The Role of Physiotherapy in Improving Muscle Strength and Motor Milestones in Duchenne and Becker Muscular Dystrophy and Their Prevalence in El-Mergib Province

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ABSTRACT

Background:

Muscular dystrophies are inherited group of disorders leads to gradual weakness and degeneration of muscles, especially skeletal and cardiac muscle. There is a variety of muscular dystrophies. Duchene (DMD) and Becker muscular dystrophy (BMD) are the most common forms after myotonia. Physiotherapy and rehabilitation maintain function, delay disability, and reduce discomfort. Therefore, it's still playing a role, but outcomes unfold over a longer timeline.

Aim of the work:

Is to provide insights into the prevalence of muscular dystrophy in our society and to evaluate the improvement after the physiotherapy programs for these patients.

Materials and Methods:

A cross-sectional survey was conducted from 2020 to 2025. Data collected from parents with children who attended the physiotherapy department. After explaining the purpose and details, those who agree to participate were interviewed face to face and a prepared questionnaire used after modification to reflect custom and practice in our society was completed with parents for each child with diagnostic code for muscular dystrophy.

Data was processed using the software Statistical Package for Social Science.

Results:

The collected cases (16) were divided into two equal (8) groups according to the diagnosis. The DMD 3 females & 5 males and BMD group 4 females and 4 males, the mean age was (48.5±33.7, 69±34.9) month,

mean duration of Physiotherapy was (3.25±1.58, 4.5±2) years and functional improvement was about (25±4.6, 30±5.9) respectively.

Conclusion:

The study shows benefits of physiotherapy in these disorders; improvement reached to 35% in BMD. Also provides insights into prevalence of DMD and BMD however; further studies with larger sample sizes are needed to confirm these findings

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Introduction: Muscular dystrophies are a group of genetic conditions causing progressive skeletal muscle weakness [1]. Among the most prominent forms are Duchenne Muscular Dystrophy (DMD) and Becker Muscular Dystrophy (BMD), which together represent a significant pediatric and adult neuromuscular challenge. DMD is a severe, early-onset X-linked disorder affecting approximately 1 in every 3,500 to 5,000 live male births, typically diagnosed around 2–3 years of age [2, 3]. In contrast, BMD is a milder, later-onset variant affecting roughly 1 in 18,000 to 30,000 live male births, characterized by slower progression where heart failure serves as the most common cause of death.[4]

Both are X-linked diseases caused by dystrophin-related genetic changes. Although there is currently no cure, multidisciplinary care can significantly influence function, comfort, and quality of life. Physiotherapy is crucial, aiming to slow functional decline, maintain comfort, preserve mobility, and prevent complications. Safe dosing—rather than maximal effort—is essential to achieve the best therapeutic outcomes [5, 6]. Consistent findings indicate that physiotherapy helps preserve the range of motion and reduces contracture severity [7], while mitigating discomfort, pressure issues, and postural instability [8]. Furthermore, early and progressive physiotherapy supports respiratory muscle function and airway clearance efficiency [9-11].**Aims of the work:** The study aimed to provide insights into the prevalence of muscular dystrophy in our society and to evaluate the improvement after the physiotherapy programs for these patients.

Methods: This study employed a cross-sectional survey design, conducted between 2020 and 2025. Data were collected from 16 parents of children with muscular dystrophy who attended the physiotherapy department. After the purpose and details of the study had been explained to them, parents who agreed to participate were interviewed face to face. A prepared questionnaire, modified to reflect the customs and practices of our society, was completed with each parent for each child with a diagnostic code for muscular dystrophy. The questionnaire assessed parental beliefs about the cause of muscular dystrophy and their perceptions of the benefits of physiotherapy (that is, parents' feelings toward physiotherapy). It should be noted that this study is an initial, exploratory one.

Results: The collected cases in this study were 16 (table 1&2) divided into two groups according to the diagnosis. All values are expressed in mean ± standard deviation (SD). The DMD group 3 females & 5 males, the mean age was 48.5 ± 33.7months, mean duration of Physiotherapy was 3.25 ± 1.58 years and functional improvement was about 25 ± 4.6. The BMD group was 4 females & 4 males, the mean age was 69±34.9 months, mean duration of physiotherapy was 4.5±2 years and functional improvement was about 30±5.9.

Table (1): showing distribution by the number of cases (No.) and percentage (%), according to the sex, type of disease, and age.

		No.	***%***
Sex	Female	7	43.7%
	Male	9	56.3%
DMD (8)	Female	3	37.5%
	Male	5	62.5%
BMD(8)	Female	4	50%
	Male	4	50%
Age	≤3 years	5	31.23%
	3-6 years	6	37.5%
	> 6 years	5	31.25%

Table (2): showing mean age in months ± SEM, mean duration of physiotherapy in years ± SD, mean functional improvement ± SD in DMD and BMD.

Type of muscular dystrophy	Mean Age in Months ± SD	Mean duration of Physiotherapy in Years ± SD	Mean functional improvement ± SD
DMD	48.5±33.7	3.25±1.58	25±4.6
BMD	69±34.9	4.5±2	30±5.9

Discussion: A better understanding of the prevalence and age of onset of DMD and BMD is crucial because this knowledge can provide valuable information to healthcare providers that enriches healthcare interventions and enhances service quality [12]. The prevalence of DMD and BMD in our study is estimated to be 1.9 percent per 100,000 people. The overall prevalence of DMD, and BMD worldwide was estimated at 4.6, and 1.6 per 100,000 people, respectively. The Americas have the highest prevalence of 5.1 per 100,000 people, while Africa has the lowest prevalence of 1.7 percent per 100,000 people. The age of onset and severity of symptoms in DMD and BMD are different. Rapidly progressing muscle degeneration in DMD patients causes symptoms around the age of 3 and loss of ability to stand and move and wheelchair dependence around the age of 13 years. Another threatening issue is the involvement of the cardiac muscle and respiratory system, which is the leading cause of death in these patients [13]. Physiotherapy aims to maintain function for as long as possible, delay disability, and prevent complications such as contractures, postural deformities, respiratory decline, and loss of safe mobility. Therefore, the best physiotherapy effect is typically achieved through safe dosing rather than maximal effort but outcomes unfold over a longer timeline. Identifying patients and proper management to improve the quality of life of patients and their families, and help achieve better therapies, the use of supportive therapies to reduce the symptoms of the disease seems useful as shown by the percent of recovery from the physiotherapy reached 30% in BMD. Physiotherapy still plays a preventive role, but outcomes unfold over a longer timeline.

Conclusion: There is a variety of muscular dystrophies that DMD and BMD are the most common forms after myotonia. That leads to gradual weakness and degeneration of muscles, especially skeletal and cardiac muscle. The study shows benefits of physiotherapy in these disorders and provides insights into prevalence of DMD and BMD however; further studies with larger sample sizes are needed to confirm these findings

References:

1. Tiffany,H and Regina E. Dowdy, (2023), Review of Muscular Dystrophies Anesth Prog71:44–522024 | doi 10.2344/673191 Received November 13, accepted for publication February 9, 2024.
2. Koenig M, Hoffman EP, Bertelson CJ et al (1987) Complete cloning of the Duchenne muscular dystrophy (DMD) cDNA and preliminary genomic organization of the DMD gene in normal and affected individuals. Cell 50:509–517
3. Hoffman EP, Brown RH, Kunkel LM (1987) Dystrophin: the protein product of the Duchenne muscular dystrophy locus. Cell 51:919–928
4. Mercier S, Toutain A, Toussaint A et al (2013) Genetic and clinical specificity of 26 symptomatic carriers for dystrophinopathies at pediatric age. Eur J Hum Genet 21:855–863
5. Flanigan,Kevin M.D. and Becker, (2014), muscular dystrophies. Neurol Clin. 2014;32(3):671–688.
6. Segura LG, Lorenz JD, Weingarten TN, (2013), Anesthesia and Duchenne or Becker muscular dystrophy: review of117anesthetic exposures. Pediatr Anesth; 23(9):855–864.
7. Lanza G, Pino M, Fisicaro F, Vagli C, Cantone M, Pennisi M, Bella R, Bellomo M (2020) Motor activity and Becker's muscular dystrophy: lights and shadows. Phys Sportsmed 48(2):151–160
8. Alemdaroğlu I, Karaduman A, Yilmaz OT, Topaloğlu H (2015) Different types of upper extremity exercise training in Duchenne muscular dystrophy: effects on functional performance, strength, endurance, and ambulation. Muscle Nerve 51(5):697–705
9. Birnkrant DJ, Bushby K, Bann CM, Alman BA, Apkon SD, Blackwell A, Case LE, Cripe L, Hadjiyannakis S, Olson AK, Sheehan DW, Bolen J, Weber DR, Ward LM, DMD Care Considerations Working Group (2018) Diagnosis and management of Duchenne muscular dystrophy, part 2: respiratory, cardiac, bone health, and orthopaedic management. Lancet Neurol 17(4):347–361

10. Finder JD (2009) A 2009 perspective on the 2004 American Thoracic Society statement, "respiratory care of the patient with Duchenne muscular dystrophy." Pediatrics 123:S239–S241
11. Michelle C, Hui-Leng T, Andrew B, Mark R, Anita KS (2015) Long term non-invasive ventilation in children: impact on survival and transition to adult care. PLoS One 10(5):e0125839
12. Clark M-J. (2007), Family function in families of children with Duchenne muscular dystrophy. Fam Community Health; 30(4):296–304.
13. Nader, S, Behnaz, F, Elahe, V, Mohsen, K, Reza, F, Aliakbar, K, Shamarina, S and Masoud, M, (2022), Global prevalence of Duchenne and Becker muscular dystrophy: a systematic review and meta-analysis Journal of Orthopaedic Surgery and Research. 17:96