The radiologist's index finger

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Purpose

Modern day radiology departments are fully digitised and use PACS (Picture archiving and communication system) as single point of access for images. As a result radiologists spend long periods of time at a computer work station. Although implementation of PACS has resulted in improved radiologist's productivity and reduced turn over time\(^1,2\); there is an increased risk of musculoskeletal injuries secondary to repetitive stress\(^3,4\).

A computer mouse is a vital part of a computer work station and is used one to two-thirds of the time during computer work\(^5\). The most commonly used finger for mouse related functions (click, click+drag and scroll) is index finger of the dominant hand.

Intensive mouse use can result in musculoskeletal symptoms in forearm, wrist and hand pain\(^6\). This has been attributed to sustained static lifting behaviour of the finger to prevent accidental activation of the buttons\(^7\) and also to the repetitive movements while performing various mouse related functions.

A study by Sillanpaa et al in 1997 showed 16% prevalence of musculoskeletal symptoms in the finger secondary to computer mouse use. The symptoms were not related to the duration of mouse use, but to the way the mouse was handled\(^8\).

Although there has been extensive research to improve the work place safety for people working with computers, little attention was given to a radiologist's work station following implementation of PACS.

The aims of this study are:

1. To demonstrate a relation between the mouse use and finger symptoms in radiologists.
2. To investigate the possible association between the onset of finger symptoms and other PACS work station related symptoms.
3. To provide simple measures for symptomatic relief.
Methods and Materials

A questionnaire was distributed to 40 radiologists working at two major teaching hospitals in Perth. It consisted of 14 questions; concerning demographics, experience with PACS in radiology, mouse handling, symptoms in finger used for mouse related functions and its relation to mouse use, management of symptoms, improvement of symptoms following management and other symptoms related to PACS use.

The results were entered on a spread sheet and subjected to statistical analysis.
Results

The questionnaire was distributed to 22 consultants and 18 registrars. Majority of them were right handed (38 out of 40) and commonly used finger for left mouse button was index finger (39 out of 40) and for scrolling was index finger (35 out of 40).

8 radiologists had symptoms in the finger used for mouse related functions (95% confidence interval 9%-35%).

2 were registrars with 3 and 4 years of experience with PACS. The remaining 6 were consultants with 5 to 12 years of experience with PACS.

All 8 radiologists were right handed and used index finger for performing left mouse button function and to scroll.

The severity of symptoms varied between these radiologists. On a scale of 1 to 10 (1 being lowest and 10 being highest) the median was found to be 3.

None of these radiologists sought medical attention, instead they tried few simple measures for symptomatic relief:

a) Used key board short cuts.

b) Used dominant middle finger for using left mouse button.

c) Alternated between dominant and non-dominant index finger.

d) Changed settings in the computer and switched functions between left and right mouse button, to use middle finger for mouse related function.

Improvement of symptoms was seen in 5 radiologists (95% confidence interval 24%-91%).

The other common symptoms noted were: eye strain (mean 0.32, 95% confidence interval 18%-49%), neck and back pain (mean 0.37, 95% confidence interval 22%-54%). But we found a weak association between onset of finger symptoms and other PACS related symptoms (p=1.0)

It is important to note that majority of these radiologists (27 out of 40) thought extensive mouse use could result in arthritis of finger joints.
Conclusion

This study has shown a possible link between extensive mouse use and onset of mouse finger symptoms in radiologists and development of these symptoms is related to prolonged mouse use. We have not demonstrated a strong association between the onset of finger symptoms with other PACS work station related symptoms, e.g: eye strain, neck pain and back pain. However, this study is limited by its sample size and further research with a larger sample is essential.

Simple measures to reduce the mouse finger symptoms include:

- Keyboard shortcuts.
- Alternating between dominant and non-dominant hand.
- Alternating between index and middle finger to perform mouse related functions.
- Changing mouse settings and switching functions between left and right mouse button.

Lee et al designed a study to look at the effect of alternative computer mouse design in reducing finger extensor muscle activity and concluded that changing direction of mouse switch from downward to a forward design reduced extensor muscle loading\(^9\). But the benefits of this application in radiology is unknown and should be further investigated.
References


