#2627 - Experimental Study / Posters

The Proteomic Comparison Of Medial And Lateral Soft-Tissue Of Clubfoot

Orthopaedics / Paediatric Orthopaedics / Foot

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Background
Idiopathic pes equinovarus (clubfoot) is a congenital deformity of the foot feet and lower legs. It is one of the most common birth defects (1-2/1000) affecting the musculoskeletal system. In general, clubfoot belongs to a group of fibro-proliferative disorders but its origin and multi-hierarchical effect remains unknown.
Objectives
A number of hypotheses have been proposed to explain clubfoot etiology, including vascular deficiencies in the talus, environmental factors, in utero poisoning, abnormal muscle insertions, and genetic factors. Recently, it was agreed that clubfoot is multifactorial in origin and the etiology of this disease is not fully clear. Undoubtedly, genetics plays a significant role which is illustrated by the familial pattern of inheritance coupled to a 32.5% concordance between monozygotic twins. Although the exact genetic mechanism of clubfoot is yet to be elucidated, a multifactorial and possibly polygenic causation has been suggested.
Study Design & Methods
In this study, we compared concentration of proteins between clubfoot affected (very stiff) soft tissue, i.e. the medial side of the foot (n=16), to non-affected soft tissue, i.e. the lateral side (n=13). We used label-free mass spectrometry and immunohistochemistry for this study.
Results
1) There Significant differences in protein composition were found detected in clubfoot deformity between the significant differences in protein composition of affected (medial) and non-affected (lateral) aspect part of the foot in clubfoot deformity.
2) Twelve proteins were detected to be upregulated in the medial side and four in the lateral side of clubfoot.
3) Specific calcifications were observed in connective tissue of affected (medial) aspect part of food foot in clubfoot deformity.

Conclusions
Compared Clubfoot tissues from the medial and lateral sides of the foot have different composition of proteins between medial and lateral side (comprising both in extracellular and intracellularextracellular proteins space). Most of the differently expressed proteins have a strong relationship to the physiological development of extracellular matrix architecture and therefore can be assumed to play a highly significant role in the pathological process of the clubfoot disease. These proteins seem to be promising targets for future investigation

and/or treatment of this disease. Moreover, specific signs of soft tissue dystrophy (isolated calcified structures) were detected in the medial sidte of clubfoot for the first time. Our results offer the first comparative protein comparison expression profile of clubfoot tissues , leading to the identification and bring new possible protein targets and contribute to the search for the possible etiology of this pathological deformity.