Letters to the Editor

Effectiveness of mouthguards in reducing neurocognitive deficits following sports-related cerebral concussion

Dear Dr Andersson, Editor-in-chief Dental Traumatology

As a dentist and supporter of neurocognitive testing for our athletes, I was pleased to see an article published that describes attempts to study the relationship between sports mouthguards and concussions (1). This is the beginning of trying to put some objective data behind long asked questions about the relationship of sports mouthguards and various brain injuries.

As a study design however, I think improvements can be made for future evaluations. In any study, we need to take great care in establishing the constants and variables. It seems the authors made attempts to select their subjects carefully by excluding attention-deficit/hyperactivity disorder (ADHD) and other learning disabilities from the evaluations. This clearly removed a significant variable resulting in a more constant pool of subjects and adds validity to the neurocognitive data. However, the authors did not do the same in looking at the sports mouthguards. If we are going to create a study to evaluate the influence of a piece of equipment worn by an athlete and then evaluate with objective neurocognitive testing data, I would think you would make efforts to establish a constant of a defined mouthguard, or at least consider how to subdivide the mouthguards into types, fit, and condition, etc. I have no way of knowing from reading this article whether the mouthguards were covering back teeth, paper thin, properly fitted, etc. If this study was carried out to compare helmet influence on concussion prevention, you would certainly have defined and described the helmet types and variations. These are just thoughts for future studies or reevaluation of the data from this study. I look forward to more studies of this type.

Sincerely,

Leslie A. Rye President Academy of Sports Dentistry, Reston, VA, USA

Response

Editor:

We would like to thank Dr. Rye for her Letter to the Editor discussing some of her concerns with our recent report (1).

We agree with Dr Rye that our study establishes an important first step in a line of research that may better address the relationships between mouthguard use and protection against various forms of brain injuries. Although we cannot generalize our findings to all brain injuries that may be sustained while participating in sports, our study suggests the use of mouthguards has no effect on reducing acute clinical neurocognitive performance deficits in the context of sports-related cerebral concussion.

As stated in our discussion, we concur that a more detailed investigation of mouthguard types is warranted. While we acknowledge our study did not discriminate between different types of mouthguards (i.e. generic stock, boil-and-bite, and custom made) available to athletes, we lacked sufficient sample size to adequately represent each individual type of mouthguard in our analyses; any findings as a result would not have been sufficiently conclusive and arguably void of interpretation with no basis for comparison. Our study, as Dr Rye suggests, provides that important basis for future work. Another important aspect, we agree, pertains to the fit of the mouthguard. Our discussion further illustrates that, in addition to different types of mouthguards, there also exists the question of differing material properties (i.e. thin vs thick, polyethylene vinyl acetate vs tri-laminant composites). In order to more fully answer these specific aims, a substantial sample size would need to be recruited into a large prospective study whereby type, material, condition, and hours of mouthguard use would be carefully evaluated and documented on a daily basis. We agree this is an important question for sports medicine professionals including certified athletic trainers, team physicians, and dental professionals, and any member of the sports medicine team mandated with the care of our athletes.

We would like to emphasize that our findings should not be interpreted to suggest the use of mouthguards are not recommended for athletes. While we agree that continued research as to their This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.