PULSUS
WWW.PULSUSCONFERENCE.COM

J Orthop Trauma Surg Rel Res, ISSN: 1897-2276

13th International Conference on
ARTHRITIS AND RHEUMATOLOGY
&
3rd International Conference on
ANATOMY AND PHYSIOLOGY
December 9-10, 2019 | Barcelona, Spain

Humanin treatment, a potential new strategy to prevent bone growth impairment in chronic inflammatory disorders

Yunhan Zhao
Karolinska University, Sweden

Statement of the Problem: Children with chronic inflammatory conditions such as inflammatory bowel disease (IBD) often suffer from bone growth impairment which has been linked to increased levels of pro-inflammatory cytokines, including IL-1β and TNF-α, and treatment with high doses of glucocorticoids. Humanin is an endogenous anti-apoptotic protein which in preclinical studies has been shown to prevent glucocorticoid-induced bone growth impairment, without interfering with the desired anti-inflammatory effects of glucocorticoids. We hypothesized that systemic levels of humanin are decreased in growth retarded children with inflammatory bowel disease (IBD) and that treatment with a humanin analogue (HNG) can prevent cytokine-induced bone growth impairment.

Methodology & Theoretical Orientation: Humanin levels were measured by ELISA in serum samples obtained from 40 short children with IBD and in gender-matched healthy controls. Ex vivo cultured fetal rat metatarsal bones were treated with the pro-inflammatory cytokines IL-1β plus TNF-α (10 ng/ml each) and/or HNG (300 ng/ml) while bone growth was followed for 12 days.

Findings: Serum humanin levels were significantly decreased in the IBD patients when compared to healthy controls ($p < 0.01$). The cytokines TNF-α and IL1-β acted in synergy to suppress metatarsal bone growth ($p < 0.001$ vs control) and this effect could be partly prevented when co-cultured with HNG ($p < 0.01$ vs cytokines only).

Conclusion & Significance: Our data suggests that systemic levels of humanin are decreased in patients with chronic inflammation who suffer from bone growth impairment. Interestingly, the human analogue HNG was found to partially prevent cytokine-induced growth impairment in ex vivo cultured rat metatarsal bones. Our findings suggest that humanin is a potential drug target for the prevention of bone growth impairment in conditions of chronic inflammation.

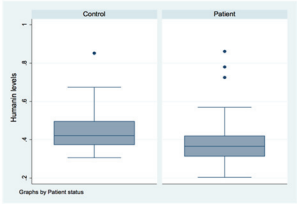

Fig. 1 Humanin levels are significantly suppressed in IBD patients (p<0.01, n=40). Serum taken from IBD patients (Laakso, Valta et al. 2012) already known to have decreased BMD, were analyzed for humanin levels by using ELISA.

Biography

Yunhan Zhao is a PhD student from Karolinska Institutet. His project is on Prevention of growth failure and osteoporosis in chronic inflammation. The aims of his studies are to explore the molecular mechanisms of GC-induced growth failure and osteoporosis, and to investigate the potential for humanin analogues, in combination with GCs to prevent osteoporosis and bone growth failure in inflammatory diseases.

yunhan.zhao.1@ki.se