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A QUALITATIVE SCORING SYSTEM OF UNILATERAL LOADING, ASSESSMENT OF MOVEMENT QUALITY IN YOUTH MULTISPORT ATHLETES DURING GROWTH

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10.1136/bjsports-2021-IOC.290

Background Movement quality has been identified as an important physical quality within the youth athlete. However, evidence around effects of growth/maturation on movement quality as a risk factor for injury is limited. 3D measures are considered international standard, they are not always practical within the youth environment, feasible field-based alternative methods are required.

Objective To establish validity and reliability of Qualitative Assessment of Single Leg Loading (QASLS) tool in adolescent multisport athletes at different stages of growth

Design Test-Retest Cross Sectional Study.

Setting Field based setting within athlete academy.

Participants 35 (20 male, 15 female) multisport athletes participated in this study.

Interventions 2 unilateral loading tasks were analysed – single leg squat and single leg land – participants were assessed every month for 8-month period performances were evaluated based on their maturational status as determined via peak height velocity (PHV).

Main Outcome Measurements 2D Kinematic Parameters – Trunk Lean (Frontal and Sagittal), Hip Adduction Angle, Frontal Plane Projection Angle (FPPA) and Qualitative QASLS Score of movement quality.

Results Results suggest that QASLS and 2D parameters maybe reliability assessed in youth multisport athletes. Within subject compound scoring variation is high. Pre and circa PHV athletes demonstrated greatest variation in movement strategies with highest scores and numbers of strategies used and post PHV the least.

Conclusions This study highlights greater use of increased movement strategies during growth and thus increased prevalence of potential risk factors in younger and athletes encountering the growth spurt. This may have injury, monitoring and return to play implications.

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EFFECT OF MATURATION ON KNEE EXTENSOR AND FLEXOR STRENGTH IN MALE AND FEMALE ADOLESCENT ATHLETES

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10.1136/bjsports-2021-IOC.291

Background Knee extensor and flexor strength are associated with injury risk, including rupture of the anterior cruciate ligament. However, the longitudinal changes in lower extremity strength with maturation have been under-investigated.

Objective To investigate the longitudinal changes of knee extension and flexion strength associated with maturation

Design The pubertal status [pre-pubertal, pubertal, and post-pubertal] was determined with the modified Pubertal

Maturation Observation Scale questionnaire. After a warm-up of five submaximal repetitions, participants were tested for concentric peak isokinetic strength for knee extension and flexion at 300°/s.

Setting Laboratory.

Patients (or Participants) Males and females participating in high school sports who were measured longitudinally in at least two different pubertal stages (N=257, 208 females, 18 excluded due to knee injury).

Interventions (or Assessment of Risk Factors) N/A

Main Outcome Measurements Peak knee extension and flexion isokinetic torque was measured across 10 repetitions and normalized to body weight. Separate linear mixed models were used for the right and left side to test for the effect of pubertal stage, sex and their interaction.

Results Significant interactions were identified indicating a different maturational effect on knee muscle strength for males and females, particularly between pre-pubertal and pubertal stages where males demonstrated higher knee extension increases than females (+12% vs. +5% on right, +11% vs. +7% on left, p<0.001) while for knee flexion males demonstrated increased while females demonstrated decreased flexor strength (+4% vs. -1% on right, p=0.03 and +3 vs. -3% on left, p=0.009).

Conclusions The findings of this study support a differential effect of maturation on important knee strength outcomes that may have implications for the higher rates of knee injury in females as they mature. Interventions to strengthen the knee flexors should target females at the beginning of puberty and emphasized in injury reduction programs aimed at young athletes of both sexes.

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KNEE AND ANKLE OVERUSE INJURIES IN YOUTH BASKETBALL PLAYERS

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10.1136/bjsports-2021-IOC.292

Background Current scientific evidence reveals that overuse injuries may be more prevalent in youth basketball players than previously reported. Many basketball injuries result from gradual onset overuse mechanisms associated with pain, but not resulting in absence from basketball participation.

Objective To determine the season prevalence and burden of all complaint overuse knee injuries (OKIs) and ankle injuries (OAI) in youth basketball players.

Design Cohort study.

Setting Youth basketball, Calgary, Canada.

Patients (or Participants) A convenience sample of 83 (47F, 36M; Ages 16–18; N=7) senior team high school basketball players.