**Expression of Vitamin D Receptor (VDR) responsive genes in paravertebral muscles of Juvenile and Adolescent Idiopathic Scoliosis**

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**INTRODUCTION:** VDR may be considered as a candidate gene related to Idiopathic Scoliosis susceptibility and natural history. VDR regulates 0,5-8% of total genome, and appears to be involved in a variety of cellular functions. The age of scoliosis onset in a large extent determines its epidemiology, natural course and response to the treatment. It is also possible that some of these differences could be related to the expression of VDR responsive genes in paravertebral muscles.

**OBJECTIVES:** Evaluation of differences between the muscular tissue transcriptomes harvested from curve concavity and convexity in JIS and AIS. Identification of the VDR responsive genes in paravertebral muscular tissue that could differentiate Juvenile and Adolescent Idiopathic Scoliosis

**METHODS:** During scoliosis surgery specimens of paravertebral muscles were harvested at both sides of the curve apex from 9 female patients (5 JIS and 4 AIS), average age was 17,9. Frontal and sagittal Cobb angles were $67,3^0$ and $37^0$ respectively. 14 RNA samples, 7 from curve concavity (M1) and 7 from curve convexity (M2) were subjected for transcriptome analysis with HG U133A microarray chips (Affymetrix). Tissue samples preparation and microarray processing was performed according to Affymetrix Gene Expression Analysis Manual. Fluorescence intensity was measured with the use of Agilent Gene Array Scanner G2500A. Analyzed paravertebral muscles transcriptomes were grouped according to the side of the curve and age of the scoliosis onset.Statistical analysis was performed with the use of GeneSpring 11GX application. Matrix plot of normalized log-intensities served to visualize the differentiation between muscular tissue transcriptomes from curve concavity and convexity and between both groups. Based on Affymetrix Net Aff database out 75 mRNA probes of VDR responsive genes were selected. Identification of VDR responsive genes differentially expressed in JIS and AIS was performed by Fold Change Analysis,FC 2 assumed significant. The results were visualized by scatter plots.

**RESULTS:** Matrix plot analysis of the transcriptomes visualized higher degree of differentiation between transcriptomes from curve concavity and convexity in JIS. This observation could be related with the higher progression potential of the curves with earlier onset. Matrix plot analysis permitted also to localize higher differentiation of the transcriptomes between Juvenile and Adolescent Idiopathic Scoliosis group at the curve concavity. This observation might suggest paravertebral muscles of curve concavity as a potential target of future molecular research.FC analysis permitted to identify Tob2 and MED13 as VDR responsive genes differentially expressed in Juvenile and Adolescent Scoliosis group in muscular tissue of curve concavity. Both genes were up regulated in Adolescent Scoliosis group. Tob2 was also differentially expressed at the curve convexity and was be up regulated in Juvenile Idiopathic Scoliosis.

**CONCLUSION:** Compared to Adolescent Idiopathic Scoliosis paravertebral muscles transcriptomes of Juvenile Idiopathic Scoliosis present higher degree of differentiation. In paravertebral muscles, out of the 75 VDR responsive genes, Tob2 and Med13 genes differentiate Adolescent and Juvenile type of Idiopathic Scoliosis

**Disclosure of Interest**: None Declared

**Keywords**: Idiopathic Scoliosis, paravertebral muscle microarray analysis, vitamin D responsive genes