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Poster Session - Abstract

Preliminary high frequency 2D kinematic analysis of "touche" and "touche after dodge" on elite paralympic fencers

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Abstract

The purpose of this preliminary study was to compare the maximal velocity of two fencing movements currently used by elite Paralympic fencers. Three elite fencers in wheelchair selected on the national team voluntary participated to this study. Each subject was asked to performe three "touches" and three "touches after dodges". The "touche" is assimilated to a pointing task toward a normalized target. A high speed camera (casio exilim EXFH25, 240fps) recorded a sagittal view of the fencer's motions. Five anatomic markers were identified on the fencer (forward hip, shoulder, elbow, wrist and finger). DLT2D algorithm was used to calculate the markers trajectories in space. Space mean reconstruction accuracy was 4.7 mm. The marker's positions associated with Dempster's anthropometric data (1959) were used to compute the velocity of the centre of mass of the segments trunk, arm, forearm and hand. A Butterworth II filter was used with 13 Hz cut-off frequency. Wilcoxon signed rank test was used to compare the centre of mass maximal velocity of each segment between the two movements performed by the fencers. The results showed no significant difference between the centre of mass maximal velocity of each segment for the two movements ($p = 0.25$). In line with Latash's concept on the effects of the uncontrolled manifold hypothesis, it is suggested that the fencers selected subtasks in complex movement in the aim to maintain maximal velocity constant at the "touche".

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Keywords: Fencing; wheelchair; kinematics; velocity; motor control

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