

**371** CHANGES IN CYCLING KINEMATICS IN FUNCTION OF EXERCISE INTENSITY AND ASSOCIATION WITH INJURY PREVALENCE IN AMATEUR ROAD CYCLISTS: A 3D KINEMATIC MOTION ANALYSIS STUDY USING STATISTICAL PARAMETRIC MAPPING

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**Background** Road cycling is one of the most popular endurance sports worldwide. Due to its cyclic character, the prolonged flexion posture and significant training volumes, it is associated with a high overuse injury prevalence. To prevent these injuries, control of cycling posture is thought to be imperative. To what extent cycling posture relates with susceptibility to injury, has not been investigated so far.

**Objective** This study wanted to assess how cycling posture and kinematics vary in function of exercise intensity, and how this relates to the prevalence of overuse injuries.

**Design** Cross-sectional observational study (three-dimensional (3D) kinematic analysis).

**Setting** Comprehensive kinematic analysis of trunk and lower limb during cycling task of increasing intensity.

**Patients (or Participants)** 67 recreational road cyclists.

**Interventions (or Assessment of Risk Factors)** Participants were submitted to an exertional cycling protocol, using their own race bike on a stationary ergometer system. Throughout the test, 3D kinematic data of lower limb and trunk were captured at constant time-intervals. Afterwards, data on power, heart rate, power-related kinematic changes and the presence of cycling-specific complaints were submitted to statistical analysis.

**Main Outcome Measurements** Power-increment-related kinematic changes and their association with overuse injuries.

**Results** Results revealed that kinematic patterns changed significantly in function of power output ( $p < 0.024$ ). More so, frontal plane control of trunk and pelvis during down stroke were significantly associated with injury prevalence ( $p < 0.042$ ). This kinematic variability presented no direct association with the slope of the heart rate curve nor maximal power output.

**Conclusions** Cycling kinematics differ significantly in function of power and the presence of physical complaints, irrespective of performance capacity. This might have repercussions on comfort, performance and injury susceptibility in cycling. Besides a carefully customized bike-fit, control in the trunk and pelvis are suggested to be essential to optimize comfort and reduce injury risk.

**372** 23% OF RACE ENTRANTS IN A MASS-PARTICIPATION COMMUNITY-BASED 100 MILE CYCLING RACE REPORT A PRE-RACE LONG-TERM MEDICAL CONDITION

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**Background** Medical encounters in mass-participation community-based cycling events are not uncommon and may be related to underlying chronic disease or risk factors for chronic disease in race participants.

**Objective** To describe the prevalence of medical conditions, including cardiovascular disease (CVD) risk factors, amongst participants in a mass-participation community-based cycling race.

**Design** Cross-sectional observational study.

**Setting** 100mile mass-participation community-based cycling race.

**Participants** All participants who had registered to take part in the event were invited to complete an online medical survey in the week before the event. 4099 cyclists (16.8% of 24431 finishers) completed the survey and were included in the analysis.

**Assessment of Risk Factors** Prevalence (%) of cyclists with risk factors including age and gender, medical history, smoking and use of medication.

**Results** The average age of respondents was 46 years (range 18–80 years; 41% were >50 years) and 76% were male. Respondents trained for an average 83 miles per week over 16 weeks for the event. 28% of all respondents reported using a prescription medication while the prevalence of a long-term medical condition (LTMC) was 23%. The prevalence of specific CVD risk factors or medical conditions in all respondents was: males > 50 years (34.8%;  $n=1428$ ), current or ex-smokers (32.1%;  $n=1314$ ), hypertension (4.2%;  $n=171$ ), a known cardiac disease (including atrial fibrillation and myocardial infarction) (2.2%;  $n=91$ ). 3.6% were taking medication for hyperlipidaemia ( $n=149$ ).

**Conclusions** In a sample of entrants for a mass-participation community-based 100-mile cycling event, approximately 1 in 3 participants reported prescription medication use, and 1 in 4 reported a long-term medical condition. Risk factors for CVD were reported by a third of entrants, while 2.2% reported a known CVD. Medical teams at such events should be prepared to manage medical complications related to long term medical conditions and CVD risk.

**373** ENDURO MOUNTAIN BIKING INJURIES DURING THE ENDURO WORLD SERIES: A TWO-SEASON PROSPECTIVE STUDY

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**Background** The sport of Enduro is the newest Union Cycliste Internationale (UCI) sanctioned discipline in mountain biking and there has been a surge in its popularity and participation. Although there are a number of studies reporting mountain biking injury the study methods vary widely, there are few at elite level, and there are none currently detailing injuries at elite level Enduro mountain biking.

**Objective** To determine the rate, severity and nature of rider injury during racing and official training at the Enduro World Series (EWS).

**Design** 2-season prospective epidemiology study (2017 & 2018).

**Setting** Male and female riders competing in the EWS.

**Patients (or Participants)** 2,010 (90.3% male) under-21, senior and masters riders from 46 countries, during 10 race events.