OSTEOPOROSIS AND STUDIES TOWARDS THE PREVENTION OF FRACTURES: MECHANICAL ANALYSIS AND BONE REGENERATION

Gerardo Presbítero¹, Juana Enríquez²

¹Faculty of Engineering, National Autonomous University of Mexico. University Centre for Advanced Technology (PUNTA-UNAM) at Monterrey, Mexico, 66629. ²Department of Reproductive Biology “Dr. Carlos Gual Castro”, National Institute of Medical Sciences and Nutrition Salvador Zubirán, Vasco de Quiroga 15, Mexico City 14000, Mexico.

It is planned the extreme necessity and importance to implement studies involving the application and validation of studies currently developed focused in the acceleration of bone formation process during bone remodeling, through the functional activation of osteoblasts in order to increase the mechanical properties of human bones. According to studies performed by our research group towards the analysis of the mechanical and biological properties of trabecular and cortical bone (Enríquez et al., 2013; Maciel et al., 2015; Presbitero et al., 2012), studies are developed to determine the effects that synthetic progestins have on the mechanical properties of bones with osteoporosis through microfractures developed and induced by fatigue. Osteoporosis represents one of the major public health problems in western world countries, and although osteoporosis is not considered until nowadays to be a serious disorder, more deaths are caused from osteoporotic fractures in women than the combined mortality of breast, cervical, and uterine cancer (Kanis et al., 1990). In addition, fractures of patients with osteoporosis are commonly caused by fatigue, while performing normal effort activities or under mild jogging, more than the impact of a fall (Cotton et al., 1994). Our research includes the use of studies over the effects of synthetic progestins and/or their derivatives on the mechanical properties of the trabecular and cortical bones with induced microfractures, proving the effectiveness of the treatment in order to establish the bases towards the prevention of fatigue fractures due to bone weakening, being a factor that acquires greater importance in population sectors with higher risk of developing osteoporosis.

Keywords: Osteoporosis, Bone fragility, Androstanediols

References:


Presenting author’s email: presbitg@unam.mx