

**E-Poster #32**

\*\*JOHN H. MOE AWARD NOMINEE FOR BEST BASIC SCIENCE PRESENTATION

**A Study on the Effect of Melatonin Toward the Proliferation and Differentiation of Osteoblasts in Adolescent Idiopathic Scoliosis**

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**Introduction:** Low BMD has been clinically reported in AIS patients. Suggestions been made that the dysfunction of MLT signaling pathway might be the key to the spinal deformity in AIS patients. Based on prior studies, MLT has shown to influence and regulate skeletal growth and bone formation in both human and rats. However, there is a lack of direct evidence on the role of MLT on AIS. Hence, we would like to investigate the effect of MLT on AIS bone cells at the cellular level.

**Methods:** In vitro assays were performed with osteoblasts isolated from 7 female patients with severe AIS and 7 normal controls. The osteoblasts were treated with different concentration of MLT (0, 10<sup>-11</sup>, 10<sup>-9</sup>, 10<sup>-7</sup>, 10<sup>-5</sup>M). The effect of the treatment in cell proliferation was tested by MTT cell viability assay. As for the effect of MLT on osteoblasts differentiation, cells were cultured overnight in osteogenic medium. Then, they were given different concentration of MLT for 3 days, prior to measuring the alkaline phosphatase activity. Moreover, the mineralization of the matrix was determined by qualitative analysis of the alizarin red S staining after 18 days of culture.

**Results:** There was a significant difference between the control and the AIS at the MLT concentration of 10<sup>-9</sup> to 10<sup>-5</sup> M (p<0.05). In the control, MLT could stimulate the osteoblasts to proliferate when compared with the basal level (p<0.05). Likewise, MLT could also enhanced differentiation in these cells, with incubation overnight in osteogenic medium (p<0.05). The cells were also found to form mineralized matrix. In contrast, none of the osteoblasts from AIS could shown any of the changes when the same concentration of MLT is added.

**Conclusion:** For the very first time, we have demonstrated that there is a relative difference between the AIS and the normal osteoblasts in response to MLT. This may account for the observation of low BMD and abnormal growth which may play an important role in the etiopathogenesis of AIS.