Biomarkers of orthodontic tooth movement and pain experienced during fixed orthodontic therapy in saliva: A systematic review

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Abstract

Background: Biomarkers are by definition objective, quantifiable characteristics of biological processes. The analysis of Saliva/ Salivary fluid may be an accepted way to examine the ongoing biochemical processes associated with bone turnover during orthodontic tooth movement and fixed orthodontic treatment pain. Pain and discomfort are fundamental in human existence during orthodontic treatment. If it is possible to biologically monitor and predict the outcome of orthodontic forces, then the management of appliances could be based on individual tissue responses, and the effectiveness of the treatment could be improved. Assessing pain objectively and the outcome of biomechanical therapy using salivary physiological biomarkers would benefit the clinician for appropriate pain diagnosis and management. Due to lack of standardized collection procedure, even though well accepted by patients, saliva is often neglected as a body fluid of diagnostic and prognostic value.

Methodology: A literature search was carried out in major databases such as PubMed, Medline, and Cochrane library, Web of Science, Google Scholar, Scopus and EMBASE for relevant studies. Publication in English between 2000 to 2019 which estimated Saliva markers as indicators of orthodontic tooth movement will be included.

Results: The list of biomarkers available to date was compiled and will be presented in presentation and table format. Each biomarker will be discussed separately based on the available and collected evidences.

Conclusion: Several sensitive salivary biomarkers are available to detect the biomechanical changes occurring during orthodontic tooth movement and pain occurring during fixed orthodontic therapy. Further focussed research might help to analyse the sensitivity and reliability of these biomarkers or cytokines, which in turn can lead to the development of chairside tests to assess the pain experienced by patients during orthodontic therapy and finally the outcome of the fixed orthodontic therapy.

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Biography:

Sagar S Bhat has completed his Bachelor of Dental Surgery (BDS) at the age of 23 years from The Oxford Dental College and Hospital, Bengaluru, Karnataka, India and currently pursuing his Postdoctoral degree or Master of Dental Surgery (MDS) in Orthodontics and Dentofacial Orthopaedics speciality at Department of Orthodontics and Dentofacial Orthopaedics, S D M College of Dental Sciences and Hospital, Dharwad - 580009, Karnataka, India.