OP39 THE IMPACT OF OBESITY ON ORTHODONTIC TOOTH MOVEMENT: A PROSPECTIVE COHORT STUDY

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AIM: Obesity is a widespread chronic inflammatory disorder characterized by an increased overall disease burden and significant association with periodontitis. The aim of this prospective clinical study was to investigate the clinical and biochemical effects of obesity on orthodontic tooth movement with fixed-appliances.

SUBJECTS AND METHOD: Fifty-five patients (27 males, 28 females) mean age 15.1 (SD, 1.7) years and a mean body mass index of 30.2 (3.5) in obese and 19.4 (2.2) kg/m^2 in normal-weight groups were followed from the start of treatment to completion of tooth alignment with fixed-appliances. The primary-outcome was the time taken to complete tooth alignment, whilst secondary outcomes included the rate of tooth movement and change in clinical parameters (plaque/gingival indices, unstimulated whole mouth salivary flow rate and gingival crevicular fluid biomarkers). Data collection took place at the start of treatment; 1 hour and 1 week following appliance placement; and at completion of alignment on placement of a 0.019 × 0.025-inch stainless steel archwire. The results were analyzed with descriptive statistics and generalized estimating equation regression modelling.

RESULTS: Obese patients needed less time to complete tooth alignment compared to those of normal weight (–23.1 days; 95 CI: –65.4, 19.2) but this was non-significant (P = 0.284). However, after adjusting for confounders, obese patients had a significantly higher rate of tooth movement compared to those of normal weight (+0.016 mm/day; 95 CI: 0.007, 0.025; P < 0.001). Additionally, explorative analyses indicated that levels of the adipokines leptin and resistin, the inflammatory-marker myeloperoxidase and the cytokine receptor for nuclear factor kappa-B ligand (RANKL) were significantly different between obese and normal weight patients and associated with the observed rates of tooth movement.

CONCLUSIONS: This investigation provides the first prospective data demonstrating a different response in obese patients compared to subjects of normal weight during orthodontic tooth movement with fixed appliances. These differences in the response of periodontal tissues to orthodontic force in the presence of obesity have potential short and long-term clinical implications.