The Science of Jugular Compression: A Potential Solution to Protect Athletes and Youth from Sport-Related Concussion and a Testimonial on the Use of the Q-Collar Medical Device as a Part of a Concussion Protocol Program

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Abstract: An important topic of discussion that should be considered by the Subcommittee on Sports-Related Concussion is jugular compression and the medical device called the Q-Collar, which has been approved for sale in Canada by Health Canada as a Class 1 Medical Device. It has come to our attention as we have been following the proceedings, that this research and the supporting clinical studies, have not yet been introduced to the subcommittee. This device is currently being used by athletes such as Luke Kuechly (Carolina Panthers), Vernon Davis (Washington Redskins), and Brad Keselowski (NASCAR). In addition, it has been used by Olympic athletes, by 90 players in the Saskatchewan Selects Football program, and by hockey, football, and soccer teams in successful clinical trials. While the science is relatively new, the device has been approved by Health Canada, and at a minimum it should be considered in relation to recommendations for concussion protocols in Canada or at least as a subject that should be studied further.

Key Words: medical device, preventative application, Traumatic Brain Injury, jugular compression, sports team, clinical studies

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Introduction and Summary of Case

Traumatic brain injury from sport is an issue of major concern and we are grateful for the work being done by the Subcommittee on Sport-Related Concussions in Canada. As an organization, Selects Football has been working diligently to keep athletes as safe as possible, while still allowing them to play the game of tackle football. We are concerned with the responsibility we bear in encouraging youth to play a sport that has come under the microscope with respect to brain trauma and mental health, and as such we feel invested in the subcommittee hearings. We have already been following, for several years, many of the recommendations for safety that have been suggested to date. Measures we have taken include: equipping the players with the highly rated Xenith helmet when it came out, and later with the Riddell Revolution helmet, implementing mandatory baseline testing using King Devick, working with Dr. Patrick Neary of the University of Regina in 2017-18 to perform baseline testing on our athletes through a process of infrared spectroscopy, and equipping 90 players this year with the Q-Collar, a medical device that utilizes jugular compression to help stabilize the brain and protect it from damages related to impact. In addition to that, we restrict contact in practices to a minimum level, use a mobile tackling dummy to teach tackling, keep our age groups to two-year age divisions as

recommended by Football Canada, and are moving to one-year age divisions this year. We also have an incredible training staff, complete with a licensed physician and physiotherapists. With everything we are trying to do to keep our athletes healthy, we are convinced that the Q-Collar medical device is the most important measure we have taken because it has the potential to mitigate brain trauma.

Statement of Problem

The problem, as stated, is the prevalence of concussion in sport and the risk to our youth and athletes that it poses. Governing bodies, whether it be in sport or government, look to protect those at risk and the challenge is to find a solution that will allow for responsible advocation for participation in any sport involving contact. The complicating factor is that most of the research has gone into treatment of symptoms as well as preventative measures such as restricting contact because, until recently, there has been no equipment that can protect the brain from concussive blows. The issue with focussing primarily on treatment of symptoms is that this suggests the inevitability of the continuation of a high number of traumatic brain injuries. Instituting measures that are designed to minimize or restrict contact are a start, but even if contact can be reduced it will remain a factor of competitive sport. Furthermore, in non-contact sports such as snowboarding, down-hill skiing, bull-riding, soccer, moto-cross, race-car driving, and so on, concussions are also a major concern. The question remains, then, how to protect the brain, and if it can be done. We believe it is possible, and we are encouraged by the science and methodology behind the Q-Collar.

Proposed Solution

The science behind jugular compression is ancient and its application in terms of protecting the brain from trauma has recently been extensively researched. The Q-Collar uses the body's own physiology to help stabilize the brain by applying light pressure to the jugular veins. This pressure slightly increases blood volume inside the skull and helps reduce the brain's movement – which is the primary cause of brain injuries, including concussions. The product has been extensively tested, with 20 clinical studies through 9 independent research hospitals with over 1000 study participants, 500,000+ impacts over 20 g's, and 16 clinical studies with football, hockey, and soccer players which have shown that the athletes who wore the Q-Collar were better protected from sports related impacts than those who did not. Research also shows that use of the Q-Collar has no negative impact on athletic performance. As part of additional research, the Q-Collar has been worn successfully by NFL, NASCAR, NCAA, and Olympic athletes. From our organization's standpoint (Selects Football), we believe so strongly in the preventative aspects of this product that, moving forward, each of our players will be given a collar upon registration. With this being a new product, there are those who, not surprisingly, say it has not been tested enough, but perhaps it should then be tested more. From our

standpoint, we have already made the commitment to try to educate and inform as many parents and athletes as possible about this device though any means we have at our disposal. We simply ask for the subcommittee to review the findings in these studies and consider that if this medical device, already approved by Health Canada, could help protect athletes in any way from impacts, then at a minimum is should be researched more in the hope that this piece of equipment would at some point be factored into a comprehensive plan for addressing concussion in sports. Our goal is to get collars on kids, and in this way we hope to avoid or lessen injury.

Conclusion

We do not feel that this is a conclusive plan on its own, but we strongly believe that it is an option to be used in conjunction with responsible standards such as: baseline testing, minimizing contact especially in younger age groups, uniform return-to-play protocols, qualified and educated trainers and coaches, and so on. It is our opinion, based on the studies reviewed as well as our own experience with using the Q-Collar, that this has the potential to become a mandatory piece of equipment in the future. At one time, the helmet was not mandatory, but this was changed as we are always looking to make decisions that that protect youth and athletes based on the best knowledge available. We now know that while the helmet protects against injuries such as skull fractures and bleeding on the brain, no helmet will stop the "slosh" as the brain is knocked around in the skull upon impact. Jugular compression is an ingenious concept and comes with no adverse affects and no danger. The results of the clinical trials noted below show that athletes who wore the collar during their sports seasons had virtually no changes to the structure of their brains while those who did not wear the collar experienced significant structural changes as seen with advance imaging techniques. Granted the product is new, and the studies are all relatively recent, but at a minimum, this application should be studied further based on the positive test results to date. We apologize for presenting this information at such a late date. We assumed that jugular compression would be brought up by one of the scheduled presenters and were interested to see how the information would be received. As the sessions are nearing an end, we realized that this topic was not being brought up and we are hoping that this oversight can still be corrected so that the subcommittee has the most comprehensive outlook possible in order to address the health and safety of our youth and our athletes.

Evidence

Basic Science

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