

Paradigm Change in the Treatment of Sports-Associated Concussion

Paradigmenwechsel bei der Versorgung der Sportassoziierten Concussion

Besides neurological health sports, sports-associated concussion (SaC) is certainly one of the most clinically and scientifically recognized topics within sports neurology. In recent years, the understanding and treatment of concussions has changed significantly. These changes have largely been driven by scientifically collected data and the updating of evidence- and consensus-based guidelines, particularly those of the Concussion in Sport Group (CISG) (1).

The most important of these updates, such as those representing a paradigm shift in pathophysiological understanding and treatment, are listed in the dossier of the current issue, and it is now up to us to implement them appropriately. As many medical and para-medical disciplines and professional groups are (or should be) involved in the care of athletes with SaC, it is now important to communicate and teach the relevant guidelines and recommendations to all relevant providers in a target group-specific manner. This also includes coaches, parents, and athletes themselves. One example of such an approach is the brochure "Head Injuries" along with the embedded concussion protocol of the German Football League (DFL) (2), which is signed and accepted by all coaches, managers, and doctors of the clubs in the 1st and 2nd Bundesliga.

Discussion and the chronic consequences of SaC

Unfortunately, some topics related to SaC are also discussed rather emotionally than rationally. In particular, the discussion about the chronic consequences of SaC or repetitive subclinical head impacts is often more emotionally charged than scientifically rational. The at least partially different interpretation of the same scientific data, e.g., with regard to the (long-term) effect of head impacts in different soccer associations, which has led to different recommendations for dealing with head impacts, shows the need for further research. However, we should be encouraged not to hide behind a lack of data, but rather make recommendations to the best of our knowledge and considering all aspects and data on this complex topic. For example, some soccer associations have banned headers in certain age groups (usually < 12 years), while others, such as the German Football Association (DFB), have issued age-adjusted regulations instead of categorical bans (3).

Research needs

Long-term improvement in the care of SaC requires scientific data that meets high-quality standards, is clinically usable, and generalizable. This includes longitudinal studies on repeated subclinical head impacts, adequate recording and characterization of the potentially pathological stimulus (e.g., type and situations of head impacts) and valid clinical (surrogate) parameters, a hypothesis- and pathogenesis-based approach, individual predispositions and as many potentially behavioral neurodegenerative (co-)risk factors as possible. In particular, the influences of the periodization of training and, thus, also the timing of the potentially pathological stimuli along with the mutual influence of risk factors on each other (and especially on the recovery of SaC) are important factors to be implemented in research protocols.

Funding of research

In translational and healthcare research, regional (and national) specificities of the organization of sports and the respective healthcare system should also be considered. For example, both the structure of medical care and the organization of sport itself differ significantly between Germany and other parts of the world (especially North America) from which the data on which the CISG recommendations are based originate, and not all results may not be transferred directly without adjustment. The Federal Institute of Sport Science (BISp) has addressed this problem several years ago by supporting and initiating a variety of translational activities. These include raising awareness for SRC, networking, knowledge transfer and research funding. As part of research funding, numerous projects on SaC and repeated subclinical head impacts (especially head impacts) have been and are being funded in Germany as part of the former funding priority (2017).

Articles in the current Issue

Some of the resulting findings are published in the current issue: Kern et al. discuss kinematic results in the study of headers in women as a function of flight length and other characteristics (4), Reeschke et al. provide neurocognitive, vestibulo-ocular, and balance data from baseline studies in adolescent soccer and basketball players, which could potentially inform SaC management in the future (5), and >

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Fohrmann et al. report on (problems with) the validation of a system for the investigation of neuro-ophthalmological functions on the sideline (6). In addition, aspects SaC in Paralympic sports, which is specifically underresearched are summarized in a review by Bhagyashree et al. (7). The current “Standard of Sports Medicine” (Clinical Review: Heart Rate Variability - Methods and Analysis in Sports Medicine and Exercise Science (8)) in this issue also takes up an interdisciplinary sports neurological topic, which is also important for SaC related topics, because autonomic nervous system changes may not infrequently be encountered as a result of SaC (9).

Conclusion

An incredible amount has already been achieved in recent years with respect to scientific understanding and clinical management of SaC. However, only high-quality research and not media coverage will help to ensure that knowledge does not stagnate at this point, but rather embark to answer the very relevant, yet unanswered questions by means of evidence. And who knows what surprises and paradigm shifts are still to come... ■

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