RESEARCH ARTICLE

FREQUENCY OF THORACOLUMBAR JUNCTION DYSFUNCTION AMONG EQUESTRIAN POLO ATHLETES

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ABSTRACT

Background: Low back pain among equestrian sports is because of the significant connection between thoracolumbar junction dysfunction (TLJD) and its commencement in equestrian sports; appearing as low back ache spreading out to the adjoining sites and structures. **Objective:** To determine the frequency of Thoracolumbar Junction Dysfunction (TLJD) among Equestrian Polo Athletes **Methods:** A descriptive cross-sectional study with a sample size of n=108 was conducted at different polo clubs of Lahore and Islamabad Pakistan for the duration of 6 months from July 2020 to December 2020. Participants were selected via non-probability convenient sampling technique. Male athletes between 18 to 50 years of age, non-competitive with mechanical low back pain were included in the study. Athletes who fulfill the inclusion criteria were assessed using Robert Maigne's Gold standard examination protocol. SPSS version 21 was used for data entrance and Descriptive analysis was done to present the results of study. **Results:** The mean age of the subjects was 36.86±6.65 years, duration in sports was 13.58±4.81 in years and frequency of participation in sports was 3.648±0.75 days per week. Total n=108 athletes were examined for TLJD, 66.7% (n=72) were found to be positive with the thoracolumbar junction dysfunction. **Conclusion:** Thoracolumbar Junction Dysfunction among Equestrian Polo Athletes was an immensely prevailing condition

Keywords: Athletes, athletic injuries, dysfunction, overuse injuries.

INTRODUCTION

Back pain is one of the most prevalent conditions among extensive population[1]. Low back pain among equestrian sports is because of the significant connection between thoracolumbar junction dysfunction (TLJD) and its commencement in equestrian sports; appearing as low back ache spreading out to the adjoining sites and structures. This phenomenon results from the probable disposal of postural malfunction for prolonged periods with flexed hips and cervical extension. This sets the sufficient evidence for TLJD in equestrian polo athletes because of their biomechanical construct[2].

Thoracolumbar Junction Dysfunction (TLJD) is often portrayed as a profound diffused aching sensation, which is ordinarily confused with various pathologies because of the heterogeneous emancipation of the disorder. TLJD is widely considered as a common disorder who remain undiagnosed[3]. This notion results in inadequate investigation and referral notification for better understanding[4]. The TLJ joints in are not generally the primary complaint of patients influenced by the disorder[5]. Equestrian polo is a well-known sport that is proceeding to gain recognition and involvement. With dynamic sport mechanics and large amplitude of vulnerability, the sport has notoriously been the provocation for the eclectic involvement of TLJ[6].

Polo is an extremely challenging Equestrian sport that requires competency of the rider as well as performance of the horse. There is a considerably less extension that can occur in the thoracic spine because of the biomechanical built and its innate constraints[7]. Along these lines, excessive loading as well as formation of pivotal junction at thoracolumbar junction lays the basis for dysfunction and disturbs the swivel of stable biomechanics; enticing further injury and limited functional activities as a consequence of torsional forces, repetitive muscle load and sustained muscle tension[8]

Understanding of the unique aspects of anatomical configuration of TLJ and force transmittal across the joint is necessary to comprehend and categorize the repetitive micro-traumatic thoracolumbar disruption[9]. The coronal oriented facet joints of thoracic spine permits rotation, whereas the facet joints of lumbar spine are sagitally orientated allowing flexion and extension distinctly restricting rotation[10]. Thus, a transition in anatomy from the zone of stability to mobility predisposes the TLJ towards injury[11]

Against the background of this study, what is needful in order to guarantee that clinically

significant thoracolumbar junction dysfunction is not missed, is the combination of physical examination in addition with the inspection of injury mechanism. This is rated as a mainstay for the detection and confirmation of TLJD. This pilot study is a case in point showcasing the weightage of clinical examination. While inspecting the thoracolumbar intersection, one should seek out tenderness upon spinous processes cautiously. Looking high and low for the presence of posterior iliac crest point tenderness and carrying out a positive pinch-roll test can likewise be advantageous. Down this route, F. Aoun et al unambiguously demonstrated that clinical assessment is authentic, factual and reproducible. This endorses the solidity and substantiality for the necessity of clinical examination[12]

The study aims to determine the frequency of thoracolumbar junction dysfunction (TLJD) among Equestrian Polo Athletes. The current study would provide the justifiable reasons for further screening and diagnosing the TLJD so that it may not be overlooked in the differential diagnosis of back pain. This would ultimately influence significant therapeutic rehabilitation protocols and less preference seeking for non-conservative management. Moreover, the outcome of this research would set the stage for further prospection on overuse injuries, sustained by equestrian polo athletes, to build up a better and safe equestrian sports and establish the framework for additional screening in different sports as well.

METHODOLOGY

The descriptive cross sectional study was carried out from July 2020 to December 2020 after the approval acquired from the ethical committee of Lahore college of Physical Therapy. Sample size was calculated to be 108 using WHO calculator with 0.0756 prevalence (P), 95% Confidence Level (1-α) and 0.05 precision (d). [13]

The included subjects were male, non-competitive athletes with chronic mechanical low back pain aged between 18 to 50 years. Athletes with a history of traumatic spinal pathology and those who were involved in multiple sports were excluded from the study. Data was collected from Lahore Polo Club, Jinnah Polo and Country Club, Lahore Garrison Saddle & Polo Club and Islamabad Club Polo Grounds via non probability convenient sampling technique.

Data was collected by identifying and screening the participants who fell into the inclusion criteria presented to the respective polo grounds. The procedure of the examination was thoroughly explained and written consent for the examination was taken from the participants. Participants were given an option to leave off at any point of the study. Athletes were analyzed and examined using gold standard Maigne's Examination[14]. The sensitivity of palpable examination is reported to be 85% for the presence of transitional zone dysfunction[15]. Maigne's examination includes close and careful examination of the spine including pain provocation upon coupled movements, palpable tenderness upon axial pressure over spinous processes of T10-L2 vertebrae, positive skin pinch and rolls test, presence of tender point over posterior iliac crest.

Data was entered and analyzed by utilizing Statistical Package for Social Sciences (SPSS) version 21. The study variables were presented in the form of descriptive statistics and result was presented in frequencies (%). Demographics of the sample was presented in the form of Mean±SD that includes Age, duration of sports participation (years) and frequency of participation in sports (days)

RESULTS

The minimum age of the subjects who participated was 20 years while the maximum age was 48 years. The Mean age of the subjects was 36.861±6.649 years. The minimum duration of playing sports of athlete is 13.58±4.81 years and the average frequency of play is 3.68±4.81 days per week.

A total of n=108 athletes screened for Thoracolumbar Junction Dysfunction, the percentage of reproducible pain on performing coupled movements is 66.7% (n=72) and no pain with coupled movement is 33.3% (n=36). Furthermore, pain upon extension and right side bending and rotation in the participants was found to be 53.7% (n=58) while percentage of participants with pain upon extension plus left side bending and rotation was 13.3% (n=14).

The n=72 athletes who exhibited painful coupled movements, 67(93%) athletes had tenderness upon axial pressure over spinous processes of T10-L2, 39

(54.2%) had positive posterior iliac crest sign and positive skin pinch and roll test, 26 (36.1%) had solely positive posterior iliac crest sign and 7(9.7%) exhibited positive skin pinch and roll test.

Table 1: shows frequency of components of Maigne's examination

Pain upon coupled movements	66.7% (n=72) Extension + right side bending = 53.7% (n=58) Extension + left side bending = 13% (n=14)
Tenderness upon axial pressure over spinous process of T10-L2	93% (n=67)
Positive posterior iliac crest sign + positive skin pinch and roll test	54.2% (n=39)
Positive posterior iliac crest sign	36.1% (n=26)
Positive skin pinch and roll test	9.7% (n=7)

DISCUSSION

The purpose of this study was to determine the frequency of most overlooked condition; thoracolumbar junction dysfunction among Equestrian Polo Athletes, through a careful history and a close clinical examination which prove to be a fundamental requirement in the diagnosis. 108 participants were quantitatively evaluated for the dysfunction, chiefly by determining reproducible pain upon couple movement i.e. extension plus side bending and rotation at the thoracolumbar juncture, 72 were found to be positive. This supports the establishment of the notion that couple movement is a principal diagnostic measure of TLJD in Equestrian

Polo Athletes[16]. Repetitive spinal loading with synchronous hip flexion and neck extension concentrating forces across the transitional TLJ and, dissimilarity in a strain mechanics are constitutive reasons of overuse injuries among equestrian athletes. Extension overload injury occurs at the thoracolumbar spine, keeping in view the posture of an equestrian polo athlete on a horse, when flexion of the hip is combined with cervical extension as in head reclined backwards and upwards (looking the playing field or assuming an erect posture from a crouched one).[7].

The previous study reported 42% frequency of the dysfunction whereas the frequency of thoracolumbar junction dysfunction in the current study is 66.7%, being significantly higher, necessitates the need of regular inspection for dysfunction in the polo athletes owing to not only their biomechanical construct but also by the same token unique anatomical configuration of the human spine[13].

The under recognized expression of TLJD in the mechanical low back pain occurrence is due to the neurological contribution of TLJ as a conducive to posterior pelvic pain. The posterior primary rami of thoracolumbar spinal nerves innerve the back skin and intrinsic muscles of the zygapophyseal joints along with the supra as well interspinous ligaments. Far-flung pain from the thoracolumbar junction is perceived in the cutaneous distribution of these nerves, particularly the gluteal region, the skin and subcutaneous tissues. Therewith, both the research reports incline towards an identical conclusion and that genesis of low back pain is at thoracolumbar junction [17].

In the current study athletes with positive dysfunction exhibit positive iliac crest sign together with positive pinch and roll skin test were 54.2% whereas 36.1% had solely positive iliac crest sign and 9.7% athletes with positive pinch and roll skin test. 93% athletes were observed with tenderness upon palpation of spinous processes of TLJ. In a previous case report, an equestrian athlete was diagnosed with the dysfunction at TLJ through the utility of structured physical examination including positive pinch and roll skin test and exquisite tenderness of TLJ vertebral spinous processes[18]. Another study based upon a clinical case, reported in a clinical setting over a stretch of time with recurrent back pain radiating to adjacent structures was diagnosed with TLJD. The diagnosis is established upon maigne's examination criteria including positive pinch and roll skin test, positive iliac crest sign and tendered spinous processes of TLJ vertebrae[19]. Supplementary, one more publication reported a case presented with flank pain. Thoracolumbar junction dysfunction was diagnosed in this case as well by observing tenderness at individual level of the spinous processes at the T10–T12 vertebrae. Localized hyperalgesia on the skin over the iliac crest was identified when a fold of skin and subcutaneous tissue was pinched and rolled[20]. Thus, the trends of these studies highlight the categorical significance of the performance of segmental examination in

accordance with the hallmark narration of the physical findings provided by a French Doctor, Robert Maigne.[21]

CONCLUSION

Thoracolumbar Junction Dysfunction is more prevalent in Equestrian Polo Athletes. Thereby, a detailed history and complete evaluation of TLJ is necessary for the elimination of an error as well as for an accurate diagnosis

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