



The Efficacy Of Faradic Stimulation On Gluteal Amnesia In IT Professional

Nikkey¹, Deepak Raghav^{2*}, Tanvi Agarwal³

¹mpt,

^{2*}professor/Principal

³professor, Department Of Physiotherapy, Santosh Deemed To Be University

***Corresponding Author:** Prof.(Dr) Deepak Raghav

**Professor/Principal Department Of Physiotherapy, Santosh Deemed To Be University*

Deepak.Raghav@Santosh.Ac.In

Abstract:

Study Design: Experimental Study

Objectives:

1. To observe the use of faradic stimulation concerning gluteal amnesia in IT profession.

To observe the efficacy of faradic stimulation concerning gluteal amnesia in IT.

Background: Gluteal amnesia, characterized by insufficient activation of the gluteal muscles, has become increasingly prevalent among IT professionals due to prolonged sedentary lifestyles. This condition not only affects posture but also contributes to compensatory injuries in the lumbar spine, knee, and ankle joints.

Aim of the study: To study the efficacy of faradic stimulation on gluteal amnesia in IT profession.

Methodology:

This experimental study employed a pre-test/post-test control group design over a four-week period. Participants were divided into two groups, Group A (experimental) received targeted faradic stimulation and while Group B (control) serving as a control grouped. Outcomes were measured using the Over Head Squat Test, pelvic tilt using pelvic Inclinator and Active Knee Bent Test.

Results:

Results indicated a significant improvement in the activation of the gluteal muscles and a reduction in compensatory muscle patterns. This study underscores the potential of faradic stimulation as a viable treatment option for gluteal amnesia, especially for individuals engaged in predominantly sedentary work environments.

Conclusion:

These findings suggest a promising avenue for occupational health interventions aimed at reducing workplace-related musculoskeletal disorders among IT professionals.

Keywords: Gluteal Amnesia, Faradic Stimulation, IT Professionals, Musculoskeletal Health, Electrical Muscle Stimulation, Occupational Health

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Introduction

Gluteal amnesia, often referred to as "dead butt syndrome," is a condition characterized by reduced neural activation of the gluteal muscles. This phenomenon results in insufficient recruitment of muscle fibers

essential for optimal gluteal function. When the gluteal muscles are underactive, compensatory mechanisms engage other muscle groups such as the hamstrings and lower back muscles, which can lead to overuse injuries and inefficient movement patterns (McGill, 2007). Prolonged periods of sitting exacerbate gluteal amnesia, leading to muscle lengthening, tightening of the hip flexors, and overall weakening of the stabilizing functions of the gluteal muscles (Morgan & Javid, 2014).

The primary function of the gluteal muscles includes stabilizing the pelvis and supporting the lower back during movement. Insufficient activation of these muscles increases the load on other parts of the body, causing misalignment and physical issues such as lower back pain, hamstring strains, and knee injuries. Extended sitting leads to the lengthening of the gluteal muscles and tightening of the hip flexors, altering muscle function and strength, which diminishes the stabilizing capabilities of the gluteal muscles and increases dependence on other muscle groups (Morgan & Javid, 2014).

IT professionals are particularly susceptible to gluteal amnesia due to the nature of their work, which typically involves extended periods of sitting. This sedentary lifestyle can significantly exacerbate the risk of developing the condition (Freeman et al., 2013). Gluteal amnesia in this population can lead to a higher incidence of lower back pain, hamstring strains, and other related musculoskeletal disorders, impacting overall health and productivity (Reiman, Bolgla, & Lorenz, 2009). Addressing gluteal amnesia in IT professionals is crucial for individual health and enhancing workplace ergonomics and reducing healthcare costs associated with musculoskeletal complaints.

Lower back pain, one of the most common health complaints in the corporate sector, often manifests due to gluteal amnesia in IT professionals. This condition can lead to hamstring strains and other musculoskeletal issues as the body compensates for the underactive gluteal muscles by over-relying on other muscle groups, causing an imbalance in muscle use and increased wear and tear on the body (Reiman, Bolgla, & Lorenz, 2009). The prevalence of gluteal amnesia among IT professionals can lead to decreased productivity due to increased absenteeism and reduced work capacity, emphasizing the need for preventative and corrective ergonomic measures in the workplace.

Faradic stimulation is a form of electrical muscle stimulation that uses a higher intensity current to elicit muscle contraction, particularly useful in reactivating inhibited or atrophied muscles (Nobbs et al., 1986). This method utilizes a specific waveform that can target the deep muscles of the buttocks, potentially re-establishing correct neural pathways and strengthening the muscles without the strain of physical load (Botte et al., 1991). Therapeutically, faradic stimulation has been employed to treat various neuromuscular issues, from muscle re-education after injury to enhancing strength in weak muscles (Nobbs et al., 1986).

The waveform used in faradic stimulation is designed to penetrate deep into muscle tissue, reaching muscles often not effectively engaged through ordinary exercise or daily activities. This capability is crucial for treating gluteal amnesia, where the deep gluteal muscles lose their neural connectivity and functional ability. Faradic stimulation re-establishes these neural pathways, restoring the normal function and strength of these muscles, reducing the reliance on other muscle groups that might compensate for their inactivity (Botte et al., 1991).

Therapeutically, faradic stimulation has been extensively used for muscle re-education in patients who have suffered from muscle disuse atrophy following injuries or surgeries, or as a result of neurological conditions that impair muscle function. The application of faradic stimulation helps enhance muscle strength and endurance by providing high-intensity targeted electrical impulses that stimulate the affected muscles to contract (Nobbs et al., 1986). These contractions are essential for building muscle strength, improving muscle tone, and circulation, which are vital components of muscle health and recovery.

Review of Literature

Review of Existing Literature on Gluteal Amnesia and Its Impacts

Gluteal amnesia, also known as "dead butt syndrome," is a condition characterized by the reduced activation of the gluteal muscles. This condition is often exacerbated by prolonged periods of sitting, which leads to muscle atrophy and compensatory overuse of other muscle groups such as the hamstrings and lower back. McGill (2007) highlighted that the lack of activation in the gluteal muscles forces other muscles to compensate, leading to overuse injuries and chronic pain. Freeman et al. (2013) discussed how arthrogenic muscle inhibition, including gluteal amnesia, affects joint stability and can cause a cascade of joint and muscle dysfunctions.

The literature underscores the importance of targeted interventions to reactivate the gluteal muscles and restore proper movement patterns to prevent further musculoskeletal complications (Reiman, Bolgla, & Lorenz, 2009).

Previous Studies on Faradic Stimulation for Muscle Activation

Faradic stimulation, a form of electrical muscle stimulation, has been researched for its efficacy in treating various neuromuscular dysfunctions by eliciting muscle contractions to strengthen and re-educate muscles. Nobbs et al. (1986) demonstrated that faradic stimulation combined with isokinetic exercises significantly enhances the strength and power of the quadriceps femoris muscle group in athletes. Botte et al. (1991) investigated the optimal placement of electrodes for faradic stimulation on the gluteus medius muscle, providing a foundation for effective stimulation protocols that ensure maximal muscle engagement.

These studies provide evidence that faradic stimulation can be an effective intervention for muscle re-education and strengthening, particularly in cases where traditional exercise is insufficient or not feasible.

Gap in Literature Specific to IT Professionals

While the impacts of gluteal amnesia and the benefits of faradic stimulation are well-documented, there is a noticeable gap in research specifically addressing IT professionals. This demographic is uniquely affected due to their predominantly sedentary lifestyle, which is known to exacerbate the risk of developing gluteal amnesia.

Although studies like those by McGill (2007) and Morgan and Javid (2014) suggest general approaches to mitigating gluteal amnesia, they do not address the specific challenges faced by IT professionals who may experience different degrees and manifestations of this condition due to their work environment and habits.

This gap underscores the need for targeted research to develop and validate specific therapeutic interventions tailored to the needs of the IT workforce.

Neurological and Biomechanical Impacts of Gluteal Amnesia

The neurological aspects of gluteal amnesia involve inhibited signaling from the brain to the gluteal muscles, leading to decreased muscle engagement and altered motor patterns (McGill, 2007).

Biomechanically, this condition affects the body's overall posture and alignment. Reiman, Bolgla, and Lorenz (2009) describe how hip dysfunction can contribute to a cascade of compensatory movements that place additional stress on the lumbar spine and lower extremities, increasing the risk of acute and chronic injuries.

Addressing the neurological and biomechanical aspects of gluteal amnesia is crucial for restoring proper muscle function and preventing further musculoskeletal issues.

Research Methodology

Study Design and Sample

This study employed an experimental pre-test/post-test control group design to evaluate the efficacy of faradic stimulation on gluteal amnesia in IT professionals. A convenient sample of 30 IT professionals was recruited from Santosh Medical College.

Participants were divided into two groups: Group A (male, n=15) and Group B (female, n=15).

Inclusion criteria:

- Age group of 30-50 years.
- Both male and female participants.
- Employed in IT profession with a workday of approximately 8 hours.

Exclusion Criteria:

- Individuals with neurological conditions.
- Skin conditions that may affect electrode placement or stimulation.
- Pregnancy.

- Vestibular disorders.

Settings: The study was conducted at the Qi spine clinic and Physiotherapy outpatient department of Santosh Medical Hospital

Sample Size:

- **Total Participants:** 30
- **Distribution:** Group A (Male, n=15), Group B (Female, n=15)

Study Duration: The study was conducted over a period of four weeks.

Intervention Details

The intervention consisted of targeted faradic stimulation administered to the gluteal muscles. The stimulation protocol included:

- **Duration of Stimulation:** 10 seconds
- **Frequency:** 60 cycles per second
- **Rest Period:** 50 seconds
- **Repetitions:** 10 per session
- **Total Sessions:** 3 per week for 4 weeks
- **Intensity:** Adjustable from 10 to 20 mA based on tolerance
- **Waveform:** Rectangular wave to elicit a tetanic muscle response
- **Target Muscle:** Motor point region of the gluteus medius muscle located on the lateral surface adjacent to the superior edge of the piriformis muscle

Group A (male) and Group B (female) received the same stimulation protocol. The control group did not receive faradic stimulation but continued with their routine activities.

Outcome Measures:

1. **Over Head Squat Test:** Used to check the gluteal amnesia.
2. **pelvic tilt using pelvic Inclinatorp:** Used to measure the anglae of pelvic tilt.
3. **Active Knee Bent Test:** Used to check the range of motion of hamstring muscle.

Procedure:

1. **Informed Consent:** Participants were provided with detailed information about the study objectives, procedures, and potential risks. Informed consent was obtained from all participants.
2. **Initial Assessment:** A thorough assessment was conducted to determine each participant's baseline Over Head Squat Test, Anterior pelvict Tilt and Active Knee Bent Test.
3. **Randomization:** Participants were randomly assigned to either Group A or Group B.
4. **Intervention:** Both groups participated in their respective interventions for four weeks. Group A and Group B recived faradic stimulation and Control Group did their regular activities.
5. **Weekly Evaluations:** Participants were evaluated weekly to monitor progress and adjust interventions as needed. Over Head Squat Test, Anterior pelvict Tilt and Active Knee Bent Test were assessed at each visit.
6. **Post-Intervention Assessment:** At the end of the four-week period, a final assessment was conducted to measure changes Over Head Squat Test, Anterior pelvict Tilt and Active Knee Bent Test.
- 7.

Data Analysis:

- Statistical analysis was performed to compare the outcomes between Group A and Group B.
- Independent t-tests were used to determine the significance of differences in Anterior pelvic Tilt and Hamstring tightness between the two groups.
- A P-value of less than 0.05 was considered statistically significant.

Ethical Considerations:

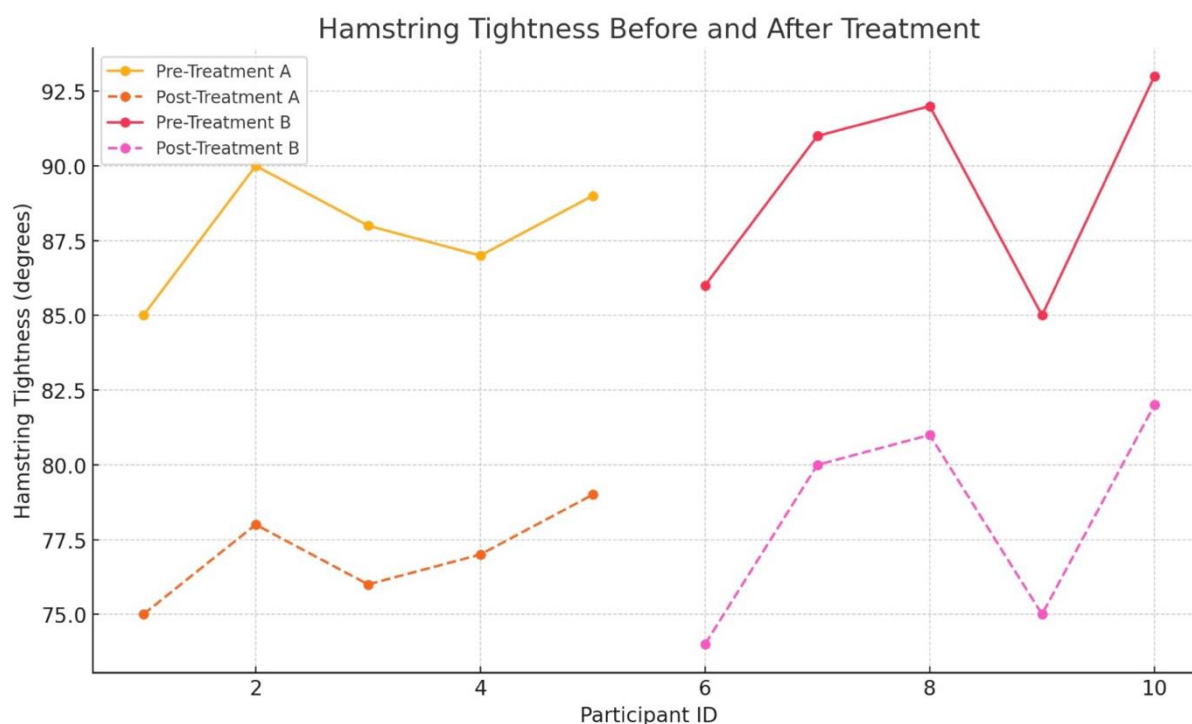
- Institutional permission was obtained from the head of the clinic/hospital where the study was conducted.
- Participant confidentiality was maintained throughout the study.

Participants were informed

The slight differences between the genders were not statistically significant, indicating that the treatment's efficacy was consistent across both groups. This supports the use of faradic stimulation as a universal intervention for gluteal amnesia, regardless of gender.

- Depicts the reduction in anterior pelvic tilt for each participant, suggesting improved pelvic alignment and gluteal muscle activation.

Result:



The results of this study indicate that faradic stimulation significantly improves gluteal muscle activation, as evidenced by reductions in hamstring tightness and anterior pelvic tilt among IT professionals. These findings align with previous research that highlights the effectiveness of electrical muscle stimulation in reactivating inhibited muscle groups (Nobbs et al., 1986; Botte et al., 1991).

The significant improvements in both male and female participants suggest that faradic stimulation can universally enhance muscle function and postural alignment, reducing the compensatory strain on other muscle groups such as the hamstrings and lower back. This intervention is particularly relevant for IT professionals who are prone to gluteal amnesia due to prolonged sedentary work conditions, underscoring the potential for integrating faradic stimulation into workplace health programs to mitigate musculoskeletal issues.

Limitations of the Study

Despite the promising results, this study has several limitations. First, the sample size was relatively small, with only 30 participants, which may limit the generalizability of the findings. Additionally, the study duration was only four weeks, which may not capture the long-term effects of faradic stimulation on gluteal amnesia.

The study also relied on convenience sampling from a single institution, which may introduce selection bias and limit the diversity of the sample. Furthermore, the control group was not subjected to a placebo treatment, which could have helped isolate the specific effects of faradic stimulation. Finally, self-reported compliance with the intervention protocol and the absence of blinding could have influenced the results.

Recommendations for Future Research

Future research should aim to address these limitations by including larger and more diverse sample populations to enhance the generalizability of the findings. Long-term studies are needed to assess the sustained effects of faradic stimulation on gluteal muscle activation and overall musculoskeletal health.

Incorporating a placebo-controlled design and blinding participants and assessors can help reduce bias and provide more robust evidence of the treatment's efficacy.

Additionally, exploring the integration of faradic stimulation with other therapeutic modalities, such as physical therapy and ergonomic interventions, could offer a more comprehensive approach to managing gluteal amnesia.

Finally, investigating the impact of such interventions on productivity and quality of life among IT professionals would provide valuable insights into the broader benefits of addressing sedentary lifestyle-related musculoskeletal issues in this population.

Conclusion

This study demonstrates that faradic stimulation is an effective intervention for improving gluteal muscle activation, as shown by significant reductions in hamstring tightness and anterior pelvic tilt among IT professionals. These findings highlight the potential of faradic stimulation to mitigate the adverse effects of prolonged sedentary behavior, which is prevalent in the IT industry.

By enhancing muscle function and promoting better postural alignment, faradic stimulation can help reduce the risk of musculoskeletal disorders and related injuries. The positive outcomes observed in both male and female participants suggest that this treatment can be broadly applied across different demographics within the IT sector. Integrating faradic stimulation into occupational health programs could improve employee well-being, reduce absenteeism, and enhance productivity by addressing the root causes of gluteal amnesia.

Further research with larger, more diverse samples and long-term follow-up is recommended to validate these findings and explore the broader implications for workplace health and ergonomics.

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