

2nd International Conference on

Sports Medicine and Fitness

April 18-20, 2016 Dubai, UAE

A comparative and quantitative electromyographic analysis of shoulder and wrist muscles in cricket fast bowlers during bouncer and yorker delivery

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Introduction: Cricket is one of the most popular sports, played in many countries worldwide. The T20 is the shortest format of game that makes it more fascinating. However due to aggressive in nature it could be more prone for risk of injuries to shoulder and wrist in fast bowlers. Thus the purpose of the study was to determine the EMG activity and associated risk of shoulder and wrist injuries in fast bowlers while bowling 'Bouncer' and 'Yorker' deliveries.

Method: A total of 17 healthy participants including 15 right-handed and 2 left-handed fast-medium bowlers were recruited who volunteered into study under the convenience sampling method. The demographics of the bowlers are as follows: n=15, age=27.3±5.2 years, height=173.1±6.8 cm and weight=75.1±7.8 kg. The cross-sectional, experimental design of the study took place in the Robert Gordon University Laboratory, Scotland. A colored high speed camera (EXILM CASIO-EX-FH 25) was used to capture the bowling motion synchronized with EMG device (model- m 320RX, 5VDC/1A/5W, myon AG Switzerland) for data collection and analysis. Seven tested muscles were biceps brachii, middle deltoid, supraspinatus, infraspinatus, latissimus dorsi, flexor carpi radialis, extensor carpi radialis brevis. SENIAM guidelines were followed to apply the AgCl EMG electrodes.

Result: A significant difference in RMS was found in shoulder and wrist muscles while bowling bouncer and Yorker in first and second phase with p-value of 0.0 and 0.05 respectively. Friedman's test was used to yield the following result. In comparison to individual muscles Biceps brachii has the maximum electrical activity of all shoulder and wrist muscles whereas Supraspinatus showed significantly less activity in second and third phase for Yorker deliveries. The eccentric activity in external rotators of the shoulder was less compared to higher concentric activity in internal rotators while bowling bouncers in the ball release and deceleration phase whereas similar finding was seen at wrist in bowling Yorkers.

Discussion: Based on the inferential statistics, cricket bowlers are highly exposed to risk of shoulder and wrist injuries with introduction of T20I and high demand of these bowling styles. The findings of the study are novel and would hold strong significance in the area of cricket and similar sports activities. Kinematic and kinetic analysis should be used to strengthen the study with greater attention and techniques by coaching and training standards.

Biography

Animesh Hazari has completed his MPT in Sports and Clinical Biomechanics from Robert Gordon University, Scotland UK and Manipal University, India. Currently he is pursuing PhD as a full time research scholar.

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