposes but also in cases of therapeutic interventions. Occupational health hazards are not uncommon and radiation occupational hazards are one of them inspite of numerous national and international guidelines. However, in the category of occupational health hazards, these non-radiation hazards have almost certainly not yet acknowledged the attention they deserve.

Radiologist perform tedious task of reporting in this fast growing health sector. Radiologists as a group encounter exceptional occupational health hazards. Recent studies have been published regarding ergonomics and musculoskeletal problems in radiology as well as mental health issues faced by radiologists. Radiology has a singular work environment not seen in other medical specialties. It demands long working long hours on a computer. Interventional radiologists working in angiography suites are also exposed to unique musculoskeletal problems. Ultrasound (USG) is routinely performed diagnostic process in daily basis. The low cost and high sensitivity and specificity has made this option as preferred among medical professionals. Many radiologists spend plentiful time performing ultrasound requiring constant use of a single upper limb resulting in Transducer user syndrome.

Occupational hazards can unfavorably impact the physical and mental health of the radiologist. These hazards have reduced productivity, increase medical errors, and lead to early burnout. Considering this, the present study was conducted to determine non-radiation occupational hazards faced by radiologists.

Materials & Methods

The present study was conducted in the department of Radio- diagnosis. It comprised of 114 radiologists who agreed to participate in the study. The study protocol was approved from institutional ethical committee.

Corresponding Author:
Dr. Naveen BS
Assistant professor
Dept of Radiology
Akash Institute of Medical
Science and Research Centre,
Prasanna road, Devanahalli
Bangalore Rural, Karnataka,
India

Data such as name, age, gender etc. was recorded. A questionnaire was prepared and distributed among radiologists to respond. Information regarding film-based versus workstation reporting, working hours, musculoskeletal injuries, depression, the causes of stress etc. was recorded to assess various mental health issues. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1: Distribution of patients

Total- 114		
Gender	Male	Female
Number	60	54

Table 1 shows that out of 114 radiologists, males were 114 and females were 54.

Table 2: Assessment of parameters

Variables	Number	P value
Experience		
1-5 years	24	0.01
5-10 years	50	
>10 years	40	
Working patterns		
Predominantly workstation-based	34	0.05
Predominantly film-based	30	
USG only	50	
Number of working hours per week		
<40	25	0.04
40-70	39	
>70	50	

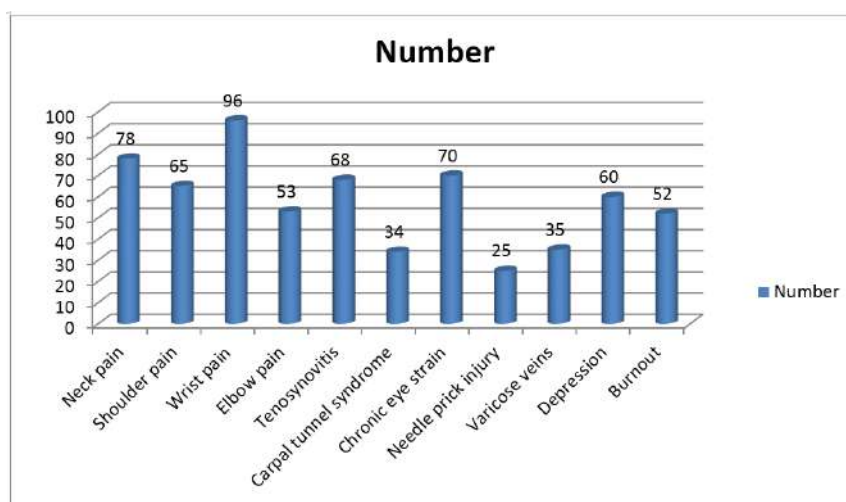
Table 2 shows that 40 radiologists had >10 years of experience, 50 had 5-10 years and 24 had 1-5 years, 50 were working n USG only, 34 predominantly workstation-based and 30 predominantly film-based, 50 used to work >70 hours per week, 39 between 40-70 hours and 25 less than 25 hours per week. The difference was significant ($P < 0.05$).

Table 3: Various non- radiation occupational hazards

Variables	Number	P value
Neck pain	78	0.01
Shoulder pain	65	
Wrist pain	96	
Elbow pain	53	
Tenosynovitis	68	
Carpal tunnel syndrome	34	
Chronic eye strain	70	
Needle prick injury	25	
Varicose veins	35	
Depression	60	
Burnout	52	

Table 3, graph 1 shows that various non- radiation occupational hazards were neck pain in 78, shoulder pain in 65, wrist pain in 96, elbow pain in 53, tenosynovitis in 68, carpal tunnel syndrome in 34, chronic eye strain in 70,

needle prick injury in 25, varicose veins in 35, depression in 60 and burnout in 52 radiologists. The difference was significant ($P < 0.05$).



Graph 1: Various non- radiation occupational hazards

Discussion

Radiologists are doing great job by providing useful hidden information. USG, CT, MRI etc. are routinely performed procedure. It has been recommended and utilized by every branch of medicine [6]. The cumulative lifetime occupational

radiation dose experienced by radiologists and the potential resulting adverse effects have been a concern to the profession for decades [7]. Radiation risks were poorly understood in the early days of medical imaging, and radiology was involved with the first case of a cancer (skin)

induced by radiation. Soon after, the association of radiation with leukemia was described [8]. Historically, a higher percentage of radiologists were exposed to substantial lifetime occupational doses, because before the advent of cross-sectional imaging in 1980, many diagnostic imaging studies involved radiologists performing hands-on roles. Currently, radiologists in clinical practice, particularly those who routinely perform image-guided procedures, may be exposed occupationally to low-dose radiation above background levels [9].

Fidler *et al.* [10] recognized this issue and sought to assess the effectiveness and utility of a walking workstation during CT scan reporting. Lamar *et al.* quantified the sedentary work life of the radiologist by surveying the levels of at-work and out-of-work sitting among radiology, paediatric and general medicine residents in 2016 and unsurprisingly found that the radiology residents led a more sedentary occupational lifestyle. However, radiology residents had showed better activity during the interventional radiology postings. The present study was conducted to determine non-radiation occupational hazards faced by radiologists.

In present study, out of 114 radiologists, males were 114 and females were 54. We found that 40 radiologists had >10 years of experience, 50 had 5-10 years and 24 had 1-5 years, 50 were working on USG only, 34 predominantly workstation based and 30 predominantly film based, 50 used to work >70 hours per week, 39 between 40-70 hours and 25 less than 25 hours per week.

Kawthalkar *et al.* [11] conducted a study in all 383 radiologists. A high prevalence of repetitive stress injuries, chronic eye strain, depression, and burnout was found. Significant correlation was found between repetitive stress injuries and burnout. Pre-Conception and Pre-Natal Diagnostic Techniques Act (PCPNDT) related issues and work overload were the most common causes of high stress levels. Radiologists whose practices followed ergonomic design showed significantly less prevalence of neck pain.

We found that various non-radiation occupational hazards were neck pain in 78, shoulder pain in 65, wrist pain in 96, elbow pain in 53, tenosynovitis in 68, carpal tunnel syndrome in 34, chronic eye strain in 70, needle prick injury in 25, varicose veins in 35, depression in 60 and burnout in 52 radiologists. As per World Health Organization estimates, the lifetime prevalence of mental illnesses in the general population is an astonishingly high number of 18%–36%. Approximately 13%–20% of physicians are known to suffer from depression. Burnout is increasingly being recognized as a serious mental health condition. It has been defined as a triad of emotional exhaustion, depersonalization, and reduced personal accomplishment. Residency in particular is known to be a period of one's career where one is prone to develop a psychiatric illness. As per previous studies, one-third of residents suffer from depression and up to 75% residents experience burnout [12].

Conclusion

Authors found that radiologists who had >10 years of experience and who used to work >70 hours per week were suffering from various non-radiation occupational hazards such as neck pain, shoulder pain, wrist pain, tenosynovitis, carpal tunnel syndrome, chronic eye strain, varicose veins and depression.

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