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Ergonomics and Physiotherapy Intervention for an Office Worker with Repetitive Strain Injury: A Case Study on Workplace Wellness Improvement

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Abstract

Repetitive strain injuries (RSIs) have become a significant concern in modern office environments, particularly among workers who spend extended periods using computers in suboptimal ergonomic setups. This study focuses on a 42 years old male office worker who developed RSI affecting his right wrist, forearm and shoulder. The injury arose due to prolonged computer usage with poor workstation ergonomics and inadequate movement breaks. A comprehensive 12-week intervention combining ergonomic adjustments and targeted physiotherapy was implemented. Results showed significant improvements in pain reduction, range of motion (ROM), strength, and work productivity. This case study highlights the importance of a holistic approach that integrates ergonomics and physiotherapy to improve workplace wellness and mitigate the risk of musculoskeletal disorders (MSDs) among office workers. Keywords: repetitive strain injury; office ergonomics; physiotherapy; workplace wellness; case study.

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Introduction

The incidence of Repetitive strain injuries (RSIs) is increasing at an exponential rate among the office workers spending considerable time in their offices in the absence of user friendly ergonomic furniture [1]. Musculoskeletal stress is implied on the workers subjected to frequent typing and mouse use. In the absence of ergonomic furniture prolonged working in such conditions can lead to disorders of the wrist, forearm, shoulder and neck. Prolonged sitting during work hours without adequate movement during these hours subject the users to develop musculoskeletal conditions [2-4].

Sunstantial economic costs to employers, decreased productivity, and increased absenteeism emanate from RSIs. The improvement in these conditions can be achieved by physical therapy interventions and the usage of ergonomic interventions. These interventions have been shown to reduce the incidence and the risk of injury among the workers. Although the individual impact of physical therapy and ergonomic adjustments have been individually studied, their combine effect in mitigating the risk of RSIs need further studies [5,6]. This case study presents a 42 years old male office worker who developed RSI due to his continued work habits. It assesses the effectiveness of physiotherapy and ergonomic adjustment which were employed to improve his overall wellness [4,7].

Case Presentation

Patient/Worker Information: The subject, a 42 years old right hand dominant male data entry analyst, working in a corporate office for over a decade, spends approximately 7-8 hours working at a desktop computer which involves extensive keyboard and mouse use with minimal breaks for movement or stretching.

Presenting Complaint: The pain in the right wrist and forearm of the worker started to worsen over the last 6 months. The pain was dull at first but progressively evolved into sharp, intermittent pain. Occasional stiffness in the shoulder and tingling in the fingers especially after extended typing sessions. Using the Numeric Pain Rating Scale (NRS) during work, the pain was rated as 5/10 with an increase up to 7/10 at the end of the workday [8].

History

No significant previous medical history was present. The worker reported fixed posture with minimal breaks for movement. The presence of ergonomic future in the workplace was almost none. This forced the worker to strain his neck, the worker had no prior surgeries or treatments for musculoskeletal pain and engaged in moderate physical activity (two jogging sessions per weeks). No family history regarding musculoskeletal conditions were reported or present.

Physical Examination & Baseline Assessment

Observed Posture: Posture position was forward leaning along with trunk. Right shoulder was elevated and the forearm was pronated while using the mouse. The wrist was extended in a non-neutral position.

Range of Motion (ROM)

Shoulder (right): Flexion 160°, abduction 150° (left shoulder flexion 180° and abduction 180°).

Wrist: Range of motion complete, but discomfort at end range of wrist flexion/extension.

Strength (Manual Muscle Testing)

Wrist extension: 4/5.

Forearm supination: 4/5.

Shoulder external rotation: 4/5.

Special Tests

Phalen's Test: Positive after prolonged typing, median nerve involvement suggested [9].

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Median Nerve Distribution: The mild tingling sensation in the fingers are suggestive of carpal tunnel syndrome [8].
Ergonomics Audit: The workstation setup was found to be suboptimal
Monitor: Positioned ~10 cm below eye level.
Keyboard: Located at an inappropriate height for the worker's elbow level.
Mouse: Positioned too far forward, forcing overreaching.
Chair: Lumbar support absent leading to poor posture.
Breaks: No formal movement breaks or stretching routine were implemented.

Self-Reported Productivity: Worker reported a delay of about 10 minutes in everyday tasks and also called in for a sick leave in the past-6 months due to arm and shoulder pain.

Diagnosis

The diagnosis was of repetitive strain injury (RSI) affecting the dominant upper limb, aggravated by poor ergonomic workstation setup and repetitive motions from keyboard and mouse. Early signs of median nerve irritation were observed due to work related RSI [8].

Intervention: The need for comprehensive physical therapy intervention was mandated consisting of ergonomic adjustments and the program was delivered over 12 weeks with regular monitoring and assessments.

1. Ergonomic Adjustment
Chair: Height adjustable chair with lumbar support.
Monitor: Monitor to be slightly below the user's eye level and screen places at approximately 50-70cm to minimize neck strain.
Keyboard and Mouse: Installation of a keyboard tray ensured the keyboard to remain at elbow height and vertical ergonomic mouse was introduced to improve wrist alignment.
Micro-Breaks: A schedule involving 2 minutes break every 30 minutes of typing with an additional 5-minute stretching break every hour.
Posture Education: The worker was advised to maintain neutral wrist posture, proper seating and movement during work.
2. Physiotherapy Programme: Pain reduction, mobility restoration and strength enhancement were considered while devising physical therapy interventions aimed at progressive rehabilitation.
Weeks 1–4 (Pain Relief and Mobility): For the forearm flexors and extensors, mild stretches and soft tissue mobilization were performed alongwith shoulder pendulum exercises to maintain mobility. Postural education was also emphasized.
Weeks 5–8 (Strengthening): Moderate, endurance focused exercises for the extensor and flexor compartment of the forearm were introduced along with forearm supination and pronation. Mild resistance was also added. Scapular stabilization movements were also added.
Weeks 9–12 (Functional Integration): Physiotherapy focused on the task specific movements which included typing posture and mouse use. Wrist and forearm were strengthened using resistance exercises. Home exercise program was advised at a time period beyond 12 weeks.

Monitoring

Pain was monitored weekly using the NRS.
Functional assessments were conducted twice a week using standardized computer tasks.
Physiotherapy attendance and adherence to the micro-break regime were tracked.

Outcome and Follow-Up

At the end of the 12-week intervention:
Pain: Improvements in the pain rating were noted with an improvement form 5/10 to 1/10 during work and 7/10 to 2/10 after work.
Range of Motion: Shoulder flexion and abduction improved to 178° and 175° respectively.
Strength: The strength of wrist extension and forearm supination improved to 5/5.
Productivity: No additional sick leave in the following 3 months was reported and the worker returned to baseline task completion time.
Ergonomics Adherence: An increase in the compliance to about 90% was recorded due to micro breaks and posture corrections.
No recurrence of symptom was recorded at 6 months follow-up as per worker report. Home exercise and stretching regimen was continued and workstation ergonomics remained optimally adjusted.

Discussion

The importance of combining the ergonomic adjustment alongwith physical therapy interventions to manage and prevent RSI in office workers was underscored in this case study [10]. Pain intensity, ROM, strength improvement and productivity enhancement were reported following this treatments strategy. The combination of physical therapy and ergonomic adjustments proved to be successful in this case. Valuable insights were obtained following this case study in a real-world setting. The worker also felt significant pain relief, and increased productivity underpinning the benefits of treating musculoskeletal health problems among office workers [11].

Key Learning Points:
Ergonomics Audit: For addressing the risk factors at workplace, early ergonomic assessments are crucial.
Posture Education and Micro-Breaks: The need of low cost interventions like micro breaks and posture education can significantly reduce musculoskeletal symptoms.
Phased Physiotherapy Approach: The recovery and functionality greatly benefitted from the progressive nature of the physiotherapy intervention, from pain control to strengthening and functional integration.
Limitations: The generalizability in the findings is compromised as the study focuses on a single individual only. The availability of ergonomic and physical therapy interventions also varies across different settings.

Conclusion

This study focuses on the combination of physical therapy and ergonomic adjustments strategies to tackle RSIs and improve overall wellness in the work setting. This strategy not only addressed pain and dysfunction but also enhanced productivity. Similar strategies should be adopted by employers and healthcare providers to reduce the incidence of musculoskeletal injuries among office workers.

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Conflict of Interest: The authors declare no conflicts of interest.

Ethics and Consent

Informed consent was obtained from the worker for the publication of this case study. The institutional occupational health protocols were considered for the conduction of experimentation. No ethics committee approval was necessary.

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