P13 - ULTRASONOGRAPHY ANALYSIS OF THE THORACOLUMBAR FASCIA SHEARING MOVEMENT IN EXTENSION-FLEXION MOVEMENT IN HEALTHY ADULTS

Pihman M.[1], Luomala T.[1], Liukkonen H.[2], Heiskanen J.[3]
[1]MT-Physio Oy, Tampere; [2]University of Turku, Information Systems Science, Turku; [3]Metropolia University of applied science, Helsinki, Finland

Introduction: The thoracolumbar fascia (TLF) has been under magnification for several decades. Also the movement of the TLF has been fascinating researchers and clinicians. Inspired by the work of Langevin et al, 2011 (1) we wanted to visualize how and which direction fascial layers move when performing a simple daily task, extending trunk. TLF has few layers the amount varies depending of author. In this study only the posterior layer of TLF (pTLF) has been evaluated.

Purpose/Aim: Purpose of this study is to measure which direction the pTLF has the biggest shearing movement in the sagittal plane movement (flex-ext) of the trunk. Movement patterns seems to be individual. Aim of this study is also to record this differences.

Materials and Methods: Subjects were 12 healthy female, without back-pain, age between 20-25 years. Setting of test was sitting position, active extension-flexion (from neutral position to maximal extension and return) movement against pulley with 10 kg resistance. Pulley was against the chest, no scapular movement allowed. Ultrasonography's probe was in the level of the L1. The probe was at first in vertical position, then 45^0, horizontal and finally 135^0. Both sides were tested on every subject. Shearing movement of each degrees was recorded to the video. Videos were analyzed and compared to each other.

Results: There were differences in pTLF shearing movements according to different angles. In 46%

of cases the biggest shearing movement occurred when the probe was inclined in 135^0. In 37% of cases the biggest movement occurred when the probe was in vertical position. In 9% of subjects most mobile angle was in 45^0 and 8% of the cases probe was pointed horizontally.

Conclusion: The first assumption could be that when sagittal movement occur also the shearing movement would be biggest in same plane. In this study findings indicates something else, only 8% of cases had biggest movement in the sagittal plane. This study promotes the idea of individual movement solutions for the same task and remind researcher and clinicians that human body is three dimensional network where movements and their dysfunctions might occur in any planes despite of performed task.

Keywords: thoracolumbar fascia, shearing movement, fascia, individual movement pattern

Reference:

1. Langevin H.M. et al, 2011. Reduced thoracolumbar fascia shear strain in human chronic low back pain. *BMC Musculoskelet Disord.* 2011 Sep 19;12:203. doi: 10.1186/1471-2474-12-203