OP32 CLINICAL EFFECTIVENESS OF FIXED FUNCTIONAL APPLIANCES IN THE TREATMENT OF CLASS II MALOCCLUSION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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AIMS: To assess the treatment effects of fixed functional appliances (FFAs) in treated Class II patients versus their matched untreated controls by means of lateral cephalometric radiographs.

MATERIALS AND METHOD: Unrestricted and systematic literature searches of 18 electronic databases and complementary manual searches were performed up to October 2014. Only randomized and prospective non-randomized controlled clinical trials reporting on cephalometric angular measurements of Class II patients treated with FFAs and their matched untreated controls were included. Skeletal, dental, and soft tissue angular cephalometric measurements were annualized and stratified according to time point. The risk of bias within and across the studies was assessed by means of the Cochrane Risk of Bias tool, the Downs-Black checklist, and the GRADE approach. Mean differences (MDs) and the respective 95 per cent confidence Intervals (CIs) were calculated with the random-effects meta-analyses. Subgroup analyses and sensitivity analyses were performed with mixed-effects models.

RESULTS: Nine studies were included involving a total number of 244 treated patients (mean age: 13.5 years) and 174 untreated individuals (mean age: 12.8 years). Most of the included studies reported on cephalometric effects directly after removal of FFAs. FFA treatment was associated with statistically significant, but clinically small effects: In comparison to untreated individuals, a small annual reduction of the SNA angle (nine studies, MD = –0.83 degrees/year, 95% CI: –1.17 to –0.48), a small annual increase of the SNB angle (nine studies, MD = 0.87 degrees/year, 95% CI: 0.30 to 1.43), and a moderate annual decrease of the ANB angle (nine studies, MD = –1.74 degrees/year, 95% CI: –2.50 to –0.98) was observed. FFA treatment was also associated with significant dentoalveolar and soft-tissue treatments effects. Subgroup analyses indicated that several patient- or appliance-related factors seem to affect treatment outcome, yet their credibility remains questionable. The overall quality of evidence according to the GRADE approach ranged between ‘low’ and ‘very high’. The long-term effectiveness of FFAs could not be assessed due to limited relative evidence.

CONCLUSION: Based on current evidence, FFAs seem to be effective in improving Class II malocclusion in the short-term, yet their effects seem to be mainly dentoalveolar rather than skeletal.