

足関節捻挫の既往を有する者の前額面上の姿勢制御の特徴

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【目的】

足関節捻挫の既往を有する者における姿勢制御の変化と、膝関節や腰部の外傷障害の危険因子の一つである骨盤-体幹部の外側傾斜との関連を検証し、前額面上の姿勢制御の特徴を明らかにすることを目的とした。

【方法】

対象者は捻挫の既往歴があり、Cumberland Ankle Instability Toolが24点以下の下肢を既往あり群とした。また、足関節捻挫の既往がない下肢を既往なし群とした。測定は内側リーチ姿勢保持課題時の骨盤-体幹部の外側傾斜角度、足圧中心(95%信頼楕円面積、総軌跡長、速度、COPxおよびCOPy偏位量)と足圧分布(踵部内側、踵部外側、アーチ部、第1中足骨、第3中足骨、第5中足骨、母趾)の計測、足関節・股関節の機能評価(足関節背屈、底屈、外反筋力、股関節外転筋力、足関節背屈可動域)を実施した。これらの測定項目を既往あり群と既往なし群で群間比較を実施した。

【結果】

対象者は既往あり群10名(年齢: 22.6 ± 4.1 歳)、既往なし群9名(年齢: 21.4 ± 2.5 歳)であった。既往あり群では既往なし群と比較し、内側リーチ姿勢保持課題時の体幹外側傾斜角度が有意に大きかった(既往あり群: $12.0 \pm 6.6^\circ$ 、既往なし群: $4.9 \pm 6.1^\circ$ 、 $p=0.03$)。また、既往あり群では足圧中心の95%信頼楕円面積(既往あり群: $783.1 \pm 312.1\text{mm}^2$ 、既往なし群: $473.8 \pm 211.0\text{mm}^2$ 、 $p=0.02$)、総軌跡長(既往あり群: $570.9 \pm 193.0\text{mm}$ 、既往なし群: $368.4 \pm 110.7\text{mm}$ 、 $p=0.01$)、速度(既往あり群: $57.1 \pm 19.3\text{mm/s}$ 、既往なし群: $36.8 \pm 11.1\text{mm/s}$ 、 $p=0.01$)の数値が有意に高かった。その他の項目は有意差がなかった。

【結論】

足関節捻挫の既往を有する者は、内側リーチ姿勢保持課題にてCOPの動揺が増加し、体幹部の外側傾斜という特徴を示した。

Characteristics of frontal plane postural control in individuals with a history of ankle sprains

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[Purpose]

This study aimed to investigate the relationship between postural control changes and pelvic and trunk lateral lean, a risk factor for knee joint and lower back injuries and disorders, in individuals with a history of ankle sprains. It also aimed to clarify postural control characteristics in the frontal plane.

[Methods]

Participants with a history of ankle sprains and a Cumberland Ankle Instability Tool score of ≤ 24 were classified into the sprain group. Those with no history of ankle sprains were assigned to the healthy group. Measurements included the lateral lean angle of the pelvis and trunk during a medial reach posture-holding task, center of pressure (COP) parameters (95% confidence ellipse area, total path length, velocity, and COPx and COPy displacements), foot pressure distribution (medial and lateral heels; arch; first, third, and fifth metatarsals; and hallux), and functional assessments of the ankle and hip (ankle dorsiflexion and plantarflexion, eversion, and hip abduction strengths, and ankle dorsiflexion range of motion). These measurements were compared between the sprain and healthy groups.

[Results]

Participants included 10 and 9 individuals in the sprain (mean age: 22.6 ± 4.1 years) and healthy (mean age: 21.4 ± 2.5 years) groups, respectively. The trunk lateral lean angle during the medial reach posture-holding task was significantly greater in the sprain group than in the healthy group (healthy group: $4.9 \pm 6.1^\circ$, sprain group: $12.0 \pm 6.6^\circ$, $p = 0.03$). Additionally, the 95% confidence ellipse area of the COP (healthy group: $473.8 \pm 211.0 \text{ mm}^2$, sprain group: $783.1 \pm 312.1 \text{ mm}^2$, $p = 0.02$), total path length (healthy group: $368.4 \pm 110.7 \text{ mm}$, sprain group: $570.9 \pm 193.0 \text{ mm}$, $p = 0.01$), and velocity (healthy group: $36.8 \pm 11.1 \text{ mm/s}$, sprain group: $57.1 \pm 19.3 \text{ mm/s}$, $p = 0.01$) were significantly higher in the sprain group. No significant differences were observed for other variables.

[Conclusion]

Individuals with a history of ankle sprains showed increased COP sway and trunk lateral lean during the medial reach posture-holding task.