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Short Communication

Relationship Between Oral Health and Physical Activity

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Introduction

Chronic non-communicable diseases are the major cause of death in industrialized countries. Physical activity is among the forms of therapy to prevent and treat these diseases. In the dental field this is important as many studies describe a relationship between oral health and physical activity. Many researches describe how physical activity improves overall health, conversely many studies show how professional athletes can have problems related to the oral cavity [1]. The nexus between sport and oral health has largely been investigated through studies focused on the risk of trauma, dental caries, dental erosion and periodontal inflammation [1]. Poor oral health results in lower quality of life and could affect athletic performance. However, the relationship between oral health and performance is not well understood [2-4]. Numerous studies report a relationship between strenuous physical activity and problems referred to the oral cavity. One of these systematic reviews describes that dental caries, periodontal disease, dental erosion and pericoronitis were widely represented in the oral cavity of athletes. The range of proportion of athletes affected by these conditions were moderate-to-severe periodontitis up to 15%, dental caries 15-75%, pericoronitis 5-39% and dental erosion 36-85 Dental trauma was present by 14-57% of athletes in at-risk sports. Disease incidence was generally not clearly differentiated by socioeconomic status, however, poor oral health appears to affect athletes both from developing and developed countries. The available evidence suggests that poor oral health is common in elite or professional athletes and the oral health of elite athletes is similar to non-athlete disadvantaged populations [5].

Performance

The relationship between oral health and performance is difficult to evaluate. Whilst dental and oro-facial trauma or severe infection can take an athlete out of training or competition (time loss injury) other health impacts (including from oral health) are likely to be of less magnitude and therefore challenging to measure. Although smaller in magnitude, these impacts could be important to training and performance and could be considered similar to the potential effect of overuse injuries i.e. an athlete may continue to train and compete but at lower intensity or efficiency. For this reason, sports medicine research has focused on developing self-reported tools of which the best validated is the Oslo Sports Trauma Research Tool (OSTRC) [6]. When employing such tools, an interesting pattern emerges. Typically, 20-30% of athletes reported a negative impact of their oral health on training or performance. More specific questions reveal: 35% athletes reported difficulties eating or drinking, 17% difficulties smiling, laughing or showing teeth without embarrassment and 15% difficulties relaxing. Therefore, elite and professional athletes commonly report a negative impact of their oral health on their training and performance and in addition, more specific effects on wellbeing.

Identifying the pathways by which oral health affects performance is ongoing research. Such pathways could include physical effects such as raised systemic inflammation resulting from oral disease as well as psychosocial effects through pain, self-reported bleeding and appearance. No direct evidence has yet been published that identifies an impact of oral inflammation on sport performance. However, in non-athlete populations, periodontitis has been found to be a risk factor for low cardiorespiratory fitness in sedentary non-smoking men [7]. These findings were confirmed in a cross-sectional analysis of two large German cohorts, including 1,639 and 2,439 subjects, respectively [8]. Probing pocket depth (PPD) was consistently associated with VO2peak as well as exercise duration. Interestingly, this association remained significant after restricting the analysis to cardiorespiratory healthy participants only. Similarly, periodontitis was associated with poorer physical activity test results in male police officers following adjustment for age, BMI, and regular exercise [8,9]. There was a dose response with poorer outcomes associated with severity of periodontitis.

In addition to raised systemic inflammation another pathway for impact on performance is through psychosocial impacts. Many researches have published statistically significant associations between a number of the factors described earlier with negative performance impacts [2-4]. These factors are also commonly associated with impacts on oral health related quality of life and therefore highly plausible that they might affect performance. In relation to the other self-reported impacts mentioned earlier regarding common effects of poor oral health in athletes on eating and drinking, sleep and relaxation, there are additional possibilities that there could be negative effects on nutrition and sleep hygiene both of which are key to supporting athlete performance, recovery and wellbeing [10].

Conclusion

Physical activity is crucial to the overall health of the body, yet if not managed properly it presents risks to the oral cavity. Performance impacts from oral health are hard to research because of their relatively lower magnitude although important within high performance sport. Nevertheless, negative performance impacts are common. The evidence is clearest for psychosocial effects arising from poor oral health. In non-athlete populations, periodontal inflammation is associated with reduced measures of fitness and may point to a further effect of the well-established phenomenon of raised systemic inflammation caused by periodontitis and other oral infections [1-4].

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