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Research Article

OCCUPATIONAL HAZARD– CASE STUDY REPORT OF A FITTER WITH SPINE DISC LESIONS TREATED WITH PHYSIOTHERAPY

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ABSTRACT

In occupational health, safety and prevention of hazards among developing countries have much to be done. This original case study in which a fitter was treated for cervical and lumbar disc lesions with conservative physiotherapy. With an encouraging prognosis, other prophylactic aspects of rehabilitation including ergonomics were discussed.

INTRODUCTION

Poor ergonomic work habits such as prolonged constrained work position with leg, neck or spine flexion may imply a risk factor (Finsen *et al* 1998). Maintaining poor posture for long periods of time can result in chronic muscular fatigue, discomfort or pain, even if the soft tissues are not structurally altered (Pandis *et al* 2007), more significantly prolonged exposure to high static muscle and joint may lead to pathological effects and permanent disability (Valachi B, Valachi K 2003) & (Finsen *et al* 1998). Occupation of an individual is a marker of his socio economic status. Every individual strives for a better occupation but few succeed. Every occupation has its risks and dangers (Swathy Anand Sethu 2011). According to WHO the term hazard refers to an inherent property of an agent, or a situation having the potential to cause adverse effects when an organism, system or population is exposed to that agent (Durga WHO 1995). Ergonomic is a physical factor within the environment that harms the Musculo skeletal system. This is characterized by presence of comfort, disability or persistent pain in the joints, muscles, tendons and other soft parts. The risk factors comprise repeated movements and prolonged awkward or forced body posture (Durga Harutunian *et al* 2011). Physical therapy involving posture correction, ergonomic advice and stretching exercises were effective in subjects with occupational induced MSD (Pooja and Vineet 2011). Bernadino Ramazzini, father of occupational medicine in 18th century has recognized the role of occupation in the dynamics of health and diseases and occupational health hazards are not uncommon (Fasunloro & Owotade 2004).

Objective of this original study was able to a) the efficacy of physiotherapy on this subject with occupational hazard b) to study unfocussed areas of rehabilitation and ergonomics in occupational health injuries.

H/O

Non diabetic, Normotensive married gentle man employed as a fitter in a govt of India factory requiring lifting of heavy weights frequently. He is the only earning member to support his two children, wife and parents, adding stress to his physical ailment.

C/O

Pain in the neck coming down to right shoulder, giddiness on and off with turning of neck to either side and low back pain.

Investigations

- CT angiogram of the vertebral artery has shown normal report
- NMRI revealed left paracentral disc protrusion at C3, C4 and C6-C7 indenting the cal sac and at L4-L5 disc bulge causing mild compromise of bilateral neural foramina

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- Neuro physician and orthopaedic surgeons have suggested using soft cervical collar, avoiding bending, lifting activities and driving two wheeler.
- Anthropometric parameters:
- Height: 168 Cm Weight: 73 Kg Waist Circumferences: 103 Cm
- Mesomorph, social habits - non vegetarian, non alcoholic and non smoker

O/E

- Obliterated cervical lordosis
- Forward head posture
- Anteverted scapulae
- Bilateral shoulder movements end range slightly painful and restricted
- Right trapezitis positive
- Moderate weakness of serratus anterior, deltoid, rhomboids, triceps
- Bilateral hand grip were good
- Peripheral joint range of motion over elbows, wrists, hand, lower extremity joints were normal and full but for mild pain on movement of right knee with slight patella glide restriction
- Bilateral Reflex biceps ++ and Triceps ++
- Nil paresthetic sensation of both upper extremities recorded
- Pain increased with movements involving moderate weight lifting
- Cervical flexion and rotation to left increased radicular symptoms descending down the neck posteriorly up to inferior or angle of scapula, spine of scapula and over anterolateral right shoulder.
- End range cervical extension was restricted
- Mild atrophy of posterior cervical muscles
- Occasional nausea, giddiness and disturbed balance were also reported by the patient
- Obliterated lumbar lordosis along with bilateral hamstring lightness and abdominal muscle weakness were recorded.

➢ With medical management of ENT, Physician, Ophthalmologist, he was treated conservatively elsewhere with interferential therapy and cervical traction intermittently and was advised by the surgeons for surgical intervention.

➢ Since more than 18 months he is attending this center for conservative physical therapy management, he is getting treated with the following means:

1. Strengthening of shoulders, scapulae, elbows, spine with irradiation techniques of PNF
2. Shoulder bracing exercises with resistance
3. Lumbar spinal and abdominal muscle strengthening
4. Neck care
5. Closed kinematic exercises to both upper and lower extremities using Physioball
6. Core muscle strengthening with supine, side and prone plank positions using Physioball
7. Exercises to cervical spine increased symptoms, hence added only recently

Table 1 Results on neck disability index of the subject with before (Pre) treatment and post treatment with Physiotherapy

Test Neck Disability	%
Pre	80
Post	46

His present physical condition includes

1. He is able to drive two wheeler for short distance
2. Frequency of giddiness, nausea and pain in cervical spine has decreased
3. His level of self confidence increased with adequate strength to do milder weight lifting at work
4. He is however advised to follow ergonomic care for neck and lowback
5. Improved symptomatic relief the need for the subject to undergo surgical management is postponed and delayed with hope that can be avoided with further rehabilitation
6. Neck disability index has improved by 42%.

DISCUSSION

➢ Stress can elicit muscular contraction and pain especially in the trapezius muscle (Pandis *et al* 2007) head ache and back ache (Melis *et al* 2004). Meta analyses of 90 studies have shown, that frequent work – related disorders are a great problem, since the change of work conditions are recommended (kesson *et al* 1999). Occurrence of MSD, due to pain and muscle stiffness, over months and years, the body adapts to the abnormal posture caused by these muscles imbalances and maintains this unbalanced posture not only at work but in leisure activities also (Valachi B, Valachi K 2003).

➢ Prolonged static postures are thought to be associated with MSD (Peter Leggat *et al* 2007 & Ratzon 2000).

➢ Occupational stress were recorded in many studies, Dr. Albert Elis theory of rational emotive therapy (RET) where the first step deals with eliminating the stressors all together. Second step was to detect stress and figuring out ways to cope with it and improving stress management skills. Final step is to deal with recovery and rehabbing the stress altogether. These three steps are usually the most effective way to deal with stress not just in the workplace, but overall (Sally Hardy *et al* 1998)

➢ Progressive relaxation technique, which helps to establish control of thoughts, over all stress levels can be reduced significantly (Jurkat 2011)

➢ Abnormal postures including muscle imbalance, muscle necrosis, trigger points, hypo mobile joints, nerve compression and spinal disc herniation or degeneration may result in serious detrimental physiological changes in the body. These changes often result in pain, injury or possible neuro skeletal disorders like carpal tunnel syndrome (Sagar *et al* 2013)

➢ Repetitive movements of upper limbs, with exposure high load on the trapezious muscles bilaterally, as well forwards bending of the head can lead to cervical discopathy resulting in cervical pain and negative effects on Musculo skeletal system and peripheral nervous system (Peter *et al* 2007)

- Ergonomics is an applied science concerned with designing products and procedures for maximum efficiency and safety (ADA 2008) and is the study of the relationship among the personnel, equipment and environment in the work area (Russell 1973). Proper ergonomic design is necessary to prevent repetitive strain injuries, which can overtime can lead to long term disability, also it takes account of the workers capabilities and limitations in seeking to ensure that tasks, equipment information and the environment suit each worker (Pekka Kahri 2005)
- Manual material handling is considered a common type of task that increases ergonomic hazards such as neck and lowback problems (Mekaswi *et al* 2012). In developing countries occupational health and safety, hazards and illness are received less attention (Nowier *et al* 1994). Poor working conditions such as repetitive back bending while lifting objects, and twisting and pulling or pushing of heavy objects, are all to a significant impact an performance as well as postural stresses (Trink off *et al* 2003). Perform handling tasks (Lifting, Pushing and Pulling Tasks) are more likely to claim injuries to their spine and MSDS (Vincent *et al* 2005).
- The economic loss due to MSD affects not only the individual but also the organization and the society as a whole (Kemmlert 1994).
- Musculoskeletal disorders are injuries affecting muscles, tendons, ligaments and nerves. Which includes neck strain, lowback strain, tendonitis (Jaspreet *et al* 2012) and working environment and the development of MSD results in significant sickness, absence and reduced productivity (Buckle & Deverux 1999).
- MSD proved to be a major problem for modern industrialized countries can generate short term advantages such as cost reduction and productivity improvement as well as long term benefits from increased employee motivation and reduced absence due to sickness and reduced insurance costs (Markku & Waldemar 1993).

The main purpose of this case study with cervical and lumbar disc lesion following occupational hazard, the following unfocused area to be addressed:

1. Standardization of optimal weight skilled worker can lift, and lumbar of items Indian scenario
2. Repetition of movements at work can be minimized with automation with advanced technology
3. Psychosocial and economic impact of occupational health on individual and family needs to be considered by the medical fraternity and the employer
4. Conservative rehabilitation of the subject towards enhanced quality of life be given a priority
5. Creating an awareness among employers and employees requiring manual work with potential occupational hazards they are likely to develop
6. Prophylactic means from Musculo skeletal disorder with an ergonomically designed work environment

CONCLUSION

Though this case study subject has benefited with conservative physiotherapy for his cervical and lumbar disc lesions, focus on ergonomics and posture, needs to be addressed for continued betterment of the subject for overall benefit.

Further studies on an analysis of amount, repetition of weight lifted daily at work, evaluation on posture, ergonomics are recommended.

Limitations of this being case study, and only physiotherapy aspect the subject was treated. Work injury prevention programs (Jafry & Neil 2000) and reduction of physical exposure to the MSD risk factors are highly recommended among respective manual works (Malikraj *et al* 2011)

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