

コリジョンスポーツにおける至適な頸部周囲筋力と 頸椎アライメントの解明:重症頭頸部外傷を予防するために

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Analysis of Suitable Cervical Spine Alignment and Muscle Strength Around The Neck of Collision Sports Players – To Prevent The Severe Head and Neck Injuries

by

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ABSTRACT

Severe head and neck injuries occasionally occur in collision sports such as Judo or Rugby football. Degenerative changes in the cervical spine including abnormal alignment, spur formation and disc space narrowing are risk factors for severe injuries. It is also well known that neck muscle strength is one of the important factors for the prevention of severe injuries and degenerative disorders. The aim of this study future was to assess the relationship between the neck muscle strength and radiographic findings of the cervical spine among collision sports players. We hypothesized that poor

muscle strength and unbalanced neck muscle flexion/extension strength ratio maybe associated with degenerative cervical findings. 168 judo-players (22-32 years old) and 203 rugby football-players (18-30) underwent neck extension and flexion muscle strength measurement, and 55 judo-players and 58 rugby players underwent cervical radiographical examination. Cervical alignment was classified as normal, straight, kyphosis, and sigmoid according to the Borden & Reichtman method. Disc space narrowing and spur formation were also measured according to the Kondo method and the Nathan classification. Height, weight, neck flexion and extension strength, flexion/extension ratio of the judo group were higher than that of the rugby group with statistical significance. However, there were no significant difference of result/weight value (Judo: flexion;2.39N, extension;3.38N, ratio;0.71, Rugby: flexion;2.37, extension;3.41, ratio; 0.70). In Judo group, sigmoid deformity group ($420 \pm 50.2\text{N}$) showed significantly higher neck extension strength compared with normal group ($331.7 \pm 48.4\text{N}$, $p < 0.05$). At the factor of flexion/extension muscle strength ratio, straight (0.67) and kyphosis (0.63) group showed significantly lower value compared with normal group (0.78, $p < 0.05$) in Judo. In Rugby group, the presence of spur formation group (0.54) showed lesser flexion/extension muscle strength ratio compared with normal group (0.68), significantly ($p < 0.05$). Neck muscle strength is one important factor to prevent and reduce the severe neck injury or cervical spine abnormal findings. From this study, not only the value of muscle strength, but also the flexion/extension ratio provide important contribution for these findings. Lower flexion/extension neck muscle strength ratio is one of the risk factors of cervical spine issues for collision sports players.

要 旨

コリジョンスポーツ選手においては頸椎の退行変性をきたすことがあり、変性が進行すると頸髄損傷などの重大事故につながる危険性も示唆されている。頸椎退行変性とくにアライメント異常には頸部周囲筋力バランスが関与していることも報告されている。コリジョンスポーツ選手の頸椎退行変性予防さらには重症頸椎頸髄損傷予防を目的とし、頸部屈曲・伸展筋力バランスの異常が頸椎退行変性やアライメント異常に関与していると仮説のもと柔道選手及びラグビー選手の頸部周囲筋

力と頸椎レントゲンの関連を解析した。対象はメディカルチェック時に頸部周囲筋力測定を実施した柔道選手168名(22-32歳)、ラグビー選手203名(18-30歳)であり、このうち頸椎レントゲン検査を受けたのは柔道群55名、ラグビー群58名であった。身長・体重・頸部屈曲筋力・伸展筋力および屈曲/伸展筋力比とも柔道群が有意に大きかったが、体重比は両群間に有意差はなかった。頸椎アライメントにおいては正常群と前弯消失群、後弯変形群の筋力測定値に関連は認めなかったが柔道群においてS状変形群の伸展筋力が有意に大きかった(正常群: $331.7 \pm 48.4\text{N}$, S状変形群:

420±50.2 N .p<0.05). 屈曲/伸展筋力比では柔道群の前弯消失群 (0.67), 後弯変形群 (0.63), およびラグビー群の椎間腔狭小化有り群 (0.54) において正常群 (柔道:0.78, ラグビー : 0.68) と比較し有意に低下していた (p<0.05). 屈曲/伸展筋力比ひいては相対的な屈曲筋力の低下が柔道におけるアライメント異常およびラグビーにおける椎間腔狭小化に関与している可能性が示唆された.