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Research Paper

Study of the Role of Correct Chair Armrest Position in Eliminating Neck -Shoulder Pain(NSP) in Office Workers Using Computers.

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ABSTRACT:
Background:*Neck-Shoulder pain (NSP) is frequent in the office working population. It is an important burden, with high costs in several organizations. There have been very few studies on shoulder disorders. Moreover, shoulder and neck disorders are not always distinguished, although their risk factors may differ.*
Methods:*The results presented here come from a study conducted in 2013-14among office workers exposed to repetitive work on the computer in an office set-up in an organization. The Results show that, based on clinical examination and standard questionnaire on ergonomics, & walk through assessment of the work place, followed by advice on correct posture and proper ARM Rest position helped in reducing the pain and associated morbidity to a significant extend, as compared to the control group.*
The prevalence, based on clinical examination, was high among those exposed to repetitive work, significantly higher than in the unexposed group. The objective of the present study was to examine the role of proper Armrest in preventingdevelopment of disability and associated morbidity factors for the onset of NSP.
Results:*Analyses of the association between NSP and work related physical factors, revealed that NSP was significantly associated with computer working time.*
The protective effect of rest breaks (power Naps) wasobserved in this study. Breaks allow a reduction in computer exposure, but more especially permit muscle relaxation.
The most important intervention apart from the one mentioned above was with the use of correct arm rest which in turn correct the shoulder, elbow and wrist angles, which goes a long way in correcting the NSP.
Conclusions:*the present study was done to highlight the value of simple intervention & proper follow-up, in the prevention of developing a major disability.*
Keyword:*Neck Shoulder pain (NSP), Chair arm-rest position, ergonomics,Trapezius myalgia.*

I. INTRODUCTION

Neck-Shoulder pain (NSP) is frequent in the office working population. It is an important burden, with high costs in several organizations. There have been very few studies on shoulder disorders. Moreover, shoulder and neck disorders are not always distinguished, although their risk factors may differ.

The results presented here come from a study conducted in 2013-14 among office workers exposed to repetitive work on the computer in an office set-up in an organization. The Results show that, based on clinical examination and standard questionnaire on ergonomics, & walk through assessment of the work place, followed by advice on correct posture and proper ARM Rest position helped in reducing the pain and associated morbidity to a significant extend, as compared to the control group.

The prevalence, based on clinical examination, was high among those exposed to repetitive work, significantly higher than in the unexposed group. The objective of the present study was to examine the role of proper Armrest in preventingdevelopment of disability and associated morbidity factors for the onset of NSP.

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Aim
The present study was done to highlight the value of simple intervention & proper follow-up, in the prevention of developing a major disability.

Settings and design;
A cross section of Office going personnel both male and females, who work in front of the computers in a busy office set up in Mumbai were assessed. The cases and controls were selected from this.

Subjects &Methods:
Cases;30 office workers whose occupations required repetitive work in front of the computer completed a self-administered Standard questionnaire on ergonomics about their working conditions and upper limb disorders and underwent a standardized physical examination, followed by walk through survey by the Doctor.

Selection criteria; Their criteria for selection was according to their occupational work which required them to be exposed to repetitive work in front of the computer& have NSP as initial symptom to contact the **Company doctor.**

Variables;
- There were 10 males, & 20 females, total of 30 subjects.
- The average age group between 26 to 48 years.
- None of them had any pre-existing medical illness.
- None of them had any prior Musculo-skeletal disorder like past an injury or disc etc.
- All the subjects in the sample selected worked in front of the computer for a minimum of 2-3 hours at a stretch and had NSP.
- The improvement in their symptoms after Medical intervention and correct ergonomic advisory was assessed at regular intervals.

Controls; A sample of 20 office going personnel were selected from same office.
Selection Criteria;
- There were 10 males and 10 females.
- The average age group between 26 to 48 years.
- None of them had any pre-existing medical illness.
- None had any NSP in the past 6-8 months.Nor were they recommended any correct arm rest position of their chairs.

Results:
- 25 subjects could be followed up for a period of 12 months, at a monthly interval, the incidence of the NSP was reduced dramatically after 2 months of follow up. The subjects who did not follow the correct arm rest position did not get a significant relief, but once the correct arm rest measures were initiated they too showed a significant relief.
- A follow-up after 4 weeks was done with each subject, which shows the NSP to be reducing due to correct arm rest -position.
- **The subjects who did not maintain the correct arm rest position did not show a significant symptom relief.**
- The follow up of 25 subjects was done for a period of 12 months at a monthly interval. 05 subjects could not be followed up as they had left the organization after 3 months of initial check-up.
- **The control group who were not recommended correct arm rest position began to develop NSP subsequently which was evident in the follow-up.**

II. DISCUSSION

Work related NSP is becoming more common these days with most of our jobs becoming computer-based. The most common cause being,shoulders slumped and head extended toward computer monitor. And for long periods of time, along with Incorrect position of the shoulder, elbow & the wrist either too high or too low (common position), the perfect recipe for NSP.The study indicates that women in general are at high risk for work related neck pain. Many women with neck pain develop chronic neck pain which is pain lasting more than a month. The most common affliction is called trapezius myalgia, which is a chronic muscular pain and

tightness that extends down the back of the neck and moves out toward the shoulders, another common entity was NSP at the angle of the neck with shoulder.

Jobs that may lead to chronic neck pain are those that require repetitive work, typically at computer keyboards. These jobs are primarily in administrative offices, post offices, and banks. In these positions, there is overuse and misuse of the neck and shoulder muscles.

Neck-Shoulder complaints

In this study, we found high prevalence for NSP: 45.5% of the respondents reported prevalent NSP. The prevalence of neck pain during the past 12 months in the present study is in agreement with other studies.
As subjects had to report neck pain that occurred during the past 12 months, some people could have under-reported pain due to difficulty to recall; therefore, these prevalence could have been under estimated. On the other hand, subjects with neck pain might rate their exposure higher than those without complaints. This is especially true when using self-reported data.

Work related physical factors

- Often holding the neck in a forward bent posture for a prolonged time, and often working in the same position for a prolonged time were significantly associated with NSP.A trend for a positive relation between neck flexion and neck pain, although not significant, suggesting an increased risk of NSP for those who spent a high percentage of the working time with the neck at a minimum of 20° of flexion.
- Often making the same movements per minute was significantly associated with NSP. When performing work with the hands and fingers, the muscles in the neck/shoulder region must usually act as stabilizers. Static contraction of the trapezius and other shoulder muscles is needed to keep the arms at right angles, a necessary posture when using the keyboard. This contraction is accentuated when there is also rotation or bending of the neck when the computer screen is placed to the side of the worker, not in front which is the recommended position
- A significant positive relation was found between sitting posture and neck pain. The results of the present study confirm previous findings it was found that workers who sat for more than 95% of the working time the risk of neck pain was twice as high as for worker who hardly ever worked in a sitting position,suggesting a clear relation between sitting posture and NSP.

The most common cause being, shoulders slumped and head extended toward computer monitor. And for long periods of time, along with in-correct position of the shoulder, elbow & the wrist either too high or too low (common position).

Analyses of the association between NSP and work related physical factors, revealed that NSP was significantly associated with computer working time.

- **The protective effect of rest breaks (power Naps) wasobserved in this study. Breaks allow a reduction in computer exposure, but more especially permit muscle relaxation.**
- **The most important intervention apart from the one mentioned above was with the use of correct arm rest which in turn correct the shoulder, elbow and wrist angles, which goes a long way in correcting the NSP.**

  Some more inputs on arm rests (recommended by OSHA);
  - Armrests that are not adjustable, or those that have not been properly adjusted, may expose one to awkward postures or fail to provide adequate support. For example armrests that are:
  - **Too low** may cause one to lean over to the side to rest one forearm. This can result in uneven and awkward postures, fatiguing the neck, shoulders, and back.
  - **Too high** may cause one to maintain raised shoulders, which can result in muscle tension and fatigue in the neck and shoulders.
  - **Too wide** cause one to reach with the elbow and bend forward for support. Reaching pulls the arm from the body and can result in muscle fatigue in the shoulders and neck.
  - **Too close** can restrict movement in and out of the chair.
  - **Too large** or inappropriately placed may interfere with the positioning of the chair. If the chair cannot be placed close enough to the keyboard, one may need to reach and lean forward in the chair. This can fatigue and strain the lower back, arm, and shoulder.
  - **Armrests that are made of hard materials** or that have sharp corners can irritate the nerves and blood vessels located in the forearm. This irritation can create pain or tingling in the fingers, hand, and arm.

Possible Solutions

- If the armrests cannot be properly adjusted, or if they interfere with the workstation, remove them, or stop using them.
- Position adjustable armrests so they support your lower arm and allow your upper arm to remain close to the torso. Properly adjusted armrests will be
- Wide enough to allow easy entrance and exit from the chair,
- Close enough to provide support for one's lower arms while keeping one's upper arms close to the body,
- Low enough so the shoulders are relaxed during use (Adjust the armrests so they just make contact with the lower arms when positioned comfortably at the sides.), and
- High enough to provide support for one's lower arms when positioned comfortably at one's sides. You may be able to add padding to the top of your armrests if they are too low and not adjustable.
- Armrests should be large enough to support most of the lower arm but small enough so they do not interfere with chair positioning.
- Armrests should be made of a soft material and have rounded edges.

III. CONCLUSION

The results of this study indicate that physical and psychosocial work factors, as well as individual variables, are associated with increasing frequency of NSP. These association patterns suggest also opportunities for intervention strategies in order to stimulate an ergonomic work place setting and increase a positive psychosocial work environment.

The role of the Correct Arm-Rest will go a long way in the prevention of the NSP.

Contributions;

Dr Hitesh N Shahmade 100% Contribution in the development of this article. His contribution is as follows;

- Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
- Drafting the work or revising it critically for important intellectual content; AND
- Final approval of the version to be published; AND
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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