

Report of “Research Award of Oral Sciences”

Department: Department of Orthodontics and Dentofacial Orthopedics

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Title: “Combined therapeutic effects of parathyroid hormone and low-intensity pulsed ultrasound enhance bone fracture healing in osteoporotic rats.”

1. Aim of the research and results obtained: Osteoporosis is a progressive metabolic bone disease affecting over 10 million people in which bones become fragile and brittle leading to higher risk of fractures, than in healthy bone. It occurs when bones lose mineral components; more rapidly, leading to the reduction in bone thickness, density and mass.

Due to excessive bone resorption and deficient bone formation, osteoporotic bodies with fracture are subject to depressed callus quality and prolonged healing time, even nonunion or non healing of the bone. Recent evidences have indicated that two interventions have been found to enhance fracture healing, i.e. parathyroid hormone (PTH) and low-intensity pulsed ultrasound (LIPUS). PTH is the first anabolic drug approved by FDA; suggest that PTH might be beneficial in the treatment of fractures in human and normal animal model. Although PTH administration for osteoporosis is indicated for up to 24 months in human, its repeated use, high cost and the unpleasantness of daily subcutaneous injections, have become a concern. Therefore, finding the least possible duration of PTH treatment in combination with other anabolic agents such as LIPUS, is crucial.

We have demonstrated that the combined therapy of PTH and LIPUS leads to faster fracture healing and improved bone properties through enhanced bone volume and microarchitectural parameters compared to the non-combined treatment. These evidences implicate that the combined treatment of PTH and LIPUS might be useful in osteoporotic fracture healing.

2. Self evaluation of research achievement: I would like to express my appreciation and gratitude to the Tokushima University Graduate School of Oral Sciences for having selected me as one of the “Research Award of Oral Sciences” Bronze winner. Under the financial support of the Research Award of Oral Sciences, I presented my research on “Therapeutic Ultrasound in Dentofacial

Regeneration and Tissue Engineering Symposium” at the 45th Annual Meeting & Exhibition of the American Association of Dental Research (AADR), held in conjunction with the 40th Annual Meeting of the Canadian Association for Dental Research (CADR) in Los Angeles Convention Center, Los Angeles, California., USA.

3. Meeting presentation:

Combined therapeutic effects of parathyroid hormone and low-intensity pulsed ultrasound enhance bone fracture healing in osteoporotic rats. 45th Annual Meeting & Exhibition of the American Association of Dental Research (AADR), held in conjunction with the 40th Annual Meeting of the Canadian Association for Dental Research (CADR) in Los Angeles Convention Center, Los Angeles, California., USA. March 16-19, 2016. Karima Qurnia Mansjur. Oral Presentation at the “Therapeutic Ultrasound in Dentofacial Regeneration and Tissue Engineering Symposium”.