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Leg muscle recruitment during cycling is less developed in triathletes than cyclists despite matched cycling training loads.

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Studies of arm movements suggest that interference with motor learning occurs when multiple tasks are practiced in sequence or with short interim periods. However, interference with learning has only been studied during training periods of 1-7 days and it is not known if interference with learning continues during long-term multitask training. This study investigated muscle recruitment in highly trained triathletes, who swim, cycle and run sequentially during training and competition. Comparisons were made to highly trained and novice cyclists, i.e. between trained multidiscipline, trained single-discipline and novice single-discipline athletes, to investigate adaptations of muscle recruitment that occur in response to ongoing multitask, or multidiscipline, training. Electromyographic (EMG) activity of five leg muscles, tibialis anterior, tibialis posterior, peroneus longus, gastrocnemius lateralis and soleus muscles, was recorded during cycling using intramuscular fine-wire electrodes. Differences were found between trained triathletes and trained cyclists in recruitment of all muscles, and patterns of muscle recruitment in trained triathletes were similar to those recorded in novice cyclists. More specifically, triathletes and novice cyclists were characterised by greater sample variance (i.e. greater variation between athletes), greater variation in muscle recruitment patterns between pedal strokes for individual cyclists, more extensive and more variable muscle coactivation, and less modulation of muscle activity (i.e. greater EMG amplitude between primary EMG bursts). In addition, modulation of muscle activity decreased with increasing cadence (i.e. the amplitude and duration of muscle activity was greater at higher movement speeds) in both triathletes and novice cyclists but modulation of muscle activity was not influenced by cadence in trained cyclists. Our findings imply that control of muscle recruitment is less developed in triathletes than in cyclists matched for cycling training loads, which suggests that multidiscipline training may interfere with adaptation of the neuromuscular system to cycling training in triathletes.