

Conclusions: Higher Stiffness, higher Failure Load and higher Apparent Modulus mean better resistance to deforming forces. Crude comparison indicated AIS was associated with lower Stiffness, lower Failure Load and lower Apparent Modulus. Analysis with Model 1 showed that the difference in Stiffness was due to confounding from age. Further analysis with Model 2 indicated the difference in Failure Load could arise from difference in calcium intake and physical activity level between AIS and controls. Notably AIS remained associated with lower Apparent Modulus after adjusting for age, calcium intake and physical activity level. This indicated the presence of an underlying biochemical or biomechanical mechanism yet to be identified. Further studies on this area are warranted in order to gain in-depth understanding of the nature of low bone mass and bone strength and their roles in the pathogenesis of AIS.

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SERUM VITAMIN D LEVEL CAN AFFECT THE TREATMENT OUTCOME OF WHOLE-BODY VIBRATION (WBV) FOR OSTEOPENIA IN GIRLS WITH ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS)

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Introduction: AIS was associated with osteopenia. Our randomized controlled trial(RCT) showed anabolic bone effects of WBV at the convex leg in AIS subjects. Our objective was to evaluate the role of Vit-D in modulating the treatment effect of WBV.

Materials and methods: This was nested within the above mentioned RCT on 122 AIS girls with BMD Z-scores < -1. They were randomly allocated to the Treatment or Control group. The Treatment group stood on a low-magnitude high-frequency WBV platform 20 mins/day, 5 days/week for 1 year. aBMD at femoral neck (FNaBMD) was measured with Dual-energy X-ray Absorptiometry at baseline and at 12-month. Serum 25(OH) Vit-D level was measured at 6-month.

Results: The mean age was 17.8(SD=1.5) years old. For those with serum 25(OH)Vit-D>40nmol/L, positive effects of WBV were greater at both sides with treatment effects also noted at the concave leg. The positive correlation between serum 25(OH)Vit-D and percentage increase in FNaBMD that was not present in the Control group was explicitly detectable in the Treatment group at the concave leg(p=0.033).

Discussion and Conclusion: The results strongly suggested the treatment effect of WBV could be enhanced by Vit-D and that Vit-D insufficiency could affect negatively the treatment outcome of WBV for osteopenia in AIS girls. Funding Source: GRF of RGC HK(Project no: 467808).

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VITAMIN D STATUS AND ITS CORRELATION WITH BONE MINERAL DENSITY IN GIRLS WITH ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS)

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Introduction: AIS is associated with osteopenia and raised bALP. The prevalence of AIS correlated with latitudes of geographical regions. AIS

could be associated with abnormal Vit-D physiology. Our aims were to evaluate Vit-D status and its correlation with aBMD in AIS and controls.

Methods: 212 AIS girls and 183 age and gender-matched normal controls were recruited. Serum 25(OH)Vit-D was measured with Liquid-chromatography Tandem-mass-spectroscopy and aBMD at femoral necks was measured with Dual-energy X-ray Absorptiometry.

Results: The mean 25(OH)Vit-D levels for AIS and controls were 41.6±14.4 and 39.5±11.5 nmol/L respectively(p=0.103). Using multivariate linear regression model to adjust for age, body weight, armspan, season, physical activity and dietary calcium intake levels, the p-value on the correlation between aBMD and 25(OH)Vit-D level for the right and left side for controls were 0.055 and 0.047, and that for AIS were 0.804 and 0.466 respectively.

Discussion and Conclusions: AIS and Control group had suboptimal 25(OH) Vit-D levels. The positive correlation between 25(OH)Vit-D and aBMD seen in controls was not present in AIS subjects, thus indicating the possibility of Vit-D resistance in AIS. Whether this is responsible for osteopenia that characterizes AIS and how this is related to the pathogenesis of AIS warrant further studies.

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THE EFFECT OF ENOXACIN ON BONE MINERAL DENSITY AND REDUCTION OF TITANIUM PARTICLE-INDUCED OSTEOLYSIS VIA SUPPRESSION OF JNK SIGNALING PATHWAY

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Objective: The aim of this study was to assess the effect of enoxacin on bone mineral density and titanium particle-induced osteolysis. Wear particles liberated from the surface of prostheses are associated with aseptic prosthetic loosening. It is well established that wear particles induce inflammation, and that extensive osteoclastogenesis plays a critical role in peri-implant osteolysis and subsequent prosthetic loosening. Therefore, inhibiting extensive osteoclast formation and bone resorption could be a potential therapeutic target to prevent prosthetic loosening.

Methods: In this study, we demonstrated that enoxacin, a fluoroquinolone antibiotic, exerts potent inhibitory effects on titanium particle-induced osteolysis in a mouse calvarial model.

Results: Interestingly, the number of mature osteoclasts decreased after treatment with enoxacin in vivo, suggesting that osteoclast formation might be inhibited by enoxacin. We then performed in vitro studies to confirm our hypothesis and revealed the mechanism of action of enoxacin. Enoxacin inhibited osteoclast formation by specifically abrogating RANKL-induced JNK signaling.

Conclusion: Collectively, these results suggest that enoxacin, an antibiotic with few side effects that is widely used in clinics, had significant potential for the treatment of particle-induced peri-implant osteolysis and other diseases caused by excessive osteoclast formation and function.

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ASSOCIATION BETWEEN VITAMIN D GENE RECEPTORS POLYMORPHISMS, SECONDARY HYPERPARATHYROIDISM, AND STRUCTURAL-FUNCTIONAL STATE OF BONE TISSUE IN POSTMENOPAUSAL WOMEN

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Introduction and aims: To determine the association between vitamin D gene receptors polymorphisms, secondary hyperparathyroidism, and structural-functional state of bone tissue in postmenopausal women.

Materials and methods: The study involved 178 postmenopausal women (the average age - 57.0±1.2 yrs.). The VDR Bsm I region genotypes were determined by polymerase chain reaction-restriction fragment length polymorphism. BMD was measured by ultrasound densitometry of calcaneus by SAHARA (Hologic). 25(OH)D and iPTH in plasma were determined by using the Elecsys electrochemiluminescence immunoassay system.

Results: Genotype bb was found in 48 % of women and 37.6 % and 14.4% of women had genotype Bb and genotype BB, respectively. It was found that the genotype Bb was associated with the lowest incidence of osteoporosis (7.4 % vs. 22.1% with genotype bb) and fractures (23.1 % vs. 29.2% with genotype BB). Women with genotype bb recorded a high percentage of osteoporosis (22.1%) and women with genotype BB a high percentage of fractures (29.2%).