OBSERVATIONAL ANALYSIS OF BODY POSITION WHILE KITESURFING

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Kitesurfing is one of the more recently popular sports where the practitioner travels on a board over the water surface, attached to a kite via a harness around the waist or hip. No or very few studies are made describing the biomechanics of kitesurfing, which is of great interest for development of the sport for performance and increased safety. The practitioner of kitesurfing has a mainly static body position (Vercryussen et al, 2009), but minor changes occur due to change of tension force in the harness. The bar, held by the arms, is used for sheeting and steering the kite. The aim of this study was to describe the body position for kitesurfing while moving upwind and preparing for jump or tricks (take-off).

Body position for kitesurfing was observed through video analysis with use of Dartfish software of four male kitesurfers kiting on flat to choppy water with a 12m² Cabrinha SB3. The movements observed were divided into the two categories; moving upwind and take-off. The mean wind speed during the trials was 13.9 knots (10.9-16.1) and for one person also the tension force from the kite was measured simultaneously (average wind speed 15.9 knots) using a load cell device. All persons used waist harnesses which were positioned with the lower end close to L₅-S₁, and supporting at least the lumbar region of the back.

The foremost body position of the observed kitesurfers was a position leaning back towards the water surface with an angle averaging 38.5° (SD±7.5°) of the lower extremities towards a horizontal plane and the upper body ca 66° (SD±6.9°) towards the horizontal plane while going upwind. While preparing for take-off the angles were ca 20° (lower extremities to horizontal plane) respective 70° (upper body to horizontal plane). Hip flexion (angle between upper and lower body) was decreased for all subjects while preparing take-off. The upper body was forward rotated while transporting, especially going upwind, hence the front knee joint was extended whereas the rear knee joint was flexed (see Fig. 1). Shoulders, especially the rear shoulder, were protracted most of the riding time, due to flexion of the arm for holding the bar with at least one arm. The force from the kite to the harness was averaging 5.1 N/kg during 18 minutes of kitesurfing and the maximum value was 13.4 N/kg.

The body position during kitesurfing is changing depending on many factors such as wind speed, upwind projection and when preparing for take-off. This influences the biomechanics and will determine how well the person can handle and utilize the force from the kite for doing tricks or moving at a certain speed. Further studies need to be made for a more in-depth description of the biomechanics and the best possible position for performance and avoiding injuries.