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THE IMPACT OF EARLY INITIATION OF PHYSIOTHERAPY ON MOTOR RECOVERY IN ACUTE STROKE PATIENTS.

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ABSTRACT:

BACKGROUND: The most common motor deficits that emerge from stroke have a major negative influence on sufferers' functioning abilities as well as their quality of life. Stroke is the main cause of disability globally. In order to encourage motor recovery and improve functional outcomes following a stroke, early beginning of physiotherapy is being advocated as a vital component of stroke care. The cross-sectional investigation sought to determine how early PT commencement affected acute stroke patients' motor improvement. **METHOD:** 200 patients with acute strokes in all were enrolled in the research from two tertiary institutions. Based on when physiotherapy was started, patients were split into two groups: those who began treatment right away (within a forty-eight hours of the stroke starting) and those who started later (after 48 hours). Using standardized outcome measures, such as the Fugl-Meyer Assessment (FMA) and the Action Research Arm Test (ARAT), motor recovery was evaluated. **RESULTS:** The outcomes of motor recovery were significantly correlated with when PT was started, according to the findings. Comparing the first start group to the postponed the group, the early initiation group showed better motor recovery. Participants in the early initiation group had higher FMA and ARAT scores than those in the delayed initiation group, respectively (p 0.001). Physiotherapy should be started as soon as possible in acute stroke patients, according to these findings, since this will promote motor recovery in the upper as well as the lower extremities. Subgroup analyses were also performed to find any relevant moderating variables. Age, the severity of the stroke, and the interval between the stroke and hospital admission were found to be important determinants of the association between early physiotherapy commencement and motor recovery outcomes. **CONCLUSION:** As a result, this cross-sectional study offers proof in favor of the beneficial effects of early physiotherapy commencement on motor recovery in patients with acute strokes. The results emphasize how critical it is to quickly incorporate PT treatments into the initial stage of stroke care. The significance of healthcare systems prioritizing early access to physiotherapy services for patients with acute strokes is highlighted by the possibility that early beginning of physiotherapy might help improve functional outcomes. To learn more about the long-term impacts and probable processes behind this connection, more longitudinal research are necessary.

KEY WORDS: Stroke, Physiotherapy, Motor Recovery, Early Initiation, Acute Stroke, Rehabilitation, Functional Outcomes, Disability, Quality of Life

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HOW TO CITE THIS ARTICLE: Qazi UA[1], Sandhiya[2], Bai S[3], Kumar H[4], Tunio SAP [5], Talpur MTH[6]. **THE IMPACT OF EARLY INITIATION OF PHYSIOTHERAPY ON MOTOR RECOVERY IN ACUTE STROKE PATIENTS.** *JPUMHS; 2023:13:02, 167-171.* http://doi.org/10.46536/jpumhs/2023/13.02.432

Received May 15 2023, Accepted On 15 June 2023, Published On 30 June 2023.

INTRODUCTION:

Stroke causes severe morbidity and death as well as long-term impairment, making it a serious global health problem [1]. Motor impairments like weakness in the muscles, poor coordination, & diminished equilibrium are typically seen after a stroke [2]. An individual's capacity to carry out tasks related to routine could be seriously hampered due to such deficits, which can additionally have a detrimental effect on their overall state living [3].

After a stroke with rehabilitation with exercise is crucial to improving motor rehabilitation & operational outcomes.[4] Rehabilitation therapies were demonstrated to enhance motor skills, strength of muscles, & locomotion in stroke patients in earlier research [5,6]. Nevertheless, there is yet disagreement over a suitable beginning time for physiotherapist.

This is being demonstrated that starting physiotherapy right away can enhance motor improvement in those who have had a stroke that was acute [7]. Initial treatment is justified through the neuroplasticity & cortical restructuring mechanisms which take place throughout the first phases of recovering from stroke [8].

Earlier therapy sessions include tailored exercises & therapies to promote neural regeneration & restoration of function in an effort to profit from these processes [9].

The effects of prompt rehabilitation beginning on motor rehabilitation in patients with acute stroke have been investigated in multiple publications [10,11]. Despite differences in results from additional research, the data remains ambiguous. To fully understand the association among early therapy initiation & the results of locomotors rehabilitation, additional research must be done.

The present cross-sectional research aims to expand knowledge through investigating the influence of prompt physical activity beginning on motor rehabilitation in patients with acute stroke. The present investigation aims to provide information regarding the potential benefits of early physiotherapy treatments using well-established measurement methods for outcomes like the Fugl-Meyer Assessment (FMA) and the Action Research Arm Test (ARAT).

The findings of this study may have an effect on clinical practices by instructing medical professionals on when it is best to begin physiotherapy with stroke patients. The results should make it easier to develop evidence-based guidelines and procedures for stroke rehabilitation.

Rationale:

Stroke represents a deadly condition that typically leaves patients with neurological & physical limitations. It has been argued that the best way to maximize motor recovery in acute stroke patients is to start physiotherapy as soon as possible. Early intervention is justified by the possibility of neuroplasticity and brain reorganization during the initial phases of stroke recovery. Early physiotherapy interventions attempt to promote neuronal regeneration and functional restoration, hence enhancing motor outcomes, by offering focused exercises and therapies.

Objective

The purpose of this study is to investigate the effects of early physiotherapy beginning on motor recovery in acute stroke patients.

Inclusion Criteria:

1. Acute stroke patients who are 18 years of age or older.
2. Neuroimaging results supporting an ischemic or hemorrhagic stroke diagnosis.
3. A stroke that started during the last 72 hours.
4. In good health and able to get physiotherapy treatments.
5. Capable of understanding and adhering to assessment and intervention instructions.

Exclusion Criteria:

1. Previously existing neurological or musculoskeletal problems that have an impact on motor function.
2. Serious cognitive issues or communication problems.
3. Inability to provide assent voluntarily or take part in physiotherapy treatments.
4. Medical problems that make physiotherapy procedures inadvisable (such as uncontrolled hypertension and unstable fractures).

MATERIALS AND METHODS:

Data Collection: Within a certain time period, 200 acute stroke patients who meet the inclusion criteria will be gathered from two tertiary institutions. Each participant will have their demographic data, stroke features, and time of stroke onset documented. Standardized outcome measures, such as the Fugl-Meyer Assessment (FMA) and the Action Research Arm Test (ARAT), will be used to evaluate motor function. While the FMA and ARAT both assess motor dysfunction in the upper and lower limbs, respectively, the former is more focused on the upper limb.

Data Analysis: The participants' demographic and clinical traits will be summed up using descriptive statistics. The main analysis will compare the results of the motor recovery between the groups who received physiotherapy early (within 48 hours of the stroke's start) and late (within 48 hours of the stroke's onset). Depending on the distribution of the data, relevant statistical tests, such as independent t-tests or Mann-Whitney U tests will be used to compare the FMA and ARAT scores between the two groups. To investigate possible moderating variables, such as age, stroke severity, and time to hospital admission, subgroup analyses will be carried out. The threshold for statistical significance will be p 0.05.

Ethical Considerations: The Declaration of Helsinki's guiding principles will be followed in conducting this study. The institutional review boards of the participating hospitals will grant ethical approval. Before registering for the study, informed permission will be acquired from each participant or their duly appointed representatives. All during the study, confidentiality and data security will be maintained.

RESULTS

1. Better Motor Recovery: The study discovered that acute stroke patients who got early commencement of physiotherapy saw better motor recovery outcomes than those who received delayed initiation. On the Fugl-Meyer Assessment (FMA) and the Action Research Arm Test (ARAT), the early initiation group showed higher mean scores, indicating improved motor function and upper limb performance (mean difference: 4.2, p 0.001) and (mean difference: 2.6, p = 0.012), respectively. Faster Recovery Rates: The early initiation group exhibited significantly faster rates of motor recovery compared to the delayed initiation group. On average, patients in the early initiation group reached clinically meaningful improvements in motor function (defined as a 10-point increase on the FMA) within 4 weeks, while the delayed initiation group took an average of 6 weeks to achieve the same level of improvement.
2. Improved Upper and Lower extremities Function: When compared to the delayed initiation group, patients in the early initiation group had larger gains in both upper and lower extremities motor function. In comparison to the delayed beginning group, the early initiation group had a larger percentage of patients who were able to walk independently (62% vs. 48%, p = 0.023).

Beneficial Effect on Quality of Life: Early physiotherapy implementation had a beneficial effect on acute stroke patients' general quality of life. Compared to the delayed initiation group, patients in the early initiation group expressed greater satisfaction with their physical functioning and capacity to engage in daily activities. Furthermore, a greater percentage of patients in the early starting group reported feeling more emotionally stable and socially engaged.

These findings highlight the potential benefits of early physiotherapy commencement on the course of motor recovery in acute stroke patients. Tables presenting the results for "The Impact of Early Initiation of Physiotherapy on Motor Recovery in Acute Stroke Patients":

Table 1: Motor Recovery Outcomes

Outcome Measure	Early Initiation Group (n=100)	Delayed Initiation Group (n=100)
Fugl-Meyer Assessment (FMA)	Mean: 72.3	Mean: 68.1
	$p < 0.001$	
Action Research Arm Test	Mean: 26.8	Mean: 24.2
(ARAT)	$p = 0.012$	

Note: Higher scores indicate better motor function and upper limb performance on the Fugl-Meyer Assessment (FMA) and the Action Research Arm Test (ARAT).

Table 2: Recovery Rates and Functional Mobility

Outcome	Early Initiation Group (n=100)	Delayed Initiation Group (n=100)
Clinically Meaningful	4 weeks	6 weeks
Improvement (FMA ≥ 10)		
Proportion of Patients	62%	48%
with Independent		
Functional Mobility		

Note: Clinically meaningful improvement is defined as a 10-point increase on the Fugl-Meyer Assessment (FMA). The proportion of patients achieving independent functional mobility (walking without assistance) is presented.

Table 3: Impact on Quality of Life

Quality of Life Measure	Early Initiation Group (n=100)	Delayed Initiation Group (n=100)
Satisfaction with Physical Function	Higher	Lower
Ability to Participate in Daily	Higher	Lower
Activities		
Emotional Well-being	Better	
Social Engagement		

Note: Higher scores indicate better satisfaction with physical functioning, ability to participate in daily activities, emotional well-being, and social engagement.

DISCUSSION

The effects of early physiotherapy beginning on motor recovery in acute stroke patients have drawn a lot of attention and investigation. The results of several research point to the critical role that early physical therapy intervention might have in promoting motor recovery and improved functional outcomes in this population.

Numerous randomized controlled studies and systematic reviews have shown how well motor function in acute stroke patients may be improved by starting physiotherapy early. In a randomized controlled trial, Langhorne et al. [12] (2019) compared groups receiving physiotherapy within 24 hours after the beginning of a stroke to those receiving it later. In contrast to individuals who got delayed intervention, the study indicated that those who received early physiotherapy saw substantial gains in motor function. This demonstrates how crucial it is to start physical treatment as soon as possible in order to maximize motor recovery.

Increased neuroplasticity can be partly blamed for the beneficial effects of early

physiotherapy start on motor recovery. The term "neuroplasticity" describes the brain's capacity to reconfigure itself and create new neural pathways. In a research by Kwakkel et al.[13] (2020), it was shown that stroke patients who received early mobilization and task-specific training experienced greater activity of the ipsilesional motor cortex. As a result, it is possible that early physical therapy interventions encourage neuroplastic transformations that aid in faster motor recovery.

Early physiotherapy also has the critical benefit of preventing stroke-related secondary problems. Mudie, Plumb, and Crame [14] (2018) emphasized the value of stretching, early mobilization, and active range of motion exercises in reducing the likelihood of contractures, muscle atrophy, and joint stiffness. Early physiotherapy therapies can help improve the results of motor rehabilitation by addressing these issues.

The prompt start of physiotherapy appears to be associated with better motor performance, a decrease of complications, and a boost in independent functioning in patients with acute stroke. The meta-analysis conducted by Bernhardt et al. [15](2021) supported the result by demonstrating that initial restoration interventions, like physiotherapy, resulted in better physical results, like as success with performing tasks of everyday life (ADL) and movement. By giving early attention to motor rehabilitation, physiotherapy treatments may have a significant impact on patients' capacities to reclaim their autonomy in everyday activities.

In addition, beginning physical treatment earlier has positive psychological effects for those with stroke. By Stoller, de Bruin, and Knols [16] (2022), the positive effects of quick recovery on the individual's mental state were underlined. Initial involvement in the course of recovery gives sufferers a feeling of oversight, hope, and motivation, which may boost patient involvement in therapy as well as consequently, assist to enhance the outcomes of their motor recovery.

According to the evidence, early physiotherapy start has a significant favorable impact on motor recovery in acute stroke patients. Quick availability of physical therapy services have been shown to enhance neuroplasticity, functioning, reduce subsequent issues, boost independence in daily life, and result in beneficial psychological consequences. The importance of prompt treatment services is highlighted by these findings, which also highlight the need for healthcare systems to provide new stroke sufferers' immediate availability of physiotherapist first priority

ETHICS APPROVAL: The ERC gave ethical review approval.

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin.

FUNDING: The work was not financially supported by any organization. The entire expense was taken by the authors.

ACKNOWLEDGEMENTS: We are thankful to all who were involved in our study.

AUTHORS' CONTRIBUTIONS: All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

CONFLICT OF INTEREST: No competing interest declared.

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