Posturography as a diagnostic aid in dentistry: a systematic review
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CRD summary
This review concluded that available evidence did not support the usefulness of posturography as a diagnostic aid in dentistry. Despite limitations in the conduct of the review and given the poor quality and limited relevance of the identified evidence, this conclusion appears reliable.

Authors' objectives
To determine any correlations between the stomatognathic system and whole-body posture and to provide information on the relevance of posturography as a diagnostic aid in dentistry.

Searching
MEDLINE and Cochrane Central Register of Controlled Trials (CENTRAL) were searched up to 31st May 2009. Search terms were reported. References of retrieved articles were examined for further relevant evidence.

Study selection
Studies that used experimental or observational designs to investigate correlations between the stomatognathic system and body posture were eligible for inclusion. Case series and case reports were excluded. There were no restrictions on participants. Eligible studies had to be free of major biases in the statistical analysis and include groups with comparable characteristics at baseline. It appeared that two reviewers independently assessed studies for inclusion in the review.

Studies that met these criteria were predominately non-randomised controlled trials and non-controlled trials; there was one case-control study and a cross-sectional study. Studies recorded body posture under either static conditions (qualitative or quantitative posturographic parameters assessed by physical examination, postural platform, body photographs and rasterstereography) or dynamic conditions (Fukuda-Unterberger stepping test, analysis of gait rhythm and timing of posture recovery in response to external disturbances).

Most of the studies included asymptomatic patients with variable occlusal conditions, normal occlusion, unilateral crossbite or non-specified occlusal status; some studies included patients with functional disorders of the stomatognathic system or temporomandibular disorders. Most studies were in patients aged between 20 and 30 years; overall, the age range was wide (3.5 to 54 years, where reported). Interventions, where these existed, included use of intra-oral devices to change mandibular position, splints to modify masticatory muscle hypertonia, unilateral trigeminal anaesthesia, orthognathic surgery and external disturbance for challenging body equilibrium.

Assessment of study quality
Validity of individual studies was assessed using a modified 14-point scale of study design and conduct. Study quality could be rated as low (≤8 points), medium (9-10 points), medium/high (11-12 points) or high (>12 points).

Two reviewers independently assessed the validity of included studies in an unblinded manner. Disagreements were resolved by discussion.

Data extraction
Key characteristics were extracted for included studies. The effect size coefficient was calculated for each study where possible.

The authors did not state how many reviewers performed data extraction.

Methods of synthesis
Studies were combined in a narrative synthesis. Effect size coefficients were classified by size: with values of more than >0.2 considered biologically significant and values of 1.0 or more were regarded as the minimum value to consider the posturography as a reliable diagnostic tool.

**Results of the review**

Twenty-one studies (n=2,052) were included in the review. One study was rated medium/high quality and the rest were rated low quality. Flaws included lack of relevant information about participants, inappropriate statistical analysis, no a priori sample size calculation and lack of blinding.

Seven studies showed no significant correlations between the stomatognathic system and body posture. Four studies found some significant differences/correlations, but suggested caution in interpreting their data. Ten studies suggested their observed correlations were of clinical relevance.

Effect size calculations were possible for 13 studies. Of 204 effect size values, 98 (48%) were less than 0.2, 104 (51%) were between 0.2 and 1.0 and 2 (1%) were above 1.0.

**Authors' conclusions**

A correlation between the stomatognathic system and body posture could be detected under experimental conditions, but current evidence did not support the usefulness of posturography as a diagnostic aid in dentistry.

**CRD commentary**

The review question was broadly defined in terms of the participants, outcomes and study designs of interest. This led to the inclusion of studies with a wide variety of patients and (where they existed) interventions. Two databases were searched for relevant studies; it was unclear whether efforts were made to identify unpublished studies and studies published in languages other than English. Study quality was assessed with a published scale and efforts were made to minimise errors and bias in this process. The included studies were heterogeneous and the effect size thresholds used to classify the biological and clinical relevance appeared to be arbitrary. However, given the poor quality and limited relevance of the identified evidence, the authors conclusion that this evidence did not support the usefulness of posturography as a diagnostic aid in dentistry appears reliable.

**Implications of the review for practice and research**

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that further investigations of the relationship between the stomatognathic system and body posture with higher quality study designs were warranted. They added that studies should have adequate follow-up.

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