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The relationship between body positioning, muscle activity, and spinal kinematics in cyclists with and without low back pain

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Cycling is an aerobic and low-impact method of exercise with inherent risks of overuse injuries in the lumbar spine. The pathomechanics and association of risk factors of lumbar spine overuse injuries in cycling are not clearly understood. Approximately 23 million people who regularly cycle, developing at least one overuse injury in their lifetime in the USA. Up to 22% of cyclists experiencing time loss from activity due to low back pain.

Several measurement techniques (EMG, MVC, VAS, RBG) are used to assess muscle activity, pain, range of motion, and bicycle design. Methodological differences between studies can impact the reliability and validity of the research findings.

The literature search identified 238 total subjects; all males ranging from ages 18 to 57, 120 to 160 lbs., and 5’3” to 6’1”. Four within-participant study designs, two case-control study designs, and one single-case study. Average Downs and Black score = 10.5 out of 27; highest score = 15 out of 27. Studies deemed to be of low to moderate quality.

Small sample sizes (only 3 studies where n > 30). Correcting for multiple comparisons: “Statistically higher magnitude change in EMG at low back muscle groups with lower back muscle injury compared with vibration-induced LBP. Conformation of regression design of this can be verified.”

Study of spine during cycling: Effects of changing the saddle angle on incidence of low back pain. Data of changing the saddle angle on incidence of low back pain.

The relationship between body positioning, muscle activity, and spinal kinematics in cyclists with and without low back pain

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METHODS


RESULTS

Seven articles eligible for review; comparative and observational studies were selected for the research question. 238 total subjects; all males ranging from ages 18 to 57, 120 to 160 lbs., and 5’3” to 6’1”. Four within-participant study designs, two case-control study designs, and one single-case study. Average Downs and Black score = 10.5 out of 27; highest score = 15 out of 27. Studies deemed to be of low to moderate quality.

The prevalence of low back pain in cyclists has yet to be elicited. The relationship between body positioning, muscle activity, and spinal kinematics in cyclists with and without low back pain.

CONCLUSIONS

Direct pathomechanics of overuse low back pain in cyclists have yet to be elicited. The relationship between body positioning, muscle activity, and spinal kinematics in cyclists with and without low back pain.

REFERENCES