Evidence-Based Dentistry (2000) 2, 102

www.nature.com/ebd

summary

Children with overjets of over 3mm are at higher risk of dental trauma

Nguyen QV, Bezemer PD, Habets L, Prahl-Anderson B. A systematic review of the relationship between overjet size and traumatic dental injuries. Eur J Orthodont 1999; 21:503–515

Objective To aggregate the risk of traumatic dental injury caused by overjet.

Data sources Medline (1966–1996) Excerpta Medica (1985–1996) using keywords malocclusion, overjet, trauma, fractured teeth, injuries, epidemiology as well as references of identified articles.

Study selection The authors included studies concerned with the relationship between overjet size (in millimetres) and traumatic injuries to teeth; those considering only prevalence were excluded. Quality assessment of included studies was carried out.

Data extraction and synthesis A 2×2 table was constructed relating overjet size and trauma for each study and odds ratio calculated. Cut-off points for overjets were 3mm and less, more than 3mm and 6mm or more on the basis of data presented in studies.

Results Eleven studies were included. Pooled odds ratios for all studies of overjet of 3mm and less versus 3mm or more showed significant heterogeneity, and therefore a sensitivity analysis was performed (see table).

Overjet	⩽3 mm vs > 3 mm	⩽3 mm vs ⩽6 mm
	Odds Ratio (95%CI)	Odds Ratio (95%CI)
All studies (11)	2.30 (2.04–2.58)	2.63 (2.03–3.29)
Highest quality studies (3)	2.17 (1.87–2.51)*	–
Girls (4)	2.90 (2.33–3.76)*	–
Boys (4)	1.77 (1.41–2.20)*	–

*No significant heterogeneity

Conclusions Children with an overjet greater than 3mm are at approximately twice as high risk of dental trauma as those with an overjet of less than 3mm.

Address for reprints: Dr QV Nguyen, Department of Orthodontics, Academic Centre for Dentistry Amsterdam (ACTA) Louwesweg 1, 1066 EA Amsterdam, The Netherlands.

Commentary

Although there is evidence supporting the psychological benefits of orthodontic treatment[1] there is little evidence of dental health benefits. This paper aims, via a review of the literature, to investigate the commonly held belief that an increase in overjet produces an increased risk of dental trauma. If this is correct, there would be good evidence for orthodontic reduction of an overjet, if not to improve a patient's dental health but to prevent a deterioration.

Overjet measurement forms an important component of The Index of Orthodontic Treatment Need (IOTN)[2] and The Peer Assessment Rating (PAR Index)[3]. In the area of evidence-based dentistry, there is a need to justify the incorporation of components in orthodontic need and outcome indices. As an overjet increases, so does the level of orthodontic need according to IOTN.

The authors identified an apparent contradiction between some studies. Stokes et al[4] found an increase in overjet did not contribute to dental trauma, whereas others such as Petti and Tarsitani[5] found that patients with overjets of more than 3 mm were at two and a half times greater risk than those who had a normal overjet. By pooling the results of 11 different studies, the authors were able to reduce the bias that confounding factors such as age and sex may contribute.

The authors concluded that an overjet greater than 3 mm represents a two-fold increase in the risk of dental trauma and that girls are at higher risk than boys.

The implications of this study are two-fold. First, a general dental practitioner who either treats or refers a patient with an increased overjet will know that they are significantly reducing that patient's chances of dental trauma. Second, the incorporation of overjet in IOTN is clinically valid. A more recently developed occlusal index, The Index of Complexity, Outcome and Need[6] (ICON) does not include overjet measurement as a component but an increase in overjet contributes significantly to the aesthetic component of IOTN on which ICON is heavily biased. A larger overjet represents a greater risk which is identified by these indices as representing a greater need for orthodontic intervention.

1. Shaw WC, Meek SC, Jones DS. Nicknames, teasing, harassment and the salience of dental features amongst school children. Br J Orthodont 1980; 7:75–80.
2. Brook PH, Shaw WC. The development of an index of orthodontic treatment priority. Eur J Orthodont 1991; 11:309–320.
3. Richmond S, Shaw WC, O'Brien KD et al. The development of the PAR Index (Peer Assessment Rating) reliability and validity. Eur J Orthodont 1992; 14:125–139.
4. Stokes AN, Loh T, Teo CS, Bagramian RA. Relation between incisal overjet and traumatic injury: a case control study. Endod Dent Traumatol 1995; 11:2–5.
5. Petti S, Tarsitani G. Traumatic injuries to anterior teeth in Italian school children: prevalence and risk factors. Endod Dent Traumatol 1996; 12:294–297.
6. Daniels CP, Richmond S. The development of the Index of Complexity, Outcome and Need. J Orthodont 2000; 27: 149–162.

Nigel A Fox
Orthodontic Department, Middlesbrough General Hospital, Ayresome Green Lane, Middlesbrough, UK