

Effect of Rehabilitation Program using Training Aqueous on Improving the Functional Abilities of Patients with hemiplegia

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Introduction and research problem

The health of the individual is the criterion for the effectiveness of physical education and sports activities, where the preservation and improvement of human health of the main tasks of physical education and sports activities and is very important to raise the state of health to provide an optimal level of physical fitness and immunity to the body.

It is useful to quantify health scores for healthy people (who do not have clinical symptoms), which allows for a set of health-oriented measures, especially those based on physical education factors.

Awareness of the benefits of aerobic exercise has grown, and it is now one of the most modern methods of preventive medicine and natural therapy in the face of many treatments for post-injury, general health or fitness, weight loss, fitness, and overall fitness and health. (12: 12) (103: 27)

Lee CD (2003) notes that he used water exercises to treat muscle weakness and paralyzed limbs because of his properties, which makes him an excellent medium for many of the goals. The water medium is characterized by floating on water, which in turn reduces the individual's sense of weight and real body pressure reality on the main joints, compared with the movement of the body on the land. (23:18)

The results of the study of both diabetes charity Ibrahim and Youssef Dahab Ali, Muhammad Jaber Bureka (2001), show the benefits of hydrotherapy for high level athletes and the levels of rehabilitation and treatment by performing a few times in the water medium through the intensity of rapid training and thus gaining high fitness and performance In turn, avoid injury and help to return to normal (stage of recovery)

After the performance of competitions or violent exercises or can perform water exercises on a daily basis sequentially and increase the time of the training module and raise some of the motor abilities (strength, speed, flexibility, (23:7)

Osama Awni (2009) states that the water center is effective because it has different properties from the air characteristics in which the individual trains on the ground in terms of nature, composition, density and resistance, in which the individual loses a sense of gravity due to buoyancy. %,

Which helps to relieve pain and allow the individual to train longer and repeatedly as well as gain more benefits without any possibility of injury in the joints or muscles or muscle ligaments. (85: 1)

And that these properties are ideal for achieving the therapeutic goals because of the environment of effective and safe for many individuals.

The exercise is both negative or positive, one of the most important branches of rehabilitation therapy used in the treatment of injuries and rehabilitation of paralyzed individuals who have not been able to achieve the objectives of exercise in regular clinics, and can successfully achieve this by participating in aquatic programs. (29: 3)

The water has an effect on pain relief, improves muscle contractility and prevents rapid muscular stress, and uses the down-to-top water force as an auxiliary and resistance external force during the exercise of voluntary exercise (35:19)

Thus, exercise is important for people with paraplegia, as it improves basic motor skills (such as standing, walking and sitting), relieving cramping, and stiffening of joints due to lack of movement (103: 9) (74:13)

The research problem is that rehabilitation exercises are an essential and important method after the physiotherapy phase. It helps the patient regain the loss of physical fitness resulting from stroke. In addition, there is a deficiency in the functions of some other vital organs such as respiratory system due to lack of movement.

The researcher found a scarcity in the rehabilitation programs using water exercises in patients with semi-paralysis, despite their importance in the rehabilitation process for people with paraplegia, and only interested in rehabilitation using the equipment and exercises such as the study of Ashraf Abdel Salam (2003) (2), Ehab Mustafa (2014) Dr. Massad (2002) (14), and references to study the effectiveness of the use of water exercise degree better in the treatment of cerebral palsy, prompting the researcher to conduct this study in an attempt to improve the level of functional efficiency in patients with cerebral migraine.

Research goal

The aim of the research is to identify the effect of a hydrotherapy program on the functional level of patients with paraplegia.

Research hypotheses

There were statistically significant differences between mean and post measurements in the elasticity of patients with semi-paralysis of the research sample.

There were statistically significant differences between mean and post measurements of muscle strength in patients with paraplegic hemorrhage.

There were statistically significant differences between mean and post measurements of the degree of pain in patients with semi-paralysis of the research sample.

Research Methodology

The researcher used the experimental method to suit the nature of the research and to achieve the goals and hypotheses.

Community and Sample Search:

The research community included stroke patients, which resulted in the presence of half paralysis in one of the two halves of the body. The research sample was chosen in a deliberate manner by patients with paraplegia due to cerebral thrombosis (12) of men infected and migrating to the unit of treatment, (50-60 years old), and (4) study patients.

Homogeneity of the research sample:

The researcher conducted homogeneity between the members of the research sample in the variables that affect the results of the research as follows:

Table (1)
The normal distribution of the basic variables and the level of flexibility and muscle strength and degree of pain in patients with semi-paralysis of the research sample
N = 12

| Variables | | Measuring unit | Average | SMA | standard deviation | Torsion coefficient |
|------------------------------------|------------------------------------|----------------|---------|--------|--------------------|---------------------|
| Growth rates | Age | Year | 61.52 | 61.50 | 0.65 | 0.092 |
| | Height | Cm | 165.21 | 165.00 | 3.30 | 0.190 |
| | Weight | Kg | 81.25 | 80.00 | 2.25 | 1.66 |
| Flexibility for the affected party | Lift the shoulder high | Degree | 44.20 | 44.00 | 2.21 | 0.271 |
| | Contraction of the elbow joint | Degree | 91.26 | 91.00 | 2.25 | 0.346 |
| | Stretch wrist joint | Degree | 141.26 | 140.00 | 5.32 | 0.710 |
| | Contractions of the femoral joints | Degree | 182.25 | 180.00 | 7.21 | 0.936 |
| | Lift your thigh high | Degree | 10.12 | 10.00 | 1.02 | 0.352 |
| | Lift the thigh aside | Degree | 12.65 | 12.50 | 1.11 | 0.405 |
| | Knee joint constriction | Degree | 172.32 | 172.00 | 4.62 | 0.207 |
| | Stretch knee joint | Degree | 141.26 | 141.00 | 4.28 | 0.182 |
| | Ankle joint constriction | Degree | 122.25 | 122.00 | 3.21 | 0.233 |
| | Stretch ankle joint | Degree | 146.21 | 145.00 | 3.58 | 1.013 |
| | Contraction of the wrist joint | Degree | 188.32 | 185.00 | 4.40 | 2.26 |
| | Stretch wrist joint | Degree | 155.62 | 155.00 | 4.39 | 0.423 |
| | Contraction of trunk to front | Degree | 151.25 | 151.00 | 3.54 | 0.211 |
| Muscle strength | Strength of grip muscles | Kg | 6.21 | 6.20 | 1.02 | 0.0294 |
| | Strength of leg muscles | Kg | 15.21 | 15.00 | 1.36 | 0.463 |
| | Strength of back muscles | Kg | 13.25 | 13.20 | 0.74 | 0.202 |
| The degree of muscular pain | | Degree | 7.21 | 7.00 | 0.50 | 0.001 |

It is clear from Table (1): The homogeneity of the research sample in the basic variables (elasticity - muscle strength - pain level) in the study. The values of the torsion coefficient ranged between (0.001: 1.013.)

Data collection tools:

- 1-Instruments and measuring devices
- 2-Means of data collection
- 3-Hydrotherapy.

A) The tools and devices used in the research.

- Medical balance for weight measurement (kg)
- Resistameter for measuring length (in centimeters)
- Flexometer device to measure the range of motor joints of the body.
- Electronic dynamometer for measuring muscle strength.
- The degree of pain (V. A. S) to measure the degree of pain.

Data collection forms.

- Registration form for patient data collection. Annex (4)
- Form of the proposed qualification program. Annex (3)
- CT scan of brain C.T. Brain to examine the condition of the medical brain by a report explained by the case, which shows if the blockage in the artery large or small is approved by the consultant of the nerves.

Proposed Rehabilitation Program (under study)

The researcher developed the proposed rehabilitation program for patients with paraplegia according to the scientific basis of medical rehabilitation after reviewing the specialized scientific references and previous studies in physiotherapy and medical rehabilitation,

Which include exercises for the development of daily movements and the level of functional efficiency of flexibility, muscular strength and pain level. For the motor development of the stages of the rehabilitation program.

The content of the proposed rehabilitation program

The researcher used specialized scientific references in the medical rehabilitation of patients with semi-paralysis and the opinions of experts in the field of medical rehabilitation through a questionnaire of experts on the axes and periods of the proposed rehabilitation program and took into account the differences of views of physiotherapists in determining the duration and duration of the qualification session. The difference in the number of units and the number of qualifying hours between Specialists

Components of the proposed rehabilitation program

- Period of application of the proposed rehabilitation program = 3 months = (12) weeks.
- Number of qualifying units per week = 3 units
- Number of qualifying units during the proposed program = 3 units x 12 weeks = 48 units.
- The average time of the daily qualifying unit in the program is (35) minutes.
- The contents of the proposed rehabilitation program included a group of training exercises for the development of daily movements and functional efficiency in patients with paralysis.
- Performance training in the light of scientific foundations in medical qualification.
- Use positive rest sufficient to not overload the patient between groups and rehabilitation units.
- To divide the time period of application of the program (12) week to three stages as follows:

Suggested training exercises and their contents:

The proposed exercises and their contents were developed for three months, divided into three stages, each stage (4) weeks, with (3) weekly units, and the number of sessions for the proposed program (48) sessions.

The first stage:

A series of intensive strenuous exercises with therapeutic exercises and water massage alongside electrotherapy.

The goal of this phase is:

- 1- Activation of blood circulation and lymphatic system.
- 2- flexibility of the trunk and paragraphs.
- 3-stimulate and alert the nerves and muscles and joints of the trunk and the formation of non-functioning muscles and non-atrophy.
- 4-work on the early positive for muscle work of the lower end and flexibility of the trunk and alleviate the pain in a framework of exercises aimed at maintaining the efficiency of the spine and physical efficiency of the physiological and muscular and this stage is under the supervision of the doctor and carried out by the researcher to improve the condition of the patient relatively.

The second phase:

It is a group of static exercises and dynamic exercises of gradual intensity and increase the duration of training exercises and hydrotherapy as well as electrotherapy.

The goal of this phase is:

- Increased stability in the activation and strengthening of the trunk especially the muscles of the back and abdomen and legs and flexibility of the trunk and ease the pain.
 - Do a static exercise isometric fixed seconds for the affected lower limb.
 - Conducting fixed exercises for a period of more than (10) seconds.
 - Increasing the training exercises and the gradual increase in the first stage and increase the load and the number of repetitions and groups and these are also under the supervision of the doctor who performed the surgery and implemented by the researcher.

Third level:

- It is a series of dynamic training exercises with varying intensity, with the use of various tools and devices, such as walking, wall and climbing, and resistance of the specialist, stationary bike, various weights, weight (15 days), electrical treatment, this phase aims to:
- the patient to rely on himself to do exercises to the maximum extent possible to measure the severity of pain and flexibility of the trunk and strength of the muscles of the back and legs and abdomen.

- Public and private rehabilitation exercises continue to improve the efficiency and flexibility of the spine until the end of the program.
- Adopt the patient himself positively and the use of walking devices such as walking and stationary bike, which helps to do so.
- Exercises for each stage and include exercises for strength of the muscles of the legs and back and abdomen and flexibility of the lumbar region and spine in all directions.
- Exercise is easy to hard.
- Exercise to the limits of pain.

The content of each session during the first (30) days

| Total period | Therapeutic exercises (by Water) | Water massage | Ultrasonic | Electrical Alert | Infrared | Content |
|--------------|----------------------------------|---------------|------------|------------------|----------|-------------|
| 30m | 10m | 5m | 5m | 5m | - | First week |
| 30m | 10m | 5m | 5m | 5m | - | Second week |

The content of each session during the (30) second day

| Total period | Therapeutic exercises (by Water) | Water massage | Ultrasonic | Electrical Alert | Infrared | Content |
|--------------|----------------------------------|---------------|------------|------------------|----------|-------------|
| 40m | 20m | 5m | 5m | 5m | 5 | Third week |
| 45m | 20m | 10m | 5m | 5m | 5 | Fourth week |

The content of each session during the last 30 days

| Total period | Therapeutic exercises (by Water) | Water massage | Ultrasonic | Electrical Alert | Infrared | Content |
|--------------|----------------------------------|---------------|------------|------------------|----------|------------|
| 50m | 25m | 10m | 5m | 5m | 5 | Fifth week |
| 60m | 25m | 15m | 5m | 10m | 5 | Sixth week |

View and discuss the results

First: Display the results

Table (2)

Indication of the differences between the pre and post measurements of the sample in the level of flexibility

For patients with semi-paralysis of the research sample

N = 12

| Variables | Measuring unit | Pre measuring | | Post measuring | | Difference between averages | Improvement rate | Calculated value (t) | Level of significance |
|------------------------------------|----------------|---------------|------|----------------|------|-----------------------------|------------------|----------------------|-----------------------|
| | | ±S | ±E | ±S | ±E | | | | |
| Lift the shoulder high | Degree | 44.20 | 2.21 | 68.20 | 1.21 | 24.00 | 35.19% | 3.58 | Indicate |
| Contraction of the elbow joint | Degree | 91.26 | 2.25 | 51.23 | 1.11 | 40.03 | 43.86% | 3.21 | Indicate |
| Stretch wrist joint | Degree | 141.26 | 5.32 | 181.25 | 2.01 | 39.99 | 22.06% | 3.69 | Indicate |
| Contractions of the femoral joints | Degree | 182.25 | 7.21 | 92.20 | 1.69 | 90.05 | 49.41% | 3.21 | Indicate |
| Lift your thigh high | Degree | 10.12 | 1.02 | 47.20 | 0.21 | 37.08 | 78.55% | 3.58 | Indicate |
| Lift the thigh aside | Degree | 12.65 | 1.11 | 36.21 | 0.58 | 23.56 | 65.06% | 3.64 | Indicate |
| Knee joint constriction | Degree | 172.32 | 4.62 | 61.25 | 1.30 | 111.07 | 64.45% | 3.15 | Indicate |
| Stretch knee joint | Degree | 141.26 | 4.28 | 170.36 | 1.08 | 29.10 | 17.08% | 3.87 | Indicate |
| Ankle joint constriction | Degree | 122.25 | 3.21 | 95.20 | 1.09 | 27.05 | 22.12% | 3.15 | Indicate |

| | | | | | | | | | |
|--------------------------------|--------|--------|------|--------|------|-------|--------|------|----------|
| Stretch ankle joint | Degree | 146.21 | 3.58 | 164.28 | 1.21 | 18.07 | 10.99% | 3.52 | Indicate |
| Contraction of the wrist joint | Degree | 188.32 | 4.40 | 140.32 | 1.08 | 48.01 | 25.49% | 3.84 | Indicate |
| Stretch wrist joint | Degree | 155.62 | 4.39 | 110.20 | 1.11 | 45.42 | 29.18% | 3.36 | Indicate |
| Contraction of trunk to front | Degree | 151.25 | 3.54 | 102.32 | 1.36 | 48.93 | 32.35% | 3.94 | Indicate |

•Tabular value (t = 0.05) = 1.812

Table (2) shows statistically significant differences at the significance level of 0.05 between the pre and post measurements of the research sample in the flexibility level for patients with semi-paralysis. The calculated value (t) is higher than the tabular value at the significance level (0.05) There were statistically significant differences at (0.05) between the pre and the post measurements.

Table (3) Indication of differences between the pre and post measurements of the sample in the level of muscle strength For patients with semi-paralysis of the research sample N = 12

| Variables | Measuring unit | Pre measuring | | Post measuring | | Difference between averages | Improvement rate | Calculated value (t) | Level of significance |
|--------------------------|----------------|---------------|------|----------------|------|-----------------------------|------------------|----------------------|-----------------------|
| | | ±S | ±E | ±S | ±E | | | | |
| Strength of grip muscles | Kg | 6.21 | 1.02 | 10.36 | 0.21 | 4.15 | 40.05% | 4.95 | Indicate |
| Strength of leg muscles | Kg | 15.21 | 1.36 | 21.02 | 0.17 | 5.81 | 27.64% | 4.32 | Indicate |
| Strength of back muscles | Kg | 13.25 | 0.74 | 19.20 | 0.23 | 5.95 | 30.98% | 4.28 | Indicate |

•Tabular value (t = 0.05) = 1.812

Table (3) shows statistically significant differences at the significance level of 0.05 between the pre and post measurements of the research sample at the muscle strength level of the paraplegic patients. The calculated value (t) is higher than the tabular value at the significance level (0.05) There were statistically significant differences at (0.05) between the pre and the post measurements.

Table (4) Indication of differences between the pre and post measurements of the sample in the level of pain For patients with semi-paralysis of the research sample N = 12

| Variables | Measuring unit | Pre measuring | | Post measuring | | Difference between averages | Improvement rate | Calculated value (t) | Level of significance |
|---------------|----------------|---------------|------|----------------|------|-----------------------------|------------------|----------------------|-----------------------|
| | | ±S | ±E | ±S | ±E | | | | |
| Level of pain | Degree | 7.21 | 0.50 | 4.10 | 1.02 | 3.11 | 43.13% | 6.62 | Indicate |

•Tabular value (t = 0.05) = 1.812

Table (4) shows statistically significant differences at the significance level of 0.05 between the pre and post measures of the research sample in the pain level of the paraplegic patients. The calculated value (t) is higher than the tabular value at the significance level (0.05) there were statistically significant

differences at (0.05) between the pre and the post measurements.

Discussion of results

Table (2) shows statistically significant differences at the significance level of 0.05 between the pre and post measurements of the research sample in the flexibility level for patients with semi-paralysis. The calculated value (t) is higher than the tabular value at the significance level (0.05) There are statistically significant differences at the level of (0.05) between the pre and post measurements.

The researcher returns the result to the proposed program using the hydrotherapy exercises, which included static and dynamic exercises that help improve the muscle strength of the various muscles of the body. Activate the Subject to bloody and improve the level of traffic in the affected part after a stroke, cerebral.

In 2006, Naima Abdul Salam (2010) reported that stroke patients suffer from musculoskeletal, connective tissue dysfunction, functional impairment of muscular strength, lack of mobility, and functions associated with nerves and muscles. The exercise of motor activity has a major role in the treatment of this disorder (92: 5) (12:15)

Rehabilitation is an important means of restoring the injured part to normal and only 40% of people with stroke can return to work, and the rest becomes handicapped and disabled energies that pose economic burdens on the family and community level. (47: 5)

Hancock Nicola (2011) states that friction resistance to water works to strengthen the muscles of the body and that hydrotherapy performed at rapid and repetitive rates improves the muscle tone of large groups (16: 48-53)

Thus, the first hypothesis of the research, which states that there are statistically significant differences between mean and post measurements of the elasticity level of patients with semi-paralysis of the research sample

Table (3) shows statistically significant differences at the significance level of 0.05 between the pre and post measurements of the research sample at the muscle strength level of the paraplegic patients. The calculated value (t) is higher than the tabular value at the significance level (0.05) there were statistically significant differences at (0.05) between the pre and post measurements.

The researcher attributed the result to the proposed rehabilitation program applied to patients with paraplegia, which included simple external resistance exercises that contributed to improving the muscle strength of the injured

According to Charity Diabetes (1998), muscle strength is one of the most important physical and motor abilities that affect the level of daily motor performance. Muscle strength is one of the most important basic elements of individuals, and the use of the water medium contributes to its direct improvement.

The results of the studies of Mr. Abdo (2009) (3) and Ya-Xuan (2016) agree on the development of the muscular balance of the working muscles in the performance and the corresponding muscles in sports activities.

Thus, the second hypothesis of the research, which states that there are statistically significant differences between mean and post measurements in the level of muscular strength of patients with semi-paralysis of the research sample

Table (4) shows statistically significant differences at the significance level of 0.05 between the pre and post measures of the research sample in the pain level of the paraplegic patients. The calculated value (t) is higher than the tabular value at the significance level (0.05) There were statistically significant differences at the level of (0.05) between the pre and post measurements due to the exercise of the program of the proposed therapeutic exercises (water) regularly and the focus of the program during the first phase on pain relief through physical exercises selected in the water, which contributed effectively to improve These variables are confirmed by this Neutrophils change dimensional measurements

Hesse (2011) has confirmed that the exercise of a program of therapeutic exercises have the best impact and is a safe and have satisfactory results in pain relief and that the use of some physical therapy methods such as infrared and electrical stimulation and short waves and massage have an effective role in the relief of pain and help in addition to the use of rehabilitation Watermark (17:17)

Thus, the third hypothesis of the research, which provides that there are statistically significant differences between mean and post measurements of the degree of pain in patients with semi-paralysis of the research sample

Conclusions

- Use of the proposed program of water training exercises because of its positive impact on the improvement of flexibility (shoulder - elbow - thigh - knee - ankle - hand) in patients with paralysis.
- Use of the proposed program of water training exercises because of its positive impact on the improvement of the level of muscle strength (hand - back - the man) in patients with paralysis of half.
- Use of the proposed program of water training exercises because of its positive impact on reducing the pain index of people with paraplegia.

Recommendations

- The use of hydrotherapy training because of its positive impact on improving the functional efficiency of people with paraplegia.
- Expand the use of hydrotherapy exercises because of their positive impact on improving the functional efficiency of people with paraplegia.
- Initiate water training exercises in the first qualifying stages of the programs to overcome the low level of pain during the rehabilitation process.

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