

IN-SEASON CONCUSSION SYMPTOM PRESENTATION IN MEN'S AND WOMEN'S RUGBY

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ABSTRACT

Concussive injuries are prevalent in many sports, but risk is higher in full-contact, team sports such as rugby. Between 13% and 17% of rugby players sustain a concussion each season. The style of play and lack of effective protective equipment put athletes at a higher risk for concussive brain injuries that can result in neurological impairments. Diagnosis of concussion includes assessment of athlete reported symptoms, but the rates of underreporting remain high due to players' attempt to shorten their return-to-play time. The objective of this study was to investigate in-season presentation of symptoms characteristic of concussion and their relationship to head impacts sustained on the field. A matched cohort of male and female rugby players were studied over a six week period in the middle of a season. Head impacts from games and practices were tracked through video identification and a Graded Symptom Checklist was administered weekly to each athlete. The survey included 27 symptoms that were graded on a scale of 0-6, with 6 being the most severe. The aggregate score for each week is the Symptom Severity Score (SSS). On average, the men and women reported 1.8 symptoms per week, with a total SSS of 2.6. Approximately 25% of athletes reported an SSS greater than or equal to 10 (23.1% of men and 26.3% of women). Although SSS were elevated, they are much lower than those typically associated with concussions. Headaches were the most common symptom reported by the women, while fatigue was the most commonly reported by the men. More than 63% of subjects that reported elevated symptom scores experienced a head impact in the week leading up to the symptom survey. This study demonstrated that symptoms associated with concussion could be observed after head impact in the absence of diagnosed concussion in-season.

Keywords: Head impact, biomechanics, underreporting, subconcussive

INTRODUCTION

Concussions are brain injuries that are induced by biomechanical forces resulting from impact to the head [1]. They affect the brain through a complex pathophysiological process and characteristically result in the onset of acute neurological impairments [1]. Sports-related concussions can be diagnosed with an assessment of athlete-reported symptoms, physical signs, cognitive or neurobehavioral impairment, or sleep disturbances [1]. However, detection and diagnosis are complicated by a player's tendency to underreport or hide symptoms in order to shorten return-to-play time [2]. This is a growing concern, as the consequences for subsequent impacts while still sustaining symptoms from a previous concussion can be catastrophic [3]. Underreporting has also been attributed to players' lack of knowledge of potential consequences of head injuries and their inability to recognize signs and symptoms of concussions [4]. Some sports-related concussions present symptoms immediately and can be attributed to a single impact. Others, however, result in a delayed symptom presentation and thus make identifying a single impact more challenging [5-7]. It is not yet known how cumulative head impacts affect the pathophysiology of the brain or the clinical manifestation of injury, but a player's concussion history has been shown to be related to a slower neurological recovery [8].

Concussion is a concern in many sports, but risk is higher in full-contact, team sports [9]. Rugby is the most popular full-contact, team sport in the world, and has a correspondingly high concussion rate [9]. Although style of play varies, it has been reported that between 13% and 17% of rugby players sustain a concussion each season [10]. This is due to the physicality of the sport, usually played without protective equipment [11]. Some athletes choose to wear mouthguards and soft-shell headgear, but neither have been