ABSTRACT

**Background:** Orthodontic tooth movement includes alveolar bone modeling and remodeling processes which can be understood by evaluating the biomarkers of bone metabolism.

**Aim:** This study was performed to evaluate the changes in Alkaline Phosphatase levels in Gingival Crevicular Fluid (GCF) and saliva during en-masse retraction with a continuous force of 150 grams and validate the use of saliva as a diagnostic tool in orthodontics.

**Methods:** Saliva samples and GCF samples from the gingival sulcus in relation to mesio-labial line angle of right and left maxillary canines were collected for 10 patients at baseline, 1 hour, 3 days, 7 days, 14 days and 21 days after force application. The samples were assayed for Alkaline Phosphatase activity spectrophotometrically. The values were calculated statistically by using paired samples t test.

**Results:** There was an increase in enzyme levels from baseline to 21 days. There was no much increase from baseline to 1 hour but a gradual increase was seen till 3\(^{rd}\) day followed by a steep increase in 7\(^{th}\) and 14\(^{th}\) day. There was no much increase on the 21\(^{st}\) day. The peak in activity of the enzyme was noted on the 7\(^{th}\) day after force application and a sharp decline in the rise of enzyme activity after 14\(^{th}\) day. The pattern was found to be the same in GCF and saliva. The growth rates at each time interval was slightly lesser in saliva compared to GCF.

**Conclusion:** Alkaline Phosphatase reflects changes in alveolar bone turnover during orthodontic tooth movement. Saliva can be used as an alternative diagnostic tool to GCF to assess Alkaline Phosphatase but it does not provide site-specific changes in alveolar bone. GCF still remains the viable option when accurate, site-specific changes need to be assessed.

**Keywords:** Alkaline Phosphatase, Gingival Crevicular Fluid (GCF), saliva, en-masse retraction, alveolar bone turnover.