調査研究報告書

大学生男子運動選手の姿勢と腰痛の関連

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【要約】

本研究は腰痛を持つ運動選手の姿勢について、その傾向を知ることを目的とした。大学生男子運動選手200人を対象者とし、腰痛群と非腰痛群の2群に分け、それぞれの姿勢の違いについて比較・検討を行った。姿勢については、マルチン式計測法から抜粋した人体計測値と、写真撮影による左右肩傾斜角、背部上面角度、胸部上面角度を用いて検索をした。対象者の平均年齢は20.7±1.4歳、経験したスポーツの平均競技年数（複数回答）は、5.9±3.8年であった。

計測の結果であるが、腰痛群に関しては、非腰痛群と比較して上半身のいくつかの計測値が有意に大きかった。さらに、腰痛群は非腰痛群と比較して背筋力が有意に弱いことが認められた。

過去の研究で、脂肪が腹部に過剰につくと、腰部の前湾が増す（加藤,1994）といわれている。しかし今研究においては、腹部の各周径値と腰痛群との間に有意な関連は認められなかった。

腰痛群と非腰痛群の2群間（以下は、単に2群間とする）の各計測値に関して、腰痛群の値が有意に大きかった計測値は、背幅、W.L（ウエストライン）→H.L（ヒップライン）、腕付け根前後径、頸付け根囲、背部皮脂厚、背筋力、背幅／総丈、背幅／右肩先の高さ、の9変数であった。腰痛群と非腰痛群のそれぞれの計測値間の相関係数を求めた結果、8項目において2群間の相関係数に特に「大きな」差が認められた。それは以下の通りである。

<u>非腰痛群に高い相関が認められて腰痛群に相関の見られない項目</u>

（A）「肩傾斜角右」と「H右肩先」（非腰痛群：r＝-0.5158）

（B）「乳頭位胸囲」と「背筋力」（非腰痛群：r＝0.4903）

（C）「H右肩先の高さ」と「H腕付け根の高さ」（非腰痛群：r＝0.7989）

（D）「右膝囲」と「下腿最大位高」（非腰痛群：r＝0.4747）

<u>腰痛群に高い相関が認められて非腰痛群に相関の見られない項目</u>

（E）「頸付け根囲／右肩先の高さ」と「下胴囲／腕付け根の深さ」（腰痛群：r＝0.5302）

（F）「乳頭位胸囲／右肩先の高さ」と「H右肩先の高さ」（腰痛群：r＝-0.7017）

（G）「中胴囲／右肩先の高さ」と「H右肩先の高さ」（腰痛群：r＝-0.7038）

（H）「下胴囲／右肩先の高さ」と「H右肩先の高さ」（腰痛群：r＝-0.6934）

これらの結果から、以下のことが推測される。1）非腰痛群は肩の傾斜によって肩先の高さが決定される、2）非腰痛群の身体の周径値、特に胸囲は筋肉に依存している、3）腰痛群は体幹部の周径値が相対的な肩の高さに影響を及ぼす。前後のどちらかに体幹部が傾斜していることによって肩の位置が低くなることが予想できる。今後は、これら腰痛群の姿勢の特徴を検証し、さらに女子運動選手にも研究対象の幅を広げる必要がある。

【SUMMARY】

We studied the relationship between back pain and posture among 200 male university-athletes. The mean age of the sample was 20.7±1.4. The mean length of any sports they had experienced was 5.9±3.8 years (answers given for a multiple of sports).

We tested twelve hypotheses among which only two were supported: (2) The group with back pain had a bigger 'upper part of body', compared to the group without back pain. (5) The group with back pain had stronger or weaker 'muscular strength of the back' than the group without back pain, due to the imbalance between 'abdominal muscle' and 'back muscle'.

The hypotheses that were not supported were listed below:

(1) The group with back pain had a bigger 'head' than the group without back pain.

(3) The group with back pain had a longer 'length between cervical vertebrae and low-torso circumference' and a bigger 'motion of the torso' than the group without back pain, resulting in suffering from back pain.

(4) The group with back pain had a bigger 'circumference of low- and middle-torso' than the group without back pain.

(6) The group with back pain had a bigger or smaller 'side posture angle' than the group without back pain, due to the posture which might put stress on the lower back.

(7) The group with back pain had a bigger or smaller 'front posture angle' than the group without back pain, due to the posture which might put stress on the lower back.

(8) The group with back pain had a bigger 'top side angle of the back' than the group without back pain, due to the posture which might put stress on the lower back.

(9) The group with back pain had a bigger 'top side angle of the chest' than the group without back pain, due to the posture which might put stress on the lower back.

(10) The group with back pain had a lower value for 'their standing anteflexion' than the group without back pain, due to their lower flexibility.

(11) The bigger 'the degree of pain' was, the bigger or smaller 'the posture angle' was.

(12) The bigger 'the posture angle' was, the bigger 'the top side angle of the chest/back'. The smaller 'the posture angle' was, the smaller 'the top side angle of the chest/back'.

Kato (1994) said that if there is too much body fat in the abdomen, the arch of low back and the degree of low back pain are increased. However, my hypothesis (4) was not supported. The younger age of sample in my study might explain this discrepancy.

The group with back pain had bigger values in the following nine variables: 'back width', 'length of waist line →hip line', 'sagittal length of the base of the arm', 'circumference of the base of the cervix', 'sebum thickness of the back', 'muscle strength of the back', 'back width divided by the length of cervical vertebrae', and 'back width divided by height of the right shoulder'.

Characteristics of the two groups are described below, by evaluating pairs (between the two groups) of correlation coefficients of any measured variables. The following eight pairs of variables, which showed "great" differences of correlation coefficients between the two groups,.are described below:

(A) The group without back pain: the bigger 'the angle of inclination of the right shoulder' was, the lower 'the height of the right shoulder divided by the height' was. (r=-0.52)

(B) The group without back pain: the bigger 'the chest circumference at nipples' was, the stronger 'the muscle strength of back' was. (r=0.49)

(C) The group without back pain: the bigger 'the height of the right shoulder divided by height' was, the bigger 'the height of the base of arm divided by height' was. (r=0.80)

(D) The group without back pain: the bigger 'the circumference of right knee' was, the higher 'the height of the largest circumference point of crural' was. (r=0.47)

(E) The group with back pain: the bigger 'the circumference of the base of cervix divided by height of the right shoulder' was, the bigger 'the circumference of lower torso divided by the depth of base of the arm' was. (r=0.53)

(F) The group with back pain: the smaller 'the chest circumference at nipples divided by height of the right shoulder' was, the bigger 'the height of the right shoulder divided by height' was. (r=-0.70)

(G) The group with back pain: the smaller 'the circumference of middle torso divided by height of the right shoulder' was, the bigger 'the height of the right shoulder divided by height' was. (r=-0.70)

(H) The group with back pain: the smaller 'the circumference of lower torso divided by height of the right shoulder' was, the bigger 'the height of the right shoulder divided by height' was. (r=-0.69)

It can be said, from the above eight points, that the group with back pain showed relatively imbalanced posture, which correlated with imbalanced strength of muscles. If university-athletes engaged in any muscle training which neglected well-balanced posture, the training itself might eventually cause back pain. Further tests and verification of these findings were needed and a more extended sample (e.g. female university-athletes) should participate in the next study.