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ORIGINAL ARTICLE

Association of Rhomboid Muscle Spasm and Neck Pain among Occupational Bike Riders

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ABSTRACT

Background: Occupational bike riders, who spend extensive hours riding and navigating through traffic, are especially prone to developing muscle spasms and neck pain. The rhomboid muscles, located between the shoulder blades, play a crucial role in stabilizing the shoulder blades and maintaining proper posture.
Aim: To find the association of rhomboid muscle spasm and neck pain among occupational bike riders.
Methods: This cross-sectional study was conducted among occupational bike riders in Lahore over a duration of four months. The study population consisted of 100 male riders aged 18-40 years, who completed at least 10 rides daily. Non-probability convenient sampling was employed. Data was collected using the Neck Disability Index (NDI) and the Numeric Pain Rating Scale. Data analysis was performed using SPSS version 25.
Results: The results showed a mean age of 28.92±6.81 years. The Neck Disability Index results indicated that 3.4% reported no disability, 18.1% mild disability, 50% moderate disability, 25.9% severe disability, and 2.6% complete disability. Pain intensity ratings revealed that 9.5% experienced no pain, 19% mild pain, 39.7% moderate pain, 28.4% severe pain, and 3.4% reported the worst imaginable pain ($p = 0.021$).
Conclusion: Current study concluded that in occupational bike riders there is association of rhomboid muscle spasm and neck pain among occupational bike riders indicates a significant prevalence of musculoskeletal issues within this population. The findings suggest that frequent and prolonged riding contributes to increased muscle tension and spasms in the rhomboid region, which correlates strongly with reported neck pain.
Keywords: Rhomboid muscle spasm, neck pain, occupational bike riders, neck disability index, musculoskeletal issues

INTRODUCTION

The advent of ride-sharing services has revolutionized urban transportation, providing flexible job opportunities for many. Among these, occupational bike riders represent a growing workforce that faces unique occupational hazards due to the nature of their work[1]. One significant health concern for this group is the high incidence of musculoskeletal disorders, particularly rhomboid muscle spasms and neck pain. The rhomboid muscles, which connect the shoulder blades to the spine, play a crucial role in maintaining proper posture and facilitating upper back and shoulder movements[2].

Motorcycling is not just a mode of transportation but a lifestyle, passion an even a source of earning for many people around the world. Whether cruising on open roads, navigating through urban traffic, or tackling challenging terrains, motorcycle riding offers a sense of freedom, adventure, and most important the bread and butter for one's home[3]. However, along with many benefits of riding a motor cycle, comes the potential for musculoskeletal issues, including rhomboid muscle stiffness, which can significantly impact the riding experience and overall well-being of motorcycle users[4].

Before delving into the details of rhomboid muscle stiffness in motorcycle riders, it's essential to understand the anatomy and function of these muscles. The Rhomboid Muscle is a skeletal muscle of the back that connects the scapula with the vertebrae of the spinal column. It originates from the spinous processes of the thoracic vertebrae T2–T5 and supraspinous ligament; it inserts onto the lower portion of the medial border of the scapula[5]. It acts together with the rhomboid minor to keep the scapula pressed against thoracic wall and to retract the scapula toward the vertebral column. As the word rhomboid suggests, the rhomboid major is diamond-shaped. The major in its name indicates that it is the larger of the two rhomboids[6].

Rhomboid muscle stiffness due to continuous motorbike riding can present with various signs and symptoms that indicate muscle strain and discomfort in the upper back area. Common signs and symptoms of rhomboid muscle stiffness in motorbike riders include persistent upper back pain, which can be localized between the shoulder blades or in the upper back region[7]. This pain may intensify during or after long rides, especially if the rider maintains a static or hunched posture for extended periods. Restricted range of motion is another prevalent symptom, leading to difficulty in turning the head from side to side, checking blind spots, or performing manoeuvres that require full shoulder mobility[8].

Several factors contribute to the development of rhomboid muscle spasms and neck pain among occupational bike riders. The primary cause is the prolonged and repetitive posture maintained while riding, which places continuous strain on the upper back and neck muscles. The forward-leaning position required to handle the motorcycle handlebars can lead to muscle fatigue and imbalance, particularly in the rhomboid and trapezius muscles(9). Additionally, the vibrations from the motorcycle and the need to constantly adjust balance and posture while navigating traffic further exacerbate muscle tension and discomfort. Inadequate ergonomic design of the motorcycle, such as poorly positioned handlebars and seats, can also contribute to poor posture and increased muscle strain[10].

Rhomboid muscle spasms and neck pain can have a profound impact on the overall well-being and job performance of occupational bike riders. Chronic pain and discomfort can lead to decreased concentration, increased stress, and a higher risk of accidents due to impaired motor control. Additionally, the persistent pain can result in absenteeism and reduced work hours, ultimately affecting the riders' income and quality of life[11]. The psychological impact should not be underestimated, as chronic pain conditions are often associated with anxiety and depression. The cumulative effect of these physical and psychological factors can lead to a significant decrease in job satisfaction and an increased turnover rate among occupational bike riders[12].

Research indicates that up to 60% of bike riders experience some form of neck or upper back pain during their careers. Among occupational bike riders, the prevalence of rhomboid muscle spasms is notably high, often co-occurring with neck pain. This is attributed to the extended periods spent on the bike, often without adequate breaks, leading to muscle fatigue and overuse[13]. The repetitive nature of the tasks, combined with the physical demands of navigating through traffic and the constant need to maintain balance, contributes significantly to the development of these musculoskeletal issues[14].

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With the best of researchers knowledge there is dearth of literature available on this topic in Pakistan. Therefore, current study aims to create a clear and focused examination of the potential link between the occupational demands of occupational bike riding and the development of neck pain and rhomboid muscle spasms, leading to more targeted and effective recommendations for prevention and management within this worker population.

The objective of this study was to find the association of rhomboid muscle spasm and neck pain among occupational bike riders.

METHODOLOGY

This cross-sectional study was conducted among occupational bike riders in Lahore over a duration of four months following the approval of the study synopsis. A sample size of 100 participants was determined using a prevalence of 30%, a margin of error of 0.007, and a level of significance of 1.962, with non-probability convenient sampling employed to recruit participants. The inclusion criteria focused on active male bike riders aged 18–40 years who had traveled long distances and completed at least 10 rides daily, while those with neck or shoulder trauma, systemic conditions such as rheumatoid arthritis, or who rode bikes for leisure were excluded.

Data collection was performed using the Neck Disability Index (NDI) to assess neck-specific disability and the Numeric Pain Rating Scale (NPRS) to measure pain intensity. Data analysis was carried out using SPSS version 25, with descriptive statistics such as mean and standard deviation used for demographic data and categorical variables. Pearson's chi-square test was applied to determine associations, with a level of significance set at $P<0.05$. Numeric variables were expressed as mean ± standard deviation, and a P-value less than 0.05 was considered statistically significant.

RESULTS

Table 1: Statistics of age

Statistics of age	
Mean	28.90
Std. Deviation	6.81
Minimum	18.00
Maximum	40.00

Table 2 Neck disability index_ total

Neck disability index_ total	**Frequency**	**Percent**
No disability	4	3.4
Mild disability	21	18.1
Moderate disability	58	50.0
Severe disability	30	25.9
Complete disability	3	2.6
Total	116	100.0

Table 3: Numeric pain rating scale

Numeric pain rating scale	**Frequency**	**Percent**
No pain	11	9.5
Mild pain	22	19.0
Moderate pain	46	39.7
Severe pain	33	28.4
Worst imaginable pain	4	3.4
Total	116	100.0

Table 4 Association between rhomboids muscle spasm and neck pain

Chi-Square Test	**Value**	**N**	**P value**
Pearson Chi-Square	29.465	100	.021

In above table association between rhomboids muscle spasm and neck pain among occupational bike riders is mention in which obtained p value (0.021) which showed that there is significant association found between rhomboids muscle spasm and neck pain.

DISCUSSION

In comparison to previous studies, obtained results showed that age show a mean age of 28.92± 6.81 years. The age range spans from a minimum of 18 years to a maximum of 40 years. Results obtained from Neck Disability Index (NDI), reflecting the level of disability related to neck function. Approximately 3.4% reported no disability, while 18.1% indicated mild disability. Furthermore, 50% reported moderate disability, and 25.9% experienced severe disability. Additionally, 2.6% reported complete disability. According to pain intensity ratings using a numeric pain rating scale show that approximately 9.5% of participants reported experiencing no pain, while 19% indicated mild pain. Furthermore, 39.7% reported moderate pain, 28.4% experienced severe pain, and 3.4% described their pain as the worst imaginable (p value 0.021).

According to V. Lewis et al., 2023 it was determined that majority of bike riders experience neck pain and 55% had rhomboid muscle spasms, and the male subjects had disproportionately affected incidences than female subjects. Speaking of the relations between bicycle usage and musculoskeletal discomfort, it is possible to admit that bike hours negatively influence neck pain (r = 0. 68), and poor bike position correlates with rhomboidal spasms (r = 0. 55). There were noted differences in the prevalence of self-reported pain in the respondents who got poorly fitted bikes; the rate of neck pain was 85%, and the rhomboid spasms 70%, while health discomfort was lower in the case of properly fitted bikes with 60% of the respondents pointing out neck pain and 45% rhomboid spasms (15). Measures that were used in this study, such as stretching, and particular types of strengthening exercises, proved to be effective, as evidenced by the results, including the reduction of the cases of neck pain by half and rhomboid spasms by 40% in comparison with the examinees who did not stretch and exercise, with an incidence of 85% and 70%, respectively[16].

According to Bell-Jenne et al., the study findings indicate a high prevalence of rhomboid muscle spasm among bike riders, highlighting a significant association with neck pain. Cyclists who participated in the study reported frequent episodes of muscle spasm, often characterized by acute pain between the shoulder blades, extending towards the neck and upper back. This pain was described as sharp and persistent, particularly during and after long rides. The data suggests that the repetitive strain and sustained posture required in cycling contribute to the high incidence of muscle spasms. These findings are consistent with previous research, such as the work by Clarsen et al. (2010), which also identified upper back pain as a common complaint among professional cyclists[17].

In 2019 M.A Diyan et al., the results underscore the critical role of cycling posture and bike ergonomics in the development of rhomboid muscle spasms. Participants who adopted a forward-leaning posture for extended periods reported higher instances of muscle spasms and associated neck pain. This posture, often necessary for aerodynamic efficiency, places continuous stress on the upper back muscles, particularly the rhomboids[18]. The study also found that improper bike fitting, including incorrect saddle height and handlebar reach, exacerbates muscle strain. Riders with poorly adjusted bikes experienced more frequent and severe symptoms, emphasizing the need for individualized ergonomic adjustments. These findings align with the biomechanical analysis by Van der Wal et al (2014), which highlighted the impact of cycling posture on muscle strain[19].

CONCLUSION

Current study concluded that in occupational bike riders there is association of rhomboid muscle spasm and neck pain among occupational bike riders indicates a significant prevalence of musculoskeletal issues within this population. The findings suggest that frequent and prolonged riding contributes to increased muscle

tension and spasms in the rhomboid region, which correlates strongly with reported neck pain.

Ethics approval and consent to participate: This study was approved by the Ethical Review Board of University of Lahore. All methods were carried out in accordance with the Helsinki Declaration.

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1. Conception and design of or acquisition of data or analysis and interpretation of data.
2. Drafting the manuscript or revising it critically for important intellectual content.
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