Colgate

IADR
International Association for Dental Research
Australian/New Zealand Division

Inequalities to Personalized Medicine: A Tale of Disparities

Programme and Abstract Book

54th Annual Scientific Meeting

of the International Association for Dental Research

Australian & New Zealand Division

28th September – 1st October 2014

Brisbane Convention & Exhibition Centre

Brisbane, Australia

www.iadranz.org.au

inflammatory response of the host, resulting in unsatisfactory clinical outcomes when using the currently available therapeutic approaches.

Method: Using cell signalling manipulation methods and developing cell signalling activation biomaterials, periodontal cells can be differentiated in vitro and in vivo (periodontal defect model) to cementoblasts and osteoblasts to regenerate periodontal tissues

Result: In a recent study we have shown that cementum is incapable of repair without proper intervention and we were able to demonstrate robust cementum repair and regeneration mediated via the activation of Wnt/β-catenin signalling pathway on the root surface. We further showed that a novel bioscaffold, with properties that enhance Wnt/β-catenin signalling, was able to induce osteogenic/cementogenic differentiation of human periodontal ligament cells (hPDLCs). These findings are particular relevant in terms of periodontal tissue regeneration, in which the ultimate aim is to repair and regenerate the damaged periodontal structures, including the cementum, periodontal ligament and alveolar bone. Considering the complex three dimensional environment of the tooth, we found that the Wnt/β-catenin signalling pathway provide important cues to hPDLCs, which then adapt to the nature of the bone-periodontal ligament-cementum complex and differentiate into location specific cell lineages.

Conclusion: This study demonstrated the role of the Wnt/β-catenin signalling pathway in periodontal tissue regeneration and its application in the treatment and management of periodontitis.

193641

Cytotoxicity Of Various Bisphosphonates On Human Umbilical Cord-Derived Stem Cells

C.G.D. SHARMA, Griffith University, Griffith Health Institute, Southport, Australia, S. HAMLET, Griffith University, Southport, Australia, E. PETCU, Griffith University School of Medicine, Griffith Health Institute, Southport, Australia, and S. IVANOVSKI, Griffith University, Gold Coast, QLD, Australia

Objective: Bisphosphonates (BPs) are a group of drugs primarily used to prevent bone resorption in a variety of clinical situations including osteoporosis, Paget's disease and invasive malignancy- related bone resorption. BP use has been associated with osteonecrosis of the jaw (BRONJ and the biological mechanisms leading to this condition are not fully understood. This in vitro study aimed to evaluate the effect of different classes of BPs (non-nitrogen containing clodronate, and the nitrogen containing BPs alendronate and zoledronate) on human umbilical cord-derived stem cells (UCSCs).

Method: UCSCs were cultured in-vitro with clodronate, alendronate and zoledronate at 0.25μM, 0.5μM**,** 1μM, 2μM and 3μM in culture media for 10 days and an Alamar Blue assay was conducted to assess the effects of the drugs on cell proliferation. To assess the cytotoxicity of the drugs, live/dead staining was used at 24 and 48 hours' time point. Further, to evaluate the effects of these drugs on cell migration, scratch wound healing assays were conducted at 6 and 24 hours.

Result: All of the BPs tested were found to negatively affect UCSC cell proliferation with the lowest effect shown by clodronate (0.25 μM) and the highest with zoledronate at 5 μM concentration. Live/dead staining also revealed a similar trend with the high potency drug zoledronate causing the highest cytotoxicity. Further, the scratch wound healing assay showed that zoledronate significantly inhibited cellular migration at both time points compared to minimal or no effect of clodronate at any concentration.

Conclusion: The non-nitrogen containing BPs are less cytotoxic and have minimum inhibition of proliferation and migration of UCSC as compared to the more potent nitrogen-containing BPs alendronate and zoledronate.

193716

Fluconazole Resistance Against Oral Candida in Patients Taking Antipsychotic Drugs

W.S. MOHAMED THANI, E. MACFADYEN, A.M. RICH, and R.D. CANNON, Sir John Walsh Research Institute, University of Otago, Dunedin, New Zealand

Objective: To determine the Candida species present and colonisation level of the oral mucosa in people taking antipsychotic drugs relative to healthy individuals and other xerostomic patients. To investigate Candida resistance to fluconazole and antispsychotics, as the antipsychotic fluphenazine is known to induce fluphenazine resistance in Candida albicans.

Method: Consented participants aged between 20 to 70, who were on antipsychotic drugs were enrolled. Xerostomia symptoms were determined from the Xerostomia Inventory (XI) and from clinical examinations. Saliva rinses were collected and smears were taken from the buccal mucosae and tongue, and other suspicious mucosa. Smears were examined for candida hyphae and yeast identification. Saliva samples were plated onto Chromagar Candida agar plates, and incubated at 37°C for 48 hours. The colony-forming units (CFU) and species (from the colony colour) were recorded. The susceptibility of C. albicans isolates towards fluconazole was measured using the E-test according to the manufacturer's instructions

Result: Current findings showed that although 75% of participants had evidence of dry mouth clinically, they did not neccessarily have symptoms (only a third had high