

# EMG Analysis of Peak Muscle Activity of the Dominant and Non-dominant External Oblique during Fast Bowling: A Pilot Study

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## ABSTRACT

**Introduction:** Fast bowling is a biomechanically complex action that begins with a run-up to generate linear momentum, which is subsequently converted into angular momentum and transferred through the trunk and upper limbs during ball delivery. The abdominal musculature plays a crucial role in providing trunk stability, facilitating efficient energy transfer from the lower limbs to the upper body, and protecting the lumbar spine from repetitive high-force stresses associated with fast bowling.

**Aim:** The purpose of this study was to identify the pattern of external oblique muscle activation in collegiate fast bowlers.

**Materials and Methods:** This cross-sectional pilot study was conducted at ABSMARI and included 12 collegiate male athletes aged between 19 and 25 years. Participants were instructed to perform fast bowling in an indoor net to assess external oblique

muscle activity. Surface electromyography (EMG) electrodes were placed over the external oblique muscles, and peak muscle activity was recorded for both the dominant and non-dominant sides.

**Results:** The participants had a mean age of  $23.75 \pm 2.13$  years, a mean height of  $171.92 \pm 9.78$  cm, and a mean body weight of  $63.92 \pm 7.86$  kg. The mean peak muscle activity of the dominant external oblique was  $1072.00 \pm 376.68$ , while that of the non-dominant external oblique was  $1330.17 \pm 382.28$ . One-sample t-test analysis demonstrated that peak muscle activity on both sides was statistically significant ( $p=0.001$ ,  $df=11$ ), with higher activity observed on the non-dominant side.

**Conclusion:** The study demonstrated significantly greater external oblique muscle activity on the non-dominant side during fast bowling.

**Keywords:** Cross-sectional study, Electromyography, Energy transfer.

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