

FINAL REPORT - abstract

Project Title	Development of the shoulder joint screening test criteria to prevent shoulder pain in Japanese Badminton Players.
Researcher	Yuki Warashina
University/Institution	Tokyo Keizai University
Contact	wara@tku.ac.jp

Purpose

This study aims to identify shoulder joint flexibility screening test criteria for preventing and coping with/without shoulder pain in badminton players.

Introduction

Shoulder pain is an important issue for all badminton players regardless of age or gender. However, there are few sports medicine studies on the actual condition and direct key risk factors of shoulder pain in badminton players, and no specific countermeasures or preventive measures for shoulder pain have been established. Furthermore, few have reported on changes in range of motion of the shoulder joint and muscle tightness items in badminton players. Therefore, the effect and relationship in the shoulder pain and the range of motion in the shoulder joint have not been clarified.

The main research question in this study is that “Where the cut-off value would be in the shoulder joint flexibility of badminton players with shoulder pain?”. Establishing the shoulder joint flexibility cut-off value would be useful to detect and prevent further severe injuries for badminton players.

Methods

Subjects for this study are 20 Japanese badminton players in junior high school.

In the shoulder joint medical screening, the following three items will be investigated and measured.

1. Questionnaire: Age, Gender, Competition history, History of shoulder pain, Current shoulder pain on the dominant arm, and Interference with play
2. Shoulder joint range of motion (all bilateral): Flexion, Extension, Abduction, 1st position external rotation, 90-degree abduction of the shoulder joint (2nd position) internal and external rotation, 90-degree flexion of the shoulder joint (3rd position) internal and external rotation
3. Shoulder muscle tightness (all bilateral): Combined Abduction Test (CAT), Horizontal Flexion Test (HFT)

Results

Six players (30%) had current pain. In the painful group, 6 (100%) had a history of pain, and in the pain-free group, 6 (42.9%) had a history of pain. Among the painful group, 4 (66.7%) answered that they had difficulty in playing.

A significant difference was observed in the difference of range of motion of 2nd internal rotation between the two groups: -13.3 ± 17.2 degrees in the painful group and 0.7 ± 7.6 degrees in the painless group ($p < 0.05$, ES: $d = 1.26$ -Large, $1 - \beta = 66.3\%$). There was no significant difference in the other items.

The items with an effect size of Medium ($0.5 \leq$) or more were: left-right difference in extension range of motion, left-right difference in 2nd total range of motion, left-right difference in 3rd external rotation range of motion, left-right difference in CAT, right-right difference in CAT, right-right difference in HFT, and left-right difference in HFT.

The ROC analysis showed that the items with significant cut-off values were right 30 degrees of 3rd internal rotation ($p < 0.05$, $AUC = 0.83$), right 145 degrees of 3rd total range of motion ($p < 0.05$, $AUC = 0.79$).

Discussion

This study once again reveals that many badminton players have a history of shoulder pain. It is assumed that there are many people with pain who have trouble playing, and it will be shown that shoulder pain is an important problem that must be prevented by badminton players when playing and continuously playing badminton.

In addition, differences in range of motion and flexibility screening tests between those with current pain and those without pain are evident, and their relationship to shoulder pain can be clarified. It is suggested that these items could be adopted as medical screening items specific to badminton by accumulating data by age and competition level and further examining them in the future, and that they could become important indicators for the construction of specific measures to prevent shoulder joint pain in badminton players.

Specifically, it serves as a criterion for "how much shoulder joint flexibility should be ensured in warming-up and cooling-down".

This study will be a recommendation that can be given back to everyone who plays badminton. For anyone associated with any form of badminton, this could be an important finding for preventing poor performance and enjoying badminton more safely and for longer.

Conclusion

(1) Sixty percent of the participants had shoulder pain in the past, and 67% of the participants with pain had difficulty in playing.

(2) There were more players with a history of pain in the painful group than in the pain-free group, and the difference between the right and left sides of the 2nd internal rotation range of motion was lower.

(3) The range of motion of 2nd and 3rd position rotation, CAT, and HFT were associated with a history of shoulder pain, indicating the possibility of adopting these items as specific medical screening items in badminton competitions.

References

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