Abstract

Alpha-dystroglycanopathies are inherited autosomal recessive diseases belonging both to the group of hereditary muscular dystrophies and the congenital disorders of glycosylation. Currently there are 20 genes of which are known to lead to this disease.

Alpha-dystroglycan is a membrane protein which is at its mucin domain posttranslationally modified with oligosaccharide chains *O*-glycosidically bound via mannose. Defective biosynthesis of oligosaccharide chains leads to hypoglycosylation of alpha-dystroglycan, which loses its ability to bind to the laminin *G*-domain of ligands in extracellular matrix. This hypoglycosylation leads to the group of diseases called alpha-dystroglycanopathies.

The most severe forms of alpha-dystroglycanopathies manifest with muscular dystrophy, ocular malformations and defects of central nervous system. Milder forms of this disorder may manifest only with muscular dystrophy without other clinical symptoms.

Diagnosis of alpha-dystroglycanopathy is difficult due to the lack of standardly available biochemical methods, which would facilitate the targeting of the investigation process before molecular genetic analysis.

The aim of the present study was to provide an overview of alpha-dystroglycanopathies focusing on the structure, alteration and pathology of alpha-dystroglycan. In the experimental part of this thesis, immunoelectroforetic techniques were experimentally used to facilitate diagnosis in two patients (P1, P2) with clinical suspicion of alpha-dystroglycanopathy. Hypoglycosylation of alpha-dystroglycan was confirmed in both pacients. In P2 the defect was caused by mutations in the gene *LAMA2* important for the synthesis of laminin and in P1 most likely by one of the genes causing alpha-dystroglycanopathy whose identification is a matter for further analysis.

Key words: Alpha-dystroglycanopathy, alpha-dystroglycan,immunodetection, diagnosis, Congenital disorders of glycosylation