Orthodontic malloclusions and craniocervical posture: a systematic literature review

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INTRODUCTION

Increased number of body posture changes in growing children is found, it causes deviations in craniocervical posture. Clinical trials are performed to evaluate the relationship between head and neck posture and orthodontic malocclusions, however, the results vary.

AIM

The purpose is to analyze the relationship between craniocervical posture and Class I, II and III orthodontic malocclusions.

METHODS

The systemic review was carried out according to protocol and PRISMA statement. The electronic search by 3 independent researchers was performed from 16 October till 16 December 2021 in databases: PubMed, Wiley Online Library and Cochrane Clinical Trials Register. Following keywords were used: craniocervical posture, head posture, cephalometry, orthodontic malocclusion, Class II malocclusion. Inclusion criteria for the articles were: published less than 5 years ago, written in English, subjects human beings, craniocervical posture was evaluated performing cephalometric analysis. Exclusion criteria were the following: case reports, systemic or literature reviews, meta-analysis, studies with patients, having craniofacial syndromes or clefts, previous surgical, orthodontic, or physical therapy treatment.

RESULTS

After an initial search in electronic databases, following an examination of 438 initially identified articles 17 articles were assessed for eligibility and after applying the selection criteria 6 studies were included. Three studies were retrospective, two cross sectional and one pilot randomized controlled trial. In total 421 patients aged from 8 to 16 were involved. Studies (3,4) showed significant differences in OPT-SN (this angle shows postero-superior point and postero-inferior point of odontoides proportion with skull base line) (Class II ($100.80°\pm 11.10$)> Class I ($94.06°\pm 1.81$) and Class III ($94.59°\pm 1.80$), $p< 0.05$) and CVT-SN (Class II ($106.00°\pm 8.10$) > Class III ($101.52°\pm 7.18$), $p< 0.05$; Class I ($103.03°\pm 7.77$), n.s.) angles. One (5) of two (5,6) studies found a significant increase in OPT-SN angle in untreated Class II subjects ($p\leq 0.05$), while both studies found no significant difference in OPT-SN and CVT-SN in treated Class II subjects. Two studies (7,8) that evaluated oral and nasal breathers reported that subjects with higher values of ANB angle showed higher OPT-SN and CVT-SN angles, however, it was not statistically significant.
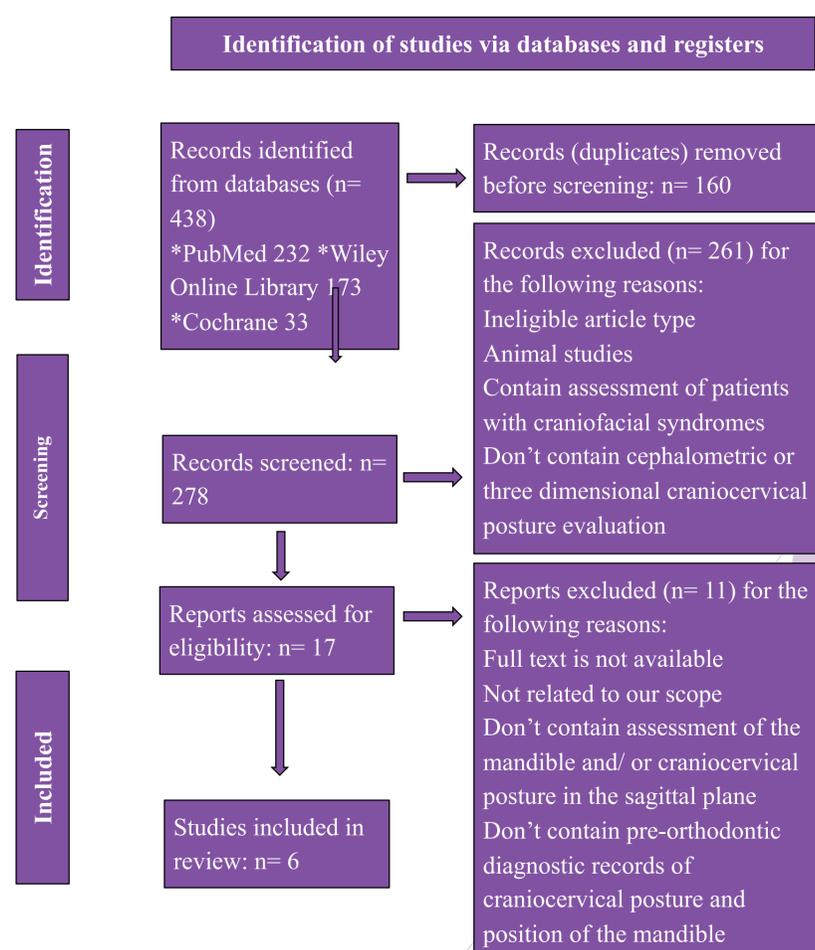
CONCLUSIONS

Based on a present systematic review, patients with class II orthodontic malocclusion tend to have higher craniocervical angles than patients with class III orthodontic malocclusion. Class II orthodontic treatment may have a positive impact on craniocervical posture. Nasal and oral breathers show no significant differences in their craniocervical posture and interjaw relationship.

Identification of studies via databases and registers

Identification

Records identified from databases (n= 438)
*PubMed 232 *Wiley Online Library 173 *Cochrane 33

Records (duplicates) removed before screening: n= 160

Records excluded (n= 261) for the following reasons:
Ineligible article type
Animal studies
Contain assessment of patients with craniofacial syndromes
Don't contain cephalometric or three dimensional craniocervical posture evaluation

Screening

Records screened: n= 278

Reports assessed for eligibility: n= 17

Reports excluded (n= 11) for the following reasons:
Full text is not available
Not related to our scope
Don't contain assessment of the mandible and/ or craniocervical posture in the sagittal plane
Don't contain pre-orthodontic diagnostic records of craniocervical posture and position of the mandible

Included

Studies included in review: n= 6

Prisma flow diagram

IHS
Conference