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Abdominal muscle recruitment during a range of voluntary exercises.

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Source

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Abstract

Various exercises are used to retrain the abdominal muscles in the management of low back pain and other musculoskeletal disorders. However, few studies have directly investigated the activity of all the abdominal muscles or the recruitment of regions of the abdominal muscles during these manoeuvres. This study examined the activity of different regions of transversus abdominis (TrA), obliquus internus (OI) and externus abdominis (OE), and rectus abdominis (RA), and movement of the lumbar spine, pelvis and abdomen during inward movement of the lower abdominal wall, abdominal bracing, pelvic tilting, and inward movement of the lower and upper abdominal wall. Inward movement of the lower abdominal wall in supine produced greater activity of TrA compared to OI, OE and RA. During posterior pelvic tilting, middle OI was most active and with abdominal bracing, OE was predominantly recruited. Regions of TrA were recruited differentially and an inverse relationship between lumbopelvic motion and TrA electromyography (EMG) was found. This study indicates that inward movement of the lower abdominal wall in supine produces the most independent activity of TrA relative to the other abdominal muscles, recruitment varies between regions of TrA, and observation of abdominal and lumbopelvic motion may assist in evaluation of exercise performance.

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