8. CLINICAL AND GENETIC ASPECTS OF PROGRESSIVE MUSCULAR DYSTROPHIES IN CHILDREN

Author: Semeniuc Mihai

Scientific adviser: Mariana Sprincean, PhD, Associate Professor, Department of Molecular Biology and Human Genetics, *Nicolae Testemitanu* State University of Medicine and Pharmacy of the Republic of Moldova.

Introduction. In children, Progressive Muscular Dystrophies (PMD) are a wide group of genetic diseases which affect skeletal muscles by progressive weakness and degeneration, caused by genetic alterations. In some cases, involvement is not limited to muscles, but it may influence other organs, such as heart and respiratory muscles. This category of pathologies causes progressive weakness and loss of muscle mass. In muscular dystrophy, abnormal genes (mutations) interfere with the production of proteins needed to form healthy muscles. Histologically, Progressive Muscular Dystrophies are unified by the presence of necrotic and regenerating processes, related with an increased amount of connective and adipose tissues.

Aim of study. Elucidation and comprehensive overview of the clinical and genetic aspects of progressive muscular dystrophies in children.

Methods and materials. The presented work was created on the basis of review of literature exploring bibliographic sources, using manuals and articles published in databases: PubMed, Google Scholar, Medscape, NCBI, ScienceDirect.

Results. The analysis and synthesis of literature and bibliographic sources show the existence of many types of progressive muscular dystrophies. There are at least 16 different types of PMD in children. All of them are genetically determined diseases of the muscles which lead to progressive weakness. According to the mode of transmission, Progressive Muscular Dystrophies are classified in the following types (David Gardner-Medwin MD FRCP classification): X-linked recessive muscular dystrophies: - Duchenne muscular dystrophy (severe type); - Becker muscular dystrophy (benigne type); - Benign muscular dystrophy with early contractures; - Scapulo-peroneal muscular dystrophy (Emery-Dreifuss); X-linked dominant muscular dystrophies: - Hereditary myopathy in females; Autosomal recessive muscular dystrophies: - Scapulohumeral (limb-girdle) muscular dystrophy: LGMD2A-2W - Quadriceps myopathy; - Childhood hereditary autosomal recessive myopathy; - Congenital muscular dystrophy; - Adult distal muscular dystrophy: Nonaka, Miyoshi - Oculopharyngeal muscular dystrophy; Autosomal dominant muscular dystrophies: - Scapulo-peroneal autosomal dominant muscular dystrophy; - Late-onset proximal autosomal dominant muscular dystrophy; – Facioscapulohumeral muscular dystrophy (Landouzy-Dejerine). All these types are distinguished based on some specific genetic mutations unique for each type of PMD characterised by a different pattern of muscle distribution, different involvement of skeletal muscles, body organs and variable course of evolution. The most important and frequent PMD are Duchenne progressive muscular dystrophy (DMD) and Becker progressive muscular dystrophy (BMD). These are some of the most severe forms of progressive muscular dystrophies in children. Nowadays, there is no effective treatment for DMD/BMD and other PMD. Despite significant progress of molecular biology and genetics that has been achieved over the last two decades in this domain, prevention, carrier detection, counselling, and prenatal diagnosis remain the only effective strategies against these pathologies.

Conclusion. Progressive Muscular dystrophies (PMD) represent a collective group of inherited non-inflammatory but progressive muscle disorders with many phenotypic characteristics, which are difficult to diagnose in the early stage of the disease. Elucidation of clinical and genetic aspects are essential for prevention, establishment of an accurate diagnosis, genetic counselling of families in the high-risk group and prenatal diagnosis for prophylaxis. It is important to know the clinical and laboratory aspects in PMD to detect these diseases as early as possible and to apply therapeutic protocols in order to increase life expectancy, thus improving the quality of these patients' lives and of their families.