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Ziyad S Haidar et al., Dentistry 2017, 7:6(Suppl)
DOI: 10.4172/2161-1122-C1-017

24th World Congress on

Dentistry and Oral Health

June 12-13, 2017 London, UK

Leukocyte and platelet-rich fibrin in oro-maxillo-facial surgery: Safety, efficacy and clinical protocol recommendations from randomized controlled clinical trials

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Objectives: Leukocyte and Platelet-Rich Fibrin (L-PRF) is a 3-D autogenous biomaterial obtained via the simple and rapid centrifugation of whole blood patient samples, in the absence of anti-coagulants, bovine thrombin, additives or any gelifying agents. A relatively new "revolutionary" step in second generation platelet concentrate-based therapeutics, the clinical safety more so, efficacy and effectiveness of L-PRF remains highly-debatable, whether due to preparation protocol variabilities, limited evidence-based scientific and clinical literature and/or inadequate understanding of its bio-components. This critical review provides an update on the application and clinical potential/effectiveness of L-PRF during oral surgery procedures, limited to evidence obtained from human Randomized and Controlled Clinical Trials. Recent functional recommendations on L-PRF preparation protocols are provided to the interested clinician as well as the involved researcher.

Data: All available/accessible clinical trials.

Sources: PubMed (from Jan 2014 – Feb 2016).

Study Selection: Eligibility criteria included: "Human Randomized Controlled Clinical Trials" and "Use of Choukroun's classic L-PRF preparations only".

Conclusions: Autologous L-PRF is often associated with early bone formation and maturation; accelerated soft-tissue healing; and reduced post-surgical pain, edema and discomfort. Preparation protocols require revision and standardization. Well-designed RCTs (according to the CONSORT statement) are also needed for validation. Furthermore, a better analysis of rheological properties, bio-components and bioactive function of L-PRF preparations would enhance the cogency, comprehension and therapeutic potential of the reported findings or "observations"; a step closer towards a new era of "super" dental bio-materials and -scaffolds.

Clinical Significance: L-PRF is a simple, malleable and safe biomaterial suitable for use in oral surgery. An innovative tool in Regenerative Dentistry, L-PRF seems a robust and possibly a cost-effective biomaterial alternate for oro-dental tissue repair and regeneration.

Biography

Ziyad S. Haidar D.D.S., Cert Implantol, M.Sc. OMFS, MBA, Ph.D. Research Professor and Scientific Director, Faculty of Dentistry, Universidad de los Andes, Santiago de Chile; is a dentist (DDS, AUST, UAE), oral implantologist (Cert Implantol UMDNJ, USA), oral and maxillofacial surgeon (M.Sc., McGill U, CANADA) and Health Care Organization Management Specialist (MBA, JMSB, CANADA) with a doctorate (Ph.D., McGill U, CANADA) in biomaterials, drug delivery and tissue engineering, followed by post-doctoral training at the Shriners Hospital, McGill University Health Center, Montreal, Canada. He is the Founder and Head of the Biomaterials, Pharmaceutical Delivery and Cranio-Maxillo-Facial Tissue Engineering Laboratory and Research Group (BioMAT'X), a newly-established R&D&I unit within the expanding Centro de Investigación Biomédica (CIB) and Facultad de Odontología, Universidad de los Andes in Santiago de Chile. Ziyad is also a Faculty member in the Ph.D.

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