Surveillance of Musculoskeletal Symptoms and Anthropometric Variables among Four International Cricket Teams Competed in ACC Premier League Malaysia 2014

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Abstract

Background and Purpose: Chronic musculoskeletal injuries are more common in cricket players. Acute problems may be due to trauma or injuries during sporting. The musculoskeletal system includes muscles, joints, bones, cartilage, ligaments, fascia, nerves and other associated soft tissues. Whatever the mode of injury, it causes pain, movement restriction, muscle weakness, and ultimately loss of functions. The current study focused on identifying the most common site involved in musculoskeletal problems and to explore possible variations in anthropometric characteristics. Methodology: This study was conducted in Kuala Lumpur, Malaysia where Asian Cricket Council Premier League 2014 was conducted. Permission to approach the players was taken from the council members and all the players were assured that the information collected from them will be kept confidential and all were explained about the objective study. Modified Nordic musculoskeletal questionnaire was distributed to the players and instructions were given about how to fill the questionnaire. Their anthropometric characteristics, experience and time of training sessions were collected by a blinded assessor. Results: Player’s height (p = 0.003), weight (p = 0.050), experience (p = 0.001) and practicing hours per week (0.002) were analyzed. There is a statistically significant difference in these characteristics was observed. Occurrence of acute troubles (within 7 days) of upper back and elbow region were found different in four teams with a P value of 0.007 and 0.022 respectively. Persistence of neck, shoulder and lower back troubles in the last one year has a significant difference between the groups with a P value of 0.014, 0.003 and 0.021 respectively. Conclusion: This study can conclude that the prevalence of musculoskeletal injuries is more in cricket. Especially shoulder, neck, lower limbs and lower back. The incidence of acute problems is more in elbow and upper back regions. This may be acute injuries but not due to chronic over use. The anthropometric variations between groups participated in ACC premier league, Malaysia 2014 was also significantly differing from each other.

Keywords: Anthropometric Variations, Cricket Injuries, Musculoskeletal Injuries, Risk Factors for Cricket Injuries

1. Introduction

Cricket is the second most popular sport worldwide1-2. There are several studies which explain the injuries of soft tissues like muscles, joints, tendons and ligaments. The risk of getting injured is more during fast bowling, fielding, and batting. The involvement of lower limbs (22.8% to 50.0%)3-5 is more when compared to upper limbs and back. Some studies on young fast bowlers reviled that acute lower limb soft tissues injuries are occurring while participating in matches and practices during the early part of the season4. The reasons for acute injuries in young cricket players were explained as the demands on the musculoskeletal system, incorrect technique, poor preparation and training, overuse, and environment. These studies were concentrated on ocular
injuries, splenic rupture and other acute multi system injuries ⁷,⁸ but not on musculoskeletal problems.

The influence of extrinsic factors will be strengthened when the intrinsic factors are at a disadvantage. So the influences of intrinsic factors in sports need to be studied biomechanically ⁹. Various anthropometric characteristics and positioning of body parts in relation to other during sport activity are more considered as intrinsic factors. Predicting the sports performance with anthropometric variables is common and the available evidence for existence of correlation between these two is not strong. The physique plays important role in sports. Proportions of body parts and Morphological constitutions in the human body are genetically determined factors. These cannot be changed under normal circumstances. Even though physical fitness is trainable factor, the influence of physique and body compositions is genetically predisposed. Anthropometric characteristics will be considered as an important factor when dealing with high levels of physical performance ¹⁰. Studies have also shown that champions of different sports require different body proportions with respect to their events ¹¹-¹³. We can frame standardized physical characteristics as one of the selecting criterion for different sports, if the influence of physique on each sport performance is clearly studied.

2. Methodology

This study was conducted in Kuala Lumpur, Malaysia where Asian Cricket Council Premier League 2014 was conducted. Permission to approach the players was taken from the council members. A total of 5 teams were identified in the competition and only four teams were willing to participate in this study. All the players were assured that the information collected from them will be kept confidential and all were explained about the objective study. Modified Nordic musculoskeletal questionnaire was distributed to the players and instructions were given about how to fill the questionnaire. Their anthropometric characteristics, experience and time of training sessions were collected by a blinded assessor. ANOVA was used to analyze the differences in anthropometric variables and musculoskeletal complaints among four different cricket teams.

3. Results

Muscloskeletal problems in all four groups were analyzed and the results were summarized in a pie diagrams. In the last one year Players experienced more problems in shoulder region and back region. Non specific back problems are occupying a larger area in the pie diagram. But when upper back and lower back were analyzed separately both are in same proportion. Problems in ankle region are in the third place (Figure 1).

Most of the players reported that they have prevented from work due to shoulder problems in the last one year. Lower back, upper back and ankle problems are in the next three places which prevented the players from work. Few of the players reported troubles in knee and wrist area. Nobody have prevented from working due to troubles in neck, elbow and hip regions (Figure 2).

The problems experienced in the last seven days (7 days before the data was collected) are analyzed and the results are indicating that the problems which prevented in the last 12 months are responsible to cause troubles in the week before the commencement of actual competition. Shoulder and upper back problems occupied first two places. Lower back is in the third place and ankle is the fourth region in which cricket players experienced problem in last seven days (Figure 3).

![Figure 1. Musculoskeletal problems at various parts of body in the last 12 months.](image1)

![Figure 2. Musculoskeletal problems which preventing from doing work in the last 12 month.](image2)
Various anthropometric variables, practicing hours and experience were statistically analyzed by using the software S.P.S.S - version 20. One way ANOVA was used to find out the between group differences in anthropometric characteristics and experience of players in four groups. Player’s height, weight, experience and practicing hours per week were analyzed. There is a statistically significant difference in these characteristics was observed (Table 1).

The occurrence of various musculoskeletal troubles in each team was analyzed by using descriptive statistics and the difference in the occurrence of musculoskeletal troubles between four groups was measured by using Chi-Square Test. The prevalence of hip, knee, ankle and wrist troubles is same in all the groups. Differences in the prevalence of wrist problems in the last 7 days were not able to compute due to the constant absent of this problem in all players.

Persistence of neck, shoulder and lower back troubles in the last one year has a significant difference between the groups with a P value of 0.014, 0.003 and 0.021 respectively. The percentage of players with neck pain is more in Hong Kong (58.3%) cricket team, shoulder pain is more in Nepal cricket team (71.4%) and Malaysian cricket team is facing more trouble in lower back (20%), no team is prevented by musculoskeletal problems except Malaysian team with 20% of players facing upper back troubles and there is a difference between four teams (P = 0.047) in upper back troubles which prevented from work in the last one year.

Occurrence of acute troubles (within 7 days) of upper back and elbow region were found different in four teams with a P value of 0.007 and 0.022 respectively. 30 % of Malaysian team is reported upper back pain within last 7 days. 25% of Hon Kong team is also having acute problems in elbow region. In general omen cricket team is not reported considerable musculoskeletal troubles.

4. Discussion

The results of this study clearly expressing the variations in anthropometric characteristics among four cricket teams and their musculoskeletal problems. All the teams are suffering from shoulder problems in common. Upper back and lower back troubles are also commonly reported in cricket players. There are statistically significant differences between all groups in respect to their anthropometric characteristics. Hon Kong, Nepal
and Malaysia teams are facing problems frequently in
different body parts. Oman cricket team is not reported
any considerable troubles in any of the body parts.

Anthropometric variations will also play a considerable
role in the sports performance. The anthropometric profiles
included the measurement of height, weight, skin folds,
and segment lengths, breadths, and girths. The relationship
between physics and biology may influence the sports
performance in relation to the height –based factors in
sports. Both below average and above average heights are
advantageous in different kinds of sports. Faster reaction
times, acceleration, greater endurance, faster rotational
capability, agility, greater balance and lower centre of
gravity, less heat exhaustion are the advantages of below
average height. Greater absolute strength, maximum work
capacity, greater power, lower resting metabolic rate and
speed are the advantages of above average height.14

In cricket, some of the great batsmen are below average
height. This may be because a smaller body makes for an
advantage in footwork and balance. Similarly, the most
graceful wicket-keepers have tended to be average height
or below. On the other hand, many of the most successful
fast bowlers have been well above average height. Height
is not generally seen as an important attribute in rugby
league football, often with extreme height being a
hindrance rather than useful15. Analysis of differences
between experienced players and starters in cricket
revealed that talent identification is based on height,
running speed, and agility16. Max Stuelcken, David Pyne &
Peter Sinclair studied the Anthropometric characteristics
of elite cricket fast bowlers where male players showed
significant association of heights with performance. The
female bowlers had a higher sum of skin fold thickness,
were more endomorphic and less mesomorphic than
the male bowlers.17. There are studies which confirm the
relationship between variations in upper limb bones
orientation, body mass, strength of upper body and
bowling speed variations in cricketers18,19.

In a study, conducted by M H Noorbhai, 80% of cricket
players experienced musculoskeletal pain. The prevalence
of problems is more in lower and upper extremities.
The lower back occupied third place. Direct trauma is
the important predisposing factor for musculoskeletal
problems in cricketers, over use is in the next place.
The prevalence of cricket-related musculoskeletal pain
specific to the various anatomical sites were mostly knee
(30%) and lower back (29%), followed by shoulder (17%),
ankle (13%) and thigh (11%).20

In any sport activity Maturation was a significant
covariate in anthropometric measures but not in physical
performance. Experience and practice are the key factors
for improving performance. Few authors were not able
to draw a possible relationship between anthropometric
variables and sports performance in cricket21. Greater
the practicing hours greater the skill achieved. Too much
practice may lead to overuse injuries, so work load can be
considered as a risk factor for sports related injuries22-25.
It is accepted fact that there are several risk factors for
sports injuries. But the thing is to identify the possible
relationship between these risk factors and injuries. It
is not fare to discuss the sports injuries in relation to
intrinsic factors but extrinsic factors should also be
considered. Orchard J W et.al; concluded that meaningful
comparison of injury surveillance data from different
countries and time periods, would assist in the possible
identification of risk factors for injury in cricket.26

The results of this study can give a picture of
musculoskeletal injuries in cricket players and their
anthropometric variations. The major limitation of this
study is its failure to draw a relationship between these
anthropometric variables and prevalence of sports
injuries. To achieve this objective the study should
consider possible risk factors in cricket, both intrinsic
and extrinsic. It will be difficult to study each risk factor
in isolation because the sports injuries are the result of
cumulative effect of various factors. Future work on
physique and sports performance can help us to form
selecting guidelines for different sports depending on
their physical characteristics.

5. Conclusion

This study can conclude that the prevalence of
musculoskeletal injuries is more in cricket. Especially
shoulder, neck, lower limbs and lower back. The incidence
of acute problems is more in elbow and upper back
regions. This may be acute injuries but not due to chronic
over use. The anthropometric variations between groups
participated in ACC premier league, Malaysia 2014 was
also significantly differing from each other.

6. References

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