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974 Morphological analysis of maxillary deformity in Id2 KO mice

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Presentation Type: Poster Session

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Objectives: Disharmony in maxillofacial morphogenesis may result in jaw deformity which affected 5% of population. Literatures have suggested a relationship between jaw deformity and environmental as well as genetic factors. Inhibitors of differentiation (Id) proteins, which belong to the family of basic helix-loop-helix (HLH) transcription factors, modulate cell proliferation, apoptosis and differentiation. This study aimed to explore the mechanism of maxillary deformity, using a sample of Id2 knocked out (KO) mice. **Methods:** Appropriate ethic approval has been received. Morphometric analysis with a micro - computer tomographic technology was applied. Cranial base synchondroses of mice in Postnatal Week 0, 2 and 12 were examined with a histological approach by H&E staining, Alizarin red and Alcian blue staining, BrdU-specific staining and TUNEL staining. The expression of Id2 in the synchondroses was evaluated by semiquantitative RT-PCR technique and section in situ hybridization. The synchondroses were further cultured using a serum-free organ culture system supplemented with BMPs. **Results:** In Postnatal Week 0, Id2 KO and wild type (WT) mice did not differ in morphometric results and histological findings of cranial base synchondroses. In Postnatal Week 2, a narrower hypertrophic zone and an inhibited proliferative zone in presphenoid synchondrosis and sphenoccipital synchondrosis of Id2 KO mice were identified in addition to the maxillary hypoplasia. Expression of the Id2 gene in cranial base synchondroses was confirmed. Exogenous BMPs enhanced cartilage growth, matrix deposition and chondrocyte proliferation in WT other than KO mice. **Conclusion:** Deficiency in the Id2 gene resulted in an incorrect BMPs signal transduction. This contributed to abnormality of endochondral ossification in cranial base synchondroses during the growth period. Consequently, maxillary deformity occurred.

Keywords: Chondrocytes, Cranial base, Formation, Gene expression and Proteins

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