New Applications of Fascial Findings in High-Performance Human Movement

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Introduction

Over recent decades, various mechanisms have been proposed in human movement that add to the understanding of fascia’s contribution in energy conservation and movement efficiency[1,2]. A revised view of dissection of the interacting laminae of the thoraco-lumbar fascia - including both axial and appendicular musculature - can provide clinical insight into rehabilitation processes and performance conditioning.

Recent understanding of high-performance gait, such as the importance of running above the trot-gallop transition speed as a part of Homo’s unique evolutionary niche[3], in tandem with the knowledge that, for more than 2 million years, this running was done barefoot[4], imply limitations to some of the earlier fascial mechanisms described.

In parallel, the thoracolumbar fascia’s role in human core function has been explored in depth, but mainly at the lower (rehabilitation) end of the performance spectrum[5]. Broader investigation of fascia’s role in the functional interaction of motor control, energy conservation, respiratory demand and power generation, may serve to facilitate clinical rehabilitation, return-to-sports and high-performance athletic conditioning.

Combining these insights, new interpretations of myofascial force transmissions are proposed via a “Deep P-A sling” that take into account the new understanding of niche-derived high-performance gait and locomotor/respiratory phase-locking; with relevance to both running performance and injury prevention.

In conjunction, the applications of this same sling may be used to better understand power generation in sports, decoupling of gait with respiration and to provide new lines of enquiry for researchers, clinicians, biomechanists and performance conditioning coaches.

Methods

Cross-disciplinary literature search, including anthropology[3], motor control[5], orthopaedics[1], evolutionary biology[4], epidemiology, biomechanics[2], strength conditioning, combined with clinical theory and application were used to identify potential for a new myofascial sling described in Figure 1. running from various appendicular muscles.

Figure 1: The Deep P-A Sling
Results

Complex disparate concepts between research fields, unified by fascia, have been reconciled to expand on pre-established models of function and performance. The scope for application in clinical problem-solving and through experimental trials requires further investigation.

Conclusion

This interdisciplinary overview of fascial function viewing human movement through the lens of evolutionary selective pressures provides a fertile soil for clinical application, performance conditioning and future research directions.

References


