TITLE: Mouthguards for the Prevention of Dental Injuries and Concussions: Clinical Effectiveness

DATE: 12 February 2016

RESEARCH QUESTIONS

1. What is the clinical effectiveness of the use of mouthguards for the reduction in the number and severity of dental injuries resulting from contact sports?

2. What is the clinical effectiveness of the use of mouthguards for the reduction in the number and severity of concussions resulting from contact sports?

KEY FINDINGS

Three systematic reviews, one randomized controlled trial, and five non-randomized studies were identified regarding the clinical effectiveness of mouthguards for the prevention of dental injuries or concussions during contact sports.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. The search was limited to English language documents published between Jan 1, 2006 and Feb 2, 2016. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.
SELECTION CRITERIA

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

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<th>Table 1: Selection Criteria</th>
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<td>Population</td>
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| Outcomes                    | Q1: reduction in number and severity of dental injuries (teeth, oral cavity). Advantages and disadvantages of using a mouthguard during contact sports (related to dental/oral cavity issues)  
Q2: reduction in number and severity of concussions. Advantages and disadvantages of using a mouthguard with respect to concussions. |
| Study Designs               | Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies |

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials and non-randomized studies.

Three systematic reviews, one randomized controlled trial, and five non-randomized studies were identified regarding the clinical effectiveness of mouthguards for the prevention of dental injuries or concussions during contact sports. No relevant health technology assessments were identified.

Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

Three systematic reviews\(^1\)\(^-\)\(^3\) examined the effectiveness of mouthguards for the prevention of concussions. The reviews agreed that evidence was inconsistent and results inconclusive for determining if wearing mouthguards could reduce the incidence of concussion in contact sports. One of the systematic reviews\(^3\) also examined the effectiveness of mouthguards in preventing orofacial injuries. Meta-analysis\(^3\) showed that there was a decrease in the risk of orofacial injuries when a mouthguard was worn, but the abstract did not indicate if this decreased risk was considered to be clinically significant.

One randomized controlled trial\(^4\) examined mild traumatic brain injury (MTBI) and concussion injuries in 412 high school football athletes, comparing custom-made mouthguards to over-the-counter mouthguards. The study concluded that wearing custom-made mouthguards resulted in significantly lower incidence of MTBI/concussions than over-the-counter devices.

Two non-randomized studies\(^5\)\(^,\)\(^10\) examined the relationship between use of mouthguards and dental injuries. One study (number of participants not reported) found a significant reduction in orofacial trauma and complications with the use of mouthguards by rugby players.\(^5\) The second
study (N = 267) looked at outcomes for both orofacial and cerebral injuries and found that 68% of athletes had never suffered orofacial or cerebral injuries while wearing a mouthguard.\textsuperscript{10}

Three non-randomized studies\textsuperscript{7-9} investigated concussion injuries. Two of the studies focused on high school football players.\textsuperscript{7,8} One study (N = 2,081) found that players who wore custom-made mouthguards sustained more concussions than players who wore generic mouthguards.\textsuperscript{7} The second study investigated only custom-made mouthguards in a cohort of 28 players, and found that use of these decreased the incidence of concussion or mild traumatic brain injury.\textsuperscript{8} The third study was comprised of student athletes who had sustained a sports-related concussion.\textsuperscript{9} The study found that use of mouthguards did not decrease the severity of concussion.

One non-randomized study (N = 1,504) examined the incidence of sports-related injuries during contact flag football, after implementing four different measures (no-pocket rule, self-fitting mouthguards, ankle braces, and injury treatment information).\textsuperscript{6} There was no statistically significant reduction in dental injuries or concussions compared with a two-season historical cohort, although the authors did recommend strict enforcement of all four measures for this sport.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses


Randomized Controlled Trials


Non-Randomized Studies


APPENDIX – FURTHER INFORMATION:

Clinical Practice Guidelines and Consensus Statements


Review Articles


Additional References
