SDM
College of
Dental Sciences
& Hospital

A QUANTITATIVE ESTIMATION OF THE TARTRATE RESISTANT ACID PHOSPHATASE (TRAP) LEVELS IN GINGIVAL CREVICULAR FLUID DURING LOW LEVEL LASER THERAPY IN PATIENTS DURING ORTHODONTIC TOOTH MOVEMENT

By

DR. ANKIT JINDAL

Dissertation submitted to the
Rajiv Gandhi University of Health Sciences, Bangalore, Karnataka

In partial fulfillment
of the requirements for the degree of

MASTER OF DENTAL SURGERY (M.D.S)
In
ORTHODONTICS & DENTOFACIAL ORTHOPEDICS

Under the guidance of

DR. ANAND K. PATIL

DEPARTMENT OF ORTHODONTICS
& DENTOFACIAL ORTHOPEDICS
S.D.M COLLEGE OF DENTAL SCIENCES & HOSPITAL

DHARWAD

APRIL 2015

ABSTRACT

OBJECTIVES: To test both clinically and histologically, the hypothesis that mechanical forces combined with low-level laser therapy stimulates the rate of orthodontic tooth movement seen clinically by measuring the canine retraction and histologically by evaluating the levels of Tartrate Resistant Acid Phosphatase in the gingival crevicular fluid.

METHOD: This split-mouth study was conducted to estimate **Tartrate Resistant Acid Phosphatase** (TRAP) levels in **gingival crevicular fluid** (GCF) in the experimental side of 14 patients who required single maxillary canine retraction with closed coil NiTi springs, delivering a contant force of 150 grams in first premolar extraction cases with PAE following GaAlAs laser irradiation at $8J/cm^2$ and 100mW on the canine for 3 consecutive days. Control side TRAP estimation was done in GCF without laser irradiation. Rate of tooth movement was assesed with serial study model analysis over a 8 week period.

RESULT: There was a significantly greater distal movement of the canine on the LLLT side at the end of both 4 and 8 weeks. There also was a positive co-relation between the increased tooth movement on LLLT side and increased levels of TRAP after the 3^{rd} day. ($p\text{-value} \leq 0.05$)

CONCLUSION: LLLT enhances the rate of orthodontic tooth movement which is also seen histologically by increased TRAP levels. This may be used as an aide to reduce treatment duration.