

Using the PHQ-9 to identify and manage depressive symptoms in patients with sport-related concussion

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Concussion patients might present with different constellations of symptoms, making management challenging. Two recent cases of college students, one with suicidal thoughts and one with panic attack, demonstrate how important it is to identify serious mental health issues associated with postconcussion patients. In each case, the Patient Health Questionnaire-9 (PHQ-9) was used by the family physician to engage the patient in a fruitful dialogue, enabling a thorough exploration of the patient's concerns and a speedy and successful clinical outcome. However, this tool could be used at the earliest stage of concussion diagnosis and during follow-up. It can be implemented concurrently with the Sport Concussion Assessment Tool, 5th edition (SCAT5), to better predict and prevent future serious mental health events.

These cases demonstrate important lessons for family physicians when screening patients with concussion. The US Preventive Services Task Force recommends screening children and adolescents 12 to 18 years of age for major depressive disorder.¹ Kroenke et al found that the PHQ-9 is a reliable and valid measure of depression severity.² The SCAT5 is recognized as a current best-practice assessment tool.³ These cases have prompted implementation of regular postconcussion PHQ-9 screening in addition to SCAT5 screening in a family physician's clinical practice, as anticipating and preventing bad sport-related concussion (SRC) outcomes is of paramount importance.

Cases

The 2 students were varsity athletes attended by a family physician with a focused practice in sport and exercise medicine (SEM). An 18-year-old female student athlete was taking 40 mg of fluoxetine daily for an anxiety disorder before her injury. During a preseason tryout she was struck in the jaw by a flying baseball bat. She was assessed at an emergency department, had normal findings on jaw x-ray scans, and was given a concussion diagnosis. She had no previous concussion history. Eight days after her concussion she consumed an excessive amount of alcohol and then felt so guilty and overwhelmed that she consumed a month's worth of her fluoxetine at once. She was taken back to the hospital emergency department where her overdose was managed and a mandatory 72-hour psychiatric evaluation was ordered. If used early, the PHQ-9 might have helped anticipate this suicide attempt. Her SEM only became aware of her concussion 1 week after her hospital discharge for the overdose, and at that first meeting she answered PHQ-9 item F with "2," indicating that she was feeling bad about herself more than half of the time. On item I, she responded "1," indicating that for several days she had had thoughts that she would be better off dead or hurting herself in some way. Her PHQ-9 score was 18, which indicated moderately severe depression. However, as her anxiety and depression symptoms had abated considerably, we agreed with her strong request for no additional medication. We discussed her safety plan and the SEM showed her the Anxiety Canada website (<https://anxietycanada.com>),⁴ which has a link to the MindShift app and a

Editor's key points

- ▶ Patients with a history of mental health issues might be at risk of recurrence after a concussion.
- ▶ Using the Patient Health Questionnaire-9 in addition to the Sport Concussion Assessment Tool, 5th edition, appears to provide added benefit in detecting symptoms of depression.

- ▶ Family physicians should consider incorporating the Patient Health Questionnaire-9 into sport-related concussion assessments to prevent severe mental health sequelae.

Points de repère du rédacteur

- ▶ Les patients qui ont des antécédents de problèmes de santé mentale peuvent être à risque d'une récurrence après une commotion cérébrale.

- ▶ le recours au Questionnaire sur la santé du patient PHQ-9, de concert avec la 5^e édition de l'Outil d'évaluation des commotions cérébrales dans le sport SCAT5, semble être avantageux pour le dépistage des symptômes de dépression.

- ▶ Les médecins de famille devraient envisager d'intégrer le Questionnaire sur la santé du patient PHQ-9 dans les évaluations des commotions cérébrales liées aux sports pour prévenir des séquelles graves en santé mentale.

very helpful section directed at youth. The SEM subsequently followed her biweekly. The use of the PHQ-9 at follow-up visits helped the SEM to manage her recovery. She learned cognitive-behavioural therapy techniques from the SEM at follow-up visits. Within 2 months she was symptom free and resumed her academic and athletic activities. However, 5 months later she had another concussion after hitting her head on a television upon entering the gym. This time the PHQ-9 was used by her SEM early in her clinical course and at follow-up visits, as her depression symptoms recurred. She was cautiously prescribed sertraline in 1- to 2-week amounts and was followed biweekly with demonstrable improvement.

Another 19-year-old female student athlete at the same college started taking anxiety medication prescribed by her own family physician 2 months before her concussion. She was playing soccer and in the last minute of the game she collided with an opponent and struck her occiput on the turf. She got up immediately and felt fine. However, 2 days later during a long team bus ride, she noticed her eyes were sensitive to her computer screen's light and she could not focus. Her team therapist strongly suspected concussion and she indeed recognized several symptoms, as she had had 3 previous concussions. Her concussion was managed by her athletic therapy team with the appropriate protocols and she was not allowed to return to play. Two weeks after her injury, she became overwhelmed on the day of her team's first provincial playoff game. She felt that she was letting her team down because of her injury and exclusion from play. This developed into a panic attack, which required several of her teammates and her student athletic therapist to support her. She told them she was fearful of being left alone, lest she do some considerable self-harm. Her SEM assessed her a few days after the panic attack and used the PHQ-9 (along with the Generalized Anxiety Disorder-7 scale⁵) to determine the severity of her mental health concerns. She scored low on both these measures and, with some counseling, she had an uneventful recovery aided by these clinical tools.

Discussion and conclusion

These cases are important because the adverse outcomes soon after concussion could have been better predicted and avoided. Individualized rehabilitation in concussion management is important and might involve several allied health professionals. However, these other professionals likely lack a family physician's depth and breadth of mental health training and case management. Therefore, it is crucial for family physicians to explore patients' worrisome mood-related answers at the first visit after a concussion. Research suggests that up to 20% of collegiate athletes display an increase in depressive symptoms following SRC, compared with only 5% in a control group.⁶ Recent studies identified 6 clinical profiles

or subtypes of SRC, one of which is the anxiety-mood profile. Athletes with this profile experience predominant emotional disturbance and anxiety after SRC.⁷

One lesson learned is that the current SCAT5 does not alert allied health practitioners adequately regarding the severe mental health sequelae of concussion. Our PubMed search of MeSH words *concussion assessment* and *PHQ-9* yielded 18 articles and our Google Scholar search of *SCAT5* and *PHQ-9* yielded 8 articles. One systematic review does indicate that the PHQ-9 was used in many of the included studies.⁸ None of these studies featured the context of concurrent usage at the family physician's initial assessment as we have described. Thus, there is no current strong evidence that combining the PHQ-9 with the SCAT5 provides benefit; however, the only apparent risk is likely the increased time required to conduct the clinical encounter. Yang et al identified that students who had a concussion had higher odds of self-harm, depressive symptoms, attempted suicide, and injury from attempted suicide.⁹ Wangnoo et al concluded that it is imperative to educate parents, teachers, and health professionals on how to recognize a concussion and any possible mental health outcomes as a result.¹⁰ Frémont noted that the impaired functional status that results from a concussion is an important source of anxiety that can lead to depressive symptoms.¹¹ Earlier identification of these mental health concerns by including the PHQ-9 with every SCAT5 evaluation for SRC might pre-empt bad outcomes. 

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Competing interests

None declared

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