THE MEASUREMENT OF KNEE JOINT POSITION SENSE

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Abstract

It is commonly stated proprioception or the perception of one's own limb position, movement and effort is reduced following an anterior cruciate ligament (ACL) injury. Therefore, this thesis begins with an analysis of all current literature on this topic in the form of a meta-analysis. It became clear that the methods used to measure knee proprioception were very inconsistent and did not appear to provide normative levels of knee proprioception making it very difficult to syntheses results. This led to the thesis main objectives. The first study provided a reliable and valid method of knee joint position sense (JPS), the static component of proprioception, based on previous JPS protocols. This method was then used in the remaining studies to consider normative values of a UK population, the effect of ACL injury in both non-athletic and elite athletic populations, the effect of knee injuries (not including ligament damage) and the effect of fatigue on knee JPS. The most appropriate clinical method of measuring knee JPS using image capture as covered in this thesis was in a sitting position, from full extension in to 60-90 degrees of flexion and from 90 degrees of flexion in to 30-60 degrees of extension. Age, mass, height, BMI, activity level, knee condition (other than ligament injury) or fatigue did not appear to significantly affect knee JPS in an uninjured population. However, both non-athletic and elite athletic populations with previous ACL injury demonstrated significantly worse knee JPS when compared to controls. In conclusion, it would appear the only knee condition that reduces joint position sense ability is ACL injury. Although, it may also be possible the method is not sensitive enough to measure subtle changes in JPS in other populations due to large measurement error values. In the future it may not be necessary to place importance on knee joint position sense as it either may not be impacted by any injury other than ACL damage, or the methods used to collect JPS are not sufficient in measuring changes during rehabilitation. Additionally, it is important researchers consider the relationship between knee JPS and functional movements.