

The effectiveness of a Hydrotherapy program in the improvement of functional efficiency of the joints of the left side of the body for patients with blood clots

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Introduction:

Stroke is one of the most important causes of death worldwide and is a medical emergency that requires patients to receive rapid medical attention, as it leads to the rapid onset of neurological symptoms within seconds or minutes of a stroke, the largest and most widespread neurological disorder of our time. The blood has been cut off, leading to the likelihood of brain cells dying, and depending on the severity of the stroke, blockage of the blood vessels, or the amount of noise in them, the symptoms vary, and the extent of the deficiencies they cause

(10 : 474 -475)

If the stroke is treated very quickly, this does not indicate a significant risk as some people wake up after fainting if they faint, and many regain some muscle strength with therapeutic exercises provided they stay still. (1 : 288)

One way to treat this damage is medication. Within the first three hours of stroke diagnosis, the patient is treated with clot solvents and, in other cases, is injected with TPA. Muscle relaxants and antidepressants are also used. (11: 1571)

Then comes the role of the rehabilitation program, which must be organized in and out of the hospital on a case-by-case basis and according to its seriousness. (12 : 396)

Rehabilitation is an attempt to restore the full function of an injured organ or part and depends largely on the proper identification, evaluation, and treatment of the cause of the injury. And return to meet the requirements of everyday life naturally. (13 : 35)

Exercise is a very important factor in treating patients after a stroke, helping patients to rely on themselves and spend a lot of daily work such as walking, eating, cleaning, dressing, etc.

Experts around the world confirm that medications are given to patients after injury to help prevent the appearance of blood clots again, but do not help to return movement to normal again as they stressed that exercise is an important aspect of treatment, and the need to start physical therapy from the first glance, and put the patient in the right position during sleep, and by placing a bag of sand under the foot to prevent falling and the outer side of the thigh also to prevent it from drifting to Outside, which may lead to a future shortening of the thigh muscles, they added that the day after the injury should start compulsive therapeutic exercises to move the joints, prevent them from stiffness, and try to remind the brain of the form of movement.

Therefore, the patient can sit or move to stand with the help of facilities after training, and sometimes some electrical exercises are added to maintain the muscle tone and muscle cohesion and prevent atrophy, and when the condition begins to improve it is possible to increase some splints for the injured hand and foot to prevent shortness or deformation of joints or short muscles. Walking and training through the use of parallel rails in front of a mirror or using hydrotherapy. The patient can be trained to move and walk in a medical pool with the possibility to push the patient, seating chairs, and parallel beams for walking training.

Hydrotherapy also plays an important role in pushing the patient to move and helping weak muscles by floating from the bottom up. Heat treatment helps relax muscles in cases of stiffness in some muscles and some tensile exercises of these muscles and try to prevent their constriction and put splints in sleep situations to tighten shrinking and stiff muscles.

(2 : 276 – 277)

Hydrotherapy means the use of water in all ways for therapeutic purposes, and depends on the principle that water is the most important element of good health, and the basic function of this treatment is to pump heat and cold to cause a mechanical and chemical alert to effect therapeutic effect, and is used as a means of preparation and warm-up and aiding various therapeutic exercises, where it affects the surface of the body and internal organs and on circulation and body temperature, and also has a positive effect on metabolism, nervous system, blood components and endocrine secretions in addition to psychological effect, as well as psychological impact, as well as psychological impact. Heat has a positive energy activity in the body and affects the microcell components of electrons and ions.

Hydrotherapy includes all external means of using liquids for treatment, water is the best type of fluid because of its ease of change from image to image and transports heat and cold to the human body, in addition

to its superior ability to absorb and leak the regulated heat, and hydrotherapy is included in the range of alternative medical treatments that use water to relieve the severity of some diseases and relieve pain or to clean the gut from toxins and food waste, as well as use hydrotherapy in treatment programs containing elongation exercises Strengthening, balance, walking training and manual treatment for patient rehabilitation.

Hydrotherapy needs expertise and training to complete the treatment session safely and effectively and hydrotherapy also uses exercise in swimming pools and for multiple purposes and in the treatment of many injuries where it depends on exposure to flows of cold water and vet to stimulate circulation and strengthen the body, and some substances or herbs can be added to increase its therapeutic effect and usually use multiple types of herbs after heating to treat pain because they are highly effective in relieving pain, as well as uses the flow of herbs after heating to treat pain. Hot and cold water stimulates activity in the body, as well as the use of a "herbal sauna" where the body is immersed in a thick layer of green herbs, represents a hot cover and this leads to the body's detoxification and helps strengthen the immune system. (3 : 20)

Restoring motor functions and making the patient more independent in his daily life and self-reliance by performing daily activity exercises that facilitate the patient's return to normalcy and better life, aims to restore functional independence in daily activities by improving skills performance deficits (strength and mobility ROM, muscle control, cognition) or teaching compensatory strategies to recover performance deficits. (14 : 100)

Flexibility: Flexibility means the joint's ability to move freely through the full range of movement and flex means bending, flexibility means rubber flexibility, and muscular flexibility means muscle flexibility in the sense of muscle's ability to rubber as far as possible. (4 : 243)

The brain is divided into the following main parts:

- 1- Cerebrum Brain
- 2- Cerebellum Cerebellum
- 3- Brain Stem Brain Stem (15)

- **Brain:**

Divided into the left and right hemispheres of the brain by a deep longitudinal incision, the hemispheres of the brain keep in touch and communicate with each other through the body. (16)

- **Cerebellum:**

It consists of the cerebellum cortex and the deep cerebellum noun, and the cerebellum cortex consists of three layers:

- Molecular layers
- Perksji layers
- Granular layers

The cerebellum is associated with the brain stem by structures known as cerebellum legs. The primary function of the brain is to modify motor coordination, posture, and balance. It also controls the coordination of voluntary movement, receives sensory information from the brain and spinal cord and controls the accuracy of motor activity, and helps with cognitive functions such as attention, language, pleasure response, and fear regulation.

- **Brain stem:**

Containing the middle brain, bridge, and marrow, located between the base of the brain and spinal cord, the brain stem acts as a bridge connecting the brain and cerebellum to the spinal cord and has the main centers for performing involuntary functions such as breathing, temperature, heart rate, wakefulness cycles, sleep, coughing, sneezing, digestion, vomiting and swallowing.

Sensory neurons bring sensory inputs from the body to the thalamus, and sensory information is then transmitted to the brain through the thalamus. Hunger, thirst, and sleep are under the control of the hypothalamus region.

Motor and sensory neurons that descend from the brain to the other side of the brain stem cross. This transit means that the right side of the brain controls the motor and sensory functions of the left side of the body, while the left side of the brain controls the motor and sensory functions of the right side of the body, so a stroke that affects the left cerebral half, for example, will show motor and sensory disability on the right side of the body. (17)

Brain homography: -

Blood flows into the brain through four basic blood vessels, including two vertebral arteries and two sebaceous arteries, and the two vertebral arteries enter the skull through the spine and provide the brain stem and cerebellum mainly with blood. In return, the carotid arteries enter the skull from the front of the neck and provide the hemispheres with blood mainly, and the four arteries meet in a semi-circle form, contributing to

maintaining a proper flow of blood in the event of blockage of an artery, but unfortunately, the effectiveness of the circle of arteries varies from person to person, often differently. Do not protect people from stroke symptoms if one of the main arteries is blocked. (5 : 9)

Stroke or Cerebrovascular accident

The brain controls body movement, processes information from the outside world, enables us to communicate with others, and stroke occurs when part of the brain stops working due to blood flow problems, leading to classic symptoms of stroke, such as sudden weakness in the arm and leg on the same side of the body. The brain is one of the most accurate parts of the body, so a blood break, even for a very short time, may have catastrophic consequences, for example, although a finger, or even a leg, can be successfully rescued hours after blood feeding stops, the brain is damaged only minutes after such a stop. Symptoms of stroke usually appear quickly and can be very dangerous. (5 : 4)

A stroke **can be defined** as a sudden disorder of the brain's trophic or blood supply, leading to a partial or complete neurological deficit that lasts for more than twenty-four hours, often due to a sudden blockage of one of the brain arteries and in fewer cases the cause of the destruction of one of these arteries leading to hematoma within the brain. (18 : 438)

The main causes of stroke: -

The brain uses large amounts of oxygen and nutrients (such as glucose), which reach it through circulation, and the most common cause of stroke is the blockage of a blood vessel that supplies the brain with these basic nutrients due to a blood clot, known as a blood clot, which forms locally in a cerebral artery or elsewhere (e.g. in the heart) and crosses the bloodstream to reach the brain.

This type of mobile clotting is known as embolism, as it coordinates a blood vessel in the brain, and soon deprives the brain cells that feed them of oxygen and glucose and stops working properly, and if the blood flow does not resume quickly, those brain cells die, and this type of stroke is known as embolic stroke, or (brain infarction) and embolic means lack of blood, while infarction indicates the death of part of the body.

The second most common cause of strokes is cerebral bleeding, which occurs when a blood vessel explodes in the head, and in addition to being hampered by the flow of oxygen and glucose to some areas of the brain, leaking blood can cause clotting, swelling, or infections. (5: 9 -11)

Injury-affected joints: -

- 1- Shoulder joint.
- 2- Elbow joint.
- 3- Hand joints.
- 4- Thigh joint.
- 5- Knee joint.
- 6- Ankle joint.

First: Shoulder Joint: (The Shoulder Joint)

It is a free-moving synovial joint in the human body (ball type and right) and the joint consists of the separation of the hinge surface of the head of the humerus with the bony hole of the bone of the scapula, which is not deep, so the possibilities of the joint in the movement were very large, but this free movement often causes dislocation of the joint because of the lack of depth of the bony hole and the lack of proof of the head of the humerus inside it only to a small extent, and the weakness and weakness of the fibrous wallet. Especially on the human side of the head of the humerus from the bottom and surrounds the joint surface of the bony pit a cartilage lip, called the bony lip, which increases the depth of this hole and increases its joint surface, and in the case of life the head of the humerus covers smooth cartilage to facilitate movement and prevent friction.

Shoulder joint movements: The shoulder is the only joint in the human body where you find the shoulder as it performs many important functions and functions in humans. Movements are clear and free and, in all directions, this is very necessary for detail.

His movements are:

- **Catch the humerus forward: you will be given the following muscles:** (great pectoral muscle, Deltoid muscle (front of it), coracobrachialis muscle, the muscle under the scapula, as well as humerus biceps) .
- **Stretch the humerus back: the following muscles do so:** (great round muscle, middle round muscle, broad dorsal muscle, sub-shoulder muscle, three-headed humerus muscle) .
- **The humerus is far from the torso: the following muscles do so:** (The muscle above the scapula where the humerus is 30 degrees away from the torso, the middle fiber, the Deltoid muscle where it completes its distance to 90 degrees).

▪ **Join the humerus and bring it closer to the torso:**

(subboard muscle, sub-fork muscle, small and large round, great pectoral muscle, broad dorsal muscle, humerus ravenous muscle, humerus biceps).

▪ **Forgotten twisting: The following muscles are performed by:**

(bone pectoral muscle, broad dorsal muscle, large round muscle, muscle under board) .

▪ **Winding for brutality: The following muscles do so:**

(Muscle under the fork, large and small round, rear fibers of the functioning muscle).

▪ **Rotation:** The sum of previous movements, the muscles that make these movements cooperate in the rotation movement. (6 : 122- 125)

Second: The Elbow Joint Annex Joint

The joint of the attachment is considered an essential type of free joint that is found within the body and is called a mono-axle joint where the movement takes place at one vacuum level, i.e. it is of the type of resonant and the importance of the joint also comes in terms of the fact that one of the joints characterized by a special form of movement, which was called by anatomists arrest and numerators where these functions are two basic functions of this joint, and the possible movements of the joint of movements characterized by difficulty and complexity and therefore The muscular strengthening of this group of joints is extremely complex because of the muscles working on it and its presence in several layers, the simplicity of interpreting the movement of any joint comes from the simplicity of strengthening the composition of this joint. (7 : 38)

Third: Hand joints

The detailed bones are the lower surface of the Kaaba bone with the upper surface of the wrist bone.

Joint type: Zelali has two transverse axes and a rear front axis.

Movements allowed by the joint:

- 1- the dome is moving the hand forward.
- 2- The rug is to move the hand back.
- 3- Distance and approximation are to round the hand towards the body and keep it away from it.

Wrist joints: -

Movements allowed by joints:

- 1- captured as he moved the fingers forward.
- 2- rug as it moves back.

3- dimensions and rounding the average finger in the hand.

Salamiat joints: -

Movements allowed by joints:

- 1- captured as he moved the salamies forward.
- 2- The rug is to move the salamies back. (8 : 70)

Fourth The hip joint:

It is one of the synovial joints of the type (ball and acetabulum), while the ball is the head of the femur, and the acetabulum is the cavity of the iliac acetabulum in the non-naming bone. Fatty at the bottom of the acetabular fossa reduces trauma to the femur, and the ligament of the head of the femur is attached to this fat pad. The hip joint is one of the strongest joints in the human body, and it is less prone to dislocation than the shoulder joint and more stable than it is.

The movements that he can make are:-

- 1 - grip: grip the thigh to the abdomen, which is a free movement.
- 2- Extension: the opposite of grip, ie, stretching the thigh back, which is a limited movement.
- 3- Adduction: rounding the thigh and bringing it to the medial.
- 4- Abduction: abduction of the thigh to the lateral aspect.
- 5- Lapping for the femur.
- 6- Lapping for brutality.
- 7- Rotation: This occurs from the sum of the previous movements. (6 : 130 ,134)

Fifth Knee Joint:

The knee joint is the largest syntax in the human body, consisting of the lower end of the femur separated from the upper end of the kasbah bone, as well as the back surface of the buttock bone with the front surface of the end of the femur, a large, complex joint with a salient purse, and is a single-axis flat joint with strong ligaments and muscles, so dislocation has rarely occurred.

Movements made by the knee joint:

The knee joint is a single-axle joint and therefore has two main movements: capture and numerator movement:

A.Arrest: i.e., the leg catches and joins the thigh, and the following muscles are done: femoral biceps, biceps, tendon, membrane and chromatism, and aortic muscle.

B. **Rug:** I.e., make the leg straight on the thigh and it happens after the arrested movement and does so: the thigh muscle with four heads.

When the leg is placed at a right angle with the thigh, the leg can be rotated to humanity and brutality (to a small degree).

Laps for humanity: with muscles: preparation, membrane half, sewing, semi-tendon muscle.

Winding for brutality: by the femoral biceps.

Sixth The Ankle Joint

It is a strong syllable joint, preserved by strong fibrous ligaments, tendons surrounded by each side to stabilize and preserve, and the broken bones overlap with each other in an increase in joint stabilization.

The joint consists of the separation of the upper, human and brutal surface of the removed bone with the lower ends of the kasbah and fragment bone, the hinge surface of the vault concave, and the removed bone enters this cavity, thereby increasing the strength of the joint's safety.

The Movements made by the ankle joint:

The joint e around accidentally mov one axis ,and the king makes only two moves: capture and numerator.

A. **Clutch:** i.e. lowering the foot down with the following muscles: twin muscle, learning muscle, as well as posterior bronchial muscle, holding long fingers and holding the thumb, as well as long and short splinter muscles.

B. **Rug:** Reverse the grip any foot lift and do so: long and basset for the thumb. Anterior bronchial muscle, the third fragment, as well as the best muscle of the fingers.

When the joint is in position, i.e., the foot down, the joint can make a side movement.

The Purpose of the study:

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Design a water rehabilitation program to improve the motor capacity of the left part of the body for clot patients and recognize the degree of response to the functional efficiency change of the affected joints.

Study assignments:

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- 1- There are statistically significant differences between tribal and remote measurements of some functional efficiency variables of the wounded joints of the left and right part of the body for clot patients and distance measurements.

2- There are no statistically significant differences in distance measurements in some functional efficiency variables of infected joints between the injured left incision and the healthy right incision of the body for clot patients.

Determining study terms: -

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1- Cerebral stroke: "It is a sudden neurological disorder due to the interruption of blood access to the brain."

2- Rehabilitation program: "A selection of exercises to treat or correct a deviation from normal state resulted in the loss or disability of a member from performing the full function of him to help this member return to his or her normal state or approach it to do his job."

3- Rehabilitative exercises: "A method of motor physical therapy that does its part to maintain the health and fitness of the injured individual by reducing complications of vital organs."

Exercises Aquatic: "A variety of physical and recreational exercises for all parts of the body are carried out in a water center taking advantage of the properties (buoyancy- resistance - water pressure) which gives positive motivations to a practitioner."

Study procedures:

Method used: -

The researcher used the experimental method on one experimental group by conducting a pre- and measurement-post for the same group due to its suitability to the nature of this study.

Fields of Study: -

Research community:

The human field of the study includes (10) women with stroke affecting the left side of the body, whose ages range between (40: 55), who attend the Natural Medicine and Rheumatology Hospital of the Armed Forces in Agouza.

Time Domain:

The tribal exams were started in the time period from (5/5/2021): (13/5/2021), then the basic study was started in the time period between (15/5/2021) to (12/15/2021).

Research sample: -

The research community included (10) women with stroke (stroke) affecting the left side of the body, and their ages ranged between (40: 55).

Sample characteristics:

1- Of the women with stroke (infarction) affecting the left side of the body, their number was (10).

- 2- Their ages range between (40: 55).
- 3- They are chosen intentionally.
- 4- Injury for the first time.
- 5- Recent injuries.
- 6- They have not received any rehabilitation treatments before.
- 7- Not suffering from diseases that conflict with the program and the nature of its application and its measurements.
- 8- That the research sample matches the research community.
- 9- Agree to participate in the proposed program.
- 10- Regular attendance at the sessions.
- 11- Make sure your health is stable

The therapeutic unit model for each stage of the implemented rehabilitation program

The content of the implemented treatment program

How to implement the implemented qualifying program

The researcher designed the program through reference research and review of studies related to the topic of research and the use of the opinions of experts and specialists in determining the appropriate exercises, the time period of the program and the number of its stages, as well as the objectives of each stage and the number of rehabilitation units appropriate to the disease under research and based on the foregoing, the proposed rehabilitation and water exercise program was developed As follows:-

The duration of the program is (28) weeks, with (3) rehabilitation units per week. The duration of the treatment unit is (45: 65) minutes, with a rate of (15: 20) minutes for land exercises, and from (30: 45) minutes for water exercises. This proposal was submitted to a group of experts specialized in motor rehabilitation programs to express their opinions on this proposal, and in light of this, the rehabilitation program was implemented.

First, the first stage:





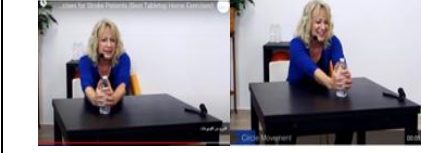

aimed at:

- 1- Reducing pain and reducing swelling and infiltration.
- 2- Raising the functional efficiency of the affected joints by activating the nerves and muscles surrounding the injury and trying to restore the motor memory.
- 3- This stage also aimed to increase the range of motion of the joints through exercises and the positive assistance of the researcher.



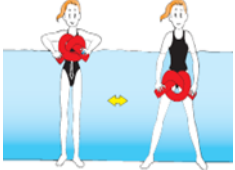

The severity of pregnancy at that stage was between simple and less than average, and this stage lasted for 6 weeks with 18 treatment units. This

stage contains exercises with a fixed rhythm in order to suit them with the pathological condition of the sample under consideration at this stage.

• **Some qualifying exercises for the first stage: -**

Illustration of the exercise	training load			Suggested exercise	
	Comforts	Repetition	intensity		
Ground floor exercises:					
	10s	3 sets	15	(sitting on a chair) Lift the knee up with the help of the hands	1
	5s	3 sets	10	(Sitting on a chair) Put the wrist of the affected foot on top of the wrist of the other foot and raise it up and down again	2
	5s	2 sets	15	(Sitting on a chair) Rotate the torso to the right while tightening the body with the hands placed on the thigh	3
	5s	2 sets	15	(Sitting in a chair) Trunk tilt to the right and then to the left	4
	10s	3 sets	20	(Sitting on a chair) The hands are intertwined and the arms are wrapped in circles in front of the body	5
	15s	3 sets	20	(Standing) bending and straightening the fingers and repetition without tension	6





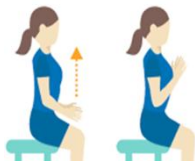
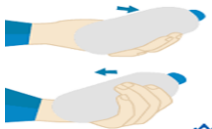
First stage aquatic exercises:






	10s	3 sets	10	(Standing) the arms in front, then move to the side and back and repeat	7
	5s	5 sets	2	Walk the front quickly with noodles around the torso from the front for resistance	8
	5s	2 sets	10	(Standing) Holding the knotted noodle, the arms are straightened and the feet are separated, then the arms are bent, with the feet joined and repetition	9
	10s	3 sets	10	(Standing on one foot) The free foot makes a right angle between the thigh and the leg, and below the instep, a swimming noodle is placed and pressed	10

Second, the second stage:**Aimed at: -**

- 1- Stimulating blood circulation and developing the muscle strength of the muscles working on the affected areas.
- 2- Increasing the range of motion of the affected joints.
- 3- Development of fixed muscular work in different angles of the muscles affected by the injury.
- 4- Performing moving exercises of gradual intensity.
- 5- Starting exercises with gradient intensity resistance, and performing exercises with auxiliary equipment.

The intensity of pregnancy at this stage is between less than average and medium. This phase lasted for 12 weeks, with 36 treatment units.

Illustration of the exercise	training load			Suggested exercise	
	Comforts	Repetition	intensity		
Ground floor exercises:					
	5s	3 sets	15	(Sit tall) Tighten the instep through a belt to lengthen the .muscles of the legs	1
	5s	3 sets	20	(Sitting on a chair) pressing the turntable forward and backward, then inward and outward, then rotating inward and .outward	2
	5s	2 sets	30	(Standing) raising the thigh of one of the feet forward to make a right angle with the leg	3
	5s	3 sets	30s	(Standing) the arms in front of the fingers of one hand pointing down and stretched with the other hand.	4
	5s	3 sets	20	(Standing or sitting) interlocking the palms and raising them until they touch the chest and lowering them again.	5
	5s	3 sets	20	Grab a plastic bottle and squeeze it with your fingers, then stop pressing and then go back to pressing again	6



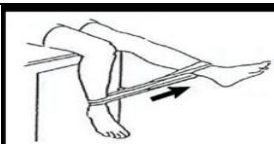







aquatic exercises:					
	5s	3 sets	20	(Standing on one foot) and the leg of the free foot over the noodles while continuing to press it down. Then switch to the other foot	7
	5s	3 sets	30	Floating on the back with the help of noodles and coach, feet apart, and then joined again	8
	5s	3 sets	25	(Standing) pressing the swimming board with the feet down and then back up again and repeating and then pressing outward and inward	9
	10s	2 sets	30	(Standing) Grasp the barbells in front of the body and press them down, then raise again and repeat	10
	5s	2 sets	20	Hold the fingers of the hand, then spread them apart	11


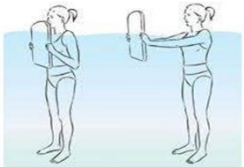

Third, the third stage: -

Aimed at: -

- 1- Restore the strength of the joints affected by the injury, and the muscles working on them.
- 2- Attempting to reach the affected joints to their normal state, and also trying to reach a state of full recovery by achieving flexibility and muscle strength, and then returning to normal life activities.
- 3- Reaching the lowest possible degree of pain in the places of injury.

The intensity of pregnancy at this stage is between maximum and less than maximum. The duration of this phase was 7 weeks, with 21 treatment units.

Illustration of the exercise	training load			Suggested exercise	
	Comforts	Repetition	intensity		
Ground floor exercises:					
	10s	3 sets	20	(lying) Tighten the instep of the foot forward and backward using the rubber .resistance elastic	1
	3s	1 sets	5	(Standing) Walking on .tiptoes	2
	10s	3 sets	25	(Sit on a chair) straighten the leg forward using rubber .resistance elastic	3
	10s	3 sets	30	(Standing) moving one foot back and fixing the other .using the resistance stick	4
	10s	3 sets	30	(Sitting tall) Bend the knees and fix the resistance bands on them and pull through .the arms	5
	5s	1 sets	60s	Using clay to move the fingers of the hands and the .muscles of the palms	6
	10s	3 sets	20	Press on the iron handle .positioned in the form	7
	5s	3 sets	20	Tighten the rubber designated for the fingers .positioned in the form	8
aquatic exercises:					
	15s	3 sets	30	(Standing) jogging sideways in place with the .knees raised forward	9
	15s	3 sets	30	(Standing) Jumping with the knees bent and the two hamstrings touching the .pool wall together	10

	10s	3 sets	30	(Standing) Raise the outer knee of the foot to draw the thigh and leg at a right angle, then kick forward through the straightening of the leg	11
	10s	3 sets	30	(Standing) Hold the swimming board in front of the body, then pull back, then push forward again	12
	10s	3 sets	30	(Standing open) alternate pushing the water dumbbell with the arms forward	13

View results: -

Table (1)
Indication of differences between tribal and remote measurements of the left part of the body for clot patients in functional efficiency variables of infected joints

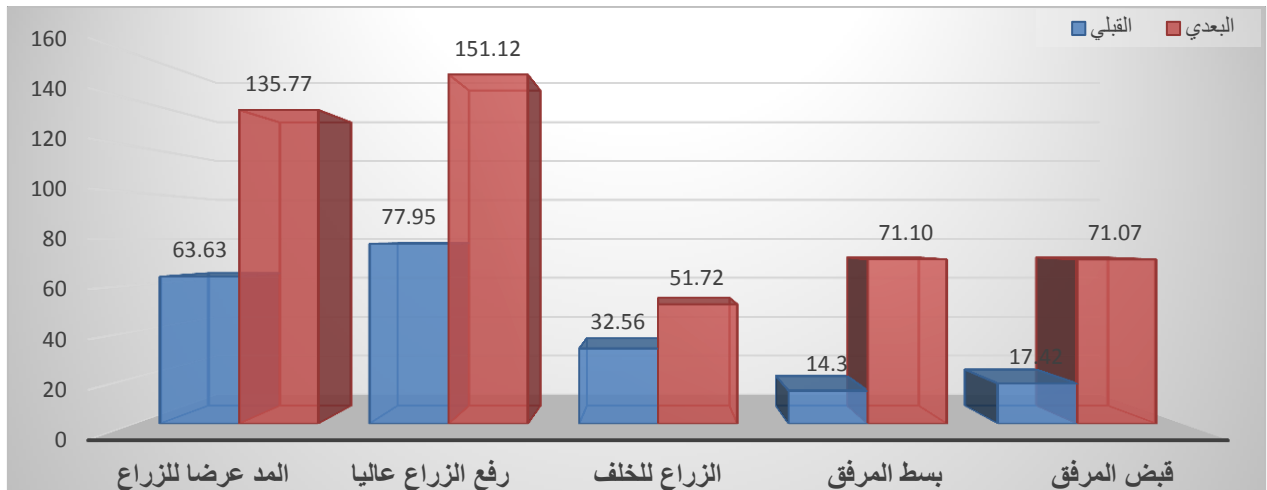
(N =01)

Variables	unit scaling	Tribal		Post		troupe s	t	P (value)	Rate of improvement
		\bar{X}	S	\bar{X}	S				
The tide is a view of the arm.	degree	63.63	15.77	135.77	7.17	72.14	-23.43*	0.00	113%
Raise the arm high.	degree	77.95	8.91	151.12	8.98	73.17	-45.70*	0.00	94%
Arm back.	degree	32.56	5.29	51.72	2.55	19.16	-14.03*	0.00	59%
Extension of facility	degree	14.3	3.12	71.10	4.67	56.80	-35.11*	0.00	397%
Catch the attachment	degree	17.42	4.37	71.07	4.99	53.65	-21.60*	0.00	308%
To put down the wrist	degree	17.96	3.51	65.93	2.70	47.97	-28.59*	0.00	267%
wrist cap	degree	30.45	15.95	62.19	2.21	31.74	-6.64*	0.00	104%
Far away from the thigh	degree	41.29	2.69	69.67	9.57	28.38	-9.91*	0.00	69%
Thigh forward	degree	45.33	6.46	72.21	2.02	26.88	-11.53*	0.00	59%
Thigh back	degree	28.77	3.45	51.36	2.08	22.59	-16.35*	0.00	79%
Knee bend	degree	43.9	9.75	84.22	3.55	40.32	-18.28*	0.00	92%
Ankle cap	degree	18.28	3.67	34.22	2.34	15.94	-9.88*	0.00	87%

Ankle injury	degree	9.46	2.47	24.64	2.07	15.18	-14.81*	0.00	160%
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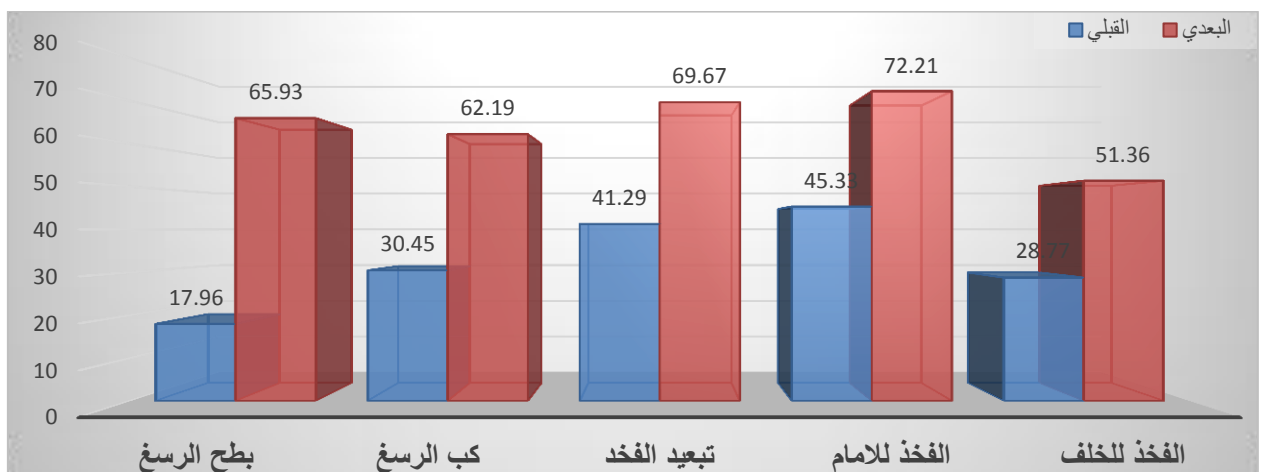
***Indication at the value of (p) ≥ (0.05)**

Table (5) shows statistically significant differences between tribal and remote measurements of the left part of the body for clot patients in the hessian efficiency variables of the affected joints, and the improvement rates are limited to 59%-397%).



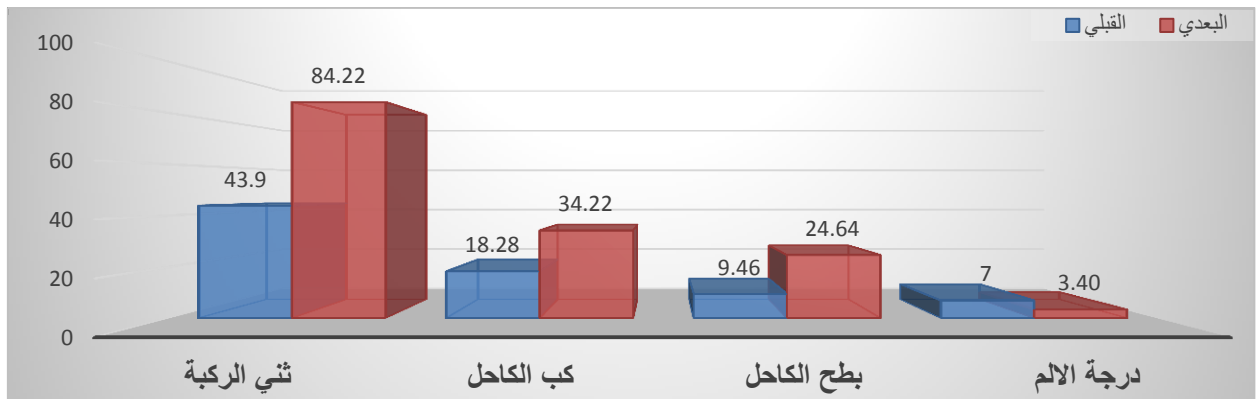
Shape (1)

The mathematical average of tribal and remote measurements of the infected left incision in some variables of functional efficiency of infected joints



Shape (2)

The mathematical average of tribal and remote measurements of the infected left incision in some variables of functional efficiency of infected joints



Shape (3)

The mathematical average of tribal and remote measurements of the injured left incision in some variables of functional efficiency of the affected joints and the degree of pain

Table (2)

Indication of differences between tribal and remote measurements of the healthy right part of the body for clot patients in functional efficiency variables of infected joints

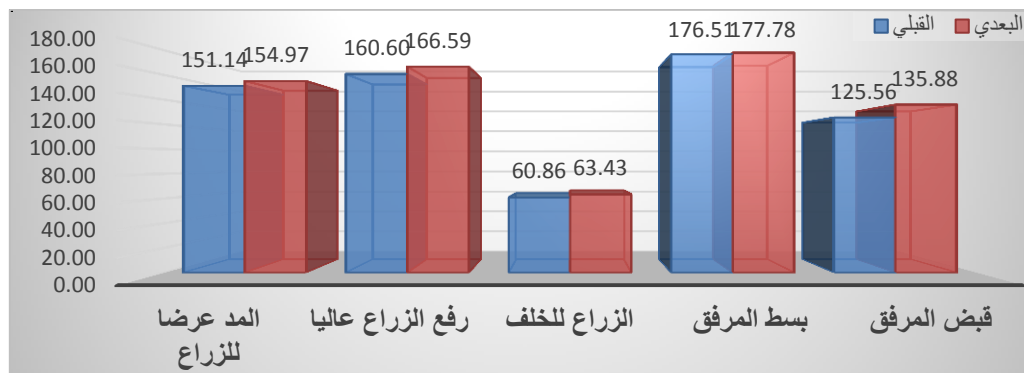
(N =10)

Variables	unit scaling	Tribal		Post		troupe s	t	P (value)	Rate of improven
		\bar{X}	S	\bar{X}	S				
The tide to the side of the	degree	151.14	4.43	154.97	3.96	3.83	-7.85*	0.00	3%
Raise the arm high.	degree	160.60	2.91	166.59	4.32	5.99	-3.90*	0.00	4%
Arm back.	degree	60.86	4.02	63.43	3.81	2.57	-6.43*	0.00	4%
Extension of facility	degree	176.51	1.09	177.78	0.59	1.27	-3.01*	0.04	1%
Catch the attachment	degree	125.56	6.75	135.88	6.42	6.32	-3.47*	0.01	8%
To put down the wrist	degree	79.61	2.10	82.85	1.50	3.24	-5.70*	0.00	4%
wrist cap	degree	83.71	2.55	87.44	1.97	3.73	-4.15*	0.00	4%
Far away from the thigh	degree	71.74	2.11	74.79	1.52	3.05	-6.97*	0.00	4%
Thigh forward	degree	80.42	2.90	83.69	2.65	3.27	-10.18*	0.00	4%
Thigh back	degree	55.96	2.57	58.56	2.49	2.60	-7.53*	0.00	5%

Knee bend	degree	96.48	2.35	101.03	2.59	4.55	-6.36*	0.00	5%
Ankle cap	degree	42.73	1.89	45.87	1.70	3.14	-18.12*	0.00	7%
Ankle injury	degree	34.69	2.77	37.48	2.03	2.79	-8.29*	0.00	8%

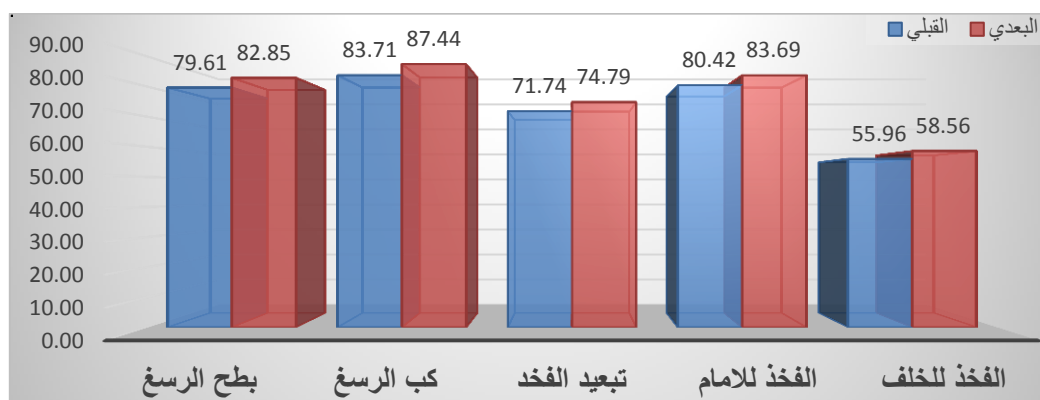
***Indication at the value of (p) \geq (0.05)**

Table (6) shows statistically significant differences between tribal and remote measurements of the healthy right part of the body for clot patients in some variables of functional efficiency of the affected joints, and improvement rates are limited to 1%-8%) and this improvement was caused by the effect of the reflected action of the nerve signals driving the upper and lower limbs.



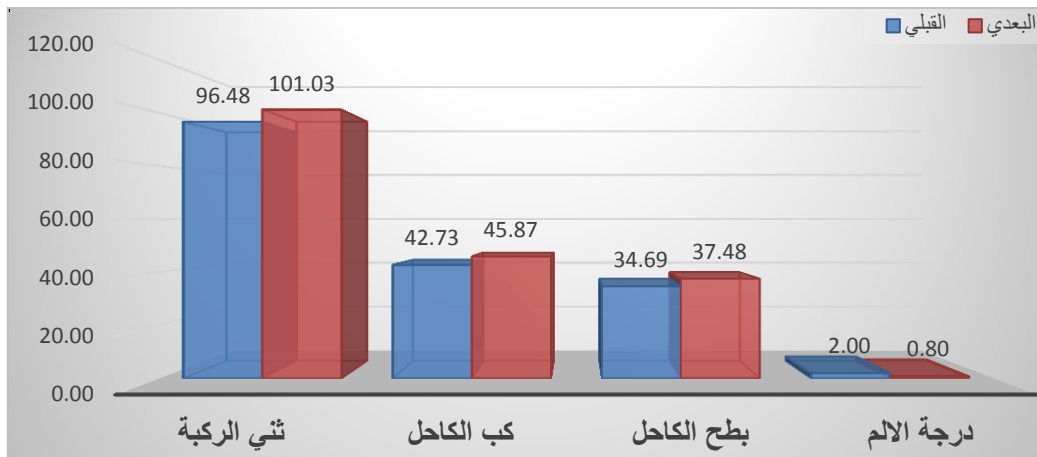
Shape (4)

The mathematical average of tribal and remote measurements of the right incision in some variables of functional efficiency of infected joints



Shape (5)

The mathematical average of tribal and remote measurements of the right incision in some variables of functional efficiency of infected joints



Shape (6)

The computational average of the distance and tribal measurements of the right incision in some variables of functional efficiency of the affected joints and the degree of pain

Table (3)

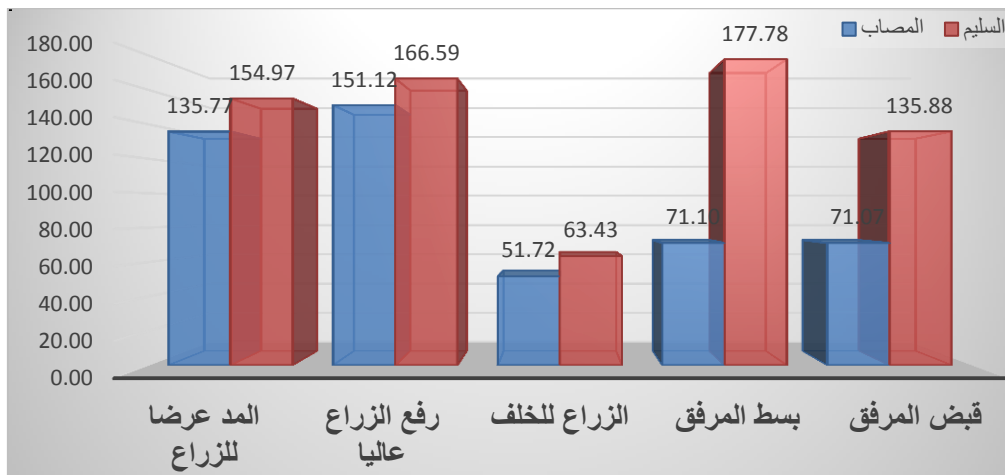
The differences between the left incision and the healthy right incision of the body for clot patients in the functional efficiency variables of the affected joints are indicative

(N =10)

Variables	unit scaling	Injured		Al, Selim		troupes	t	P (value)	The ratio between
		\bar{X}	S	\bar{X}	S				
The tide is a view of the arm.	degree	135.77	7.17	154.97	3.96	19.20	-7.42*	0.00	-14%
Raise the arm high.	degree	151.12	8.98	166.59	4.32	15.47	-4.91*	0.00	10%-
Arm back.	degree	51.72	2.55	63.43	3.81	11.71	-8.08*	0.00	23%-
Extension of facility	degree	71.10	4.67	177.78	0.59	106.68	-33.6*	0.00	150%-
Catch the attachment	degree	71.07	4.99	135.88	19.42	64.81	-10.2*	0.00	91%-
To put down the wrist	degree	65.93	2.70	82.85	1.50	16.92	-17.3*	0.00	26%-
wrist cap	degree	62.19	2.21	87.44	1.97	25.25	-26.9*	0.00	41%-
Far away from the thigh	degree	69.67	9.57	74.79	1.52	5.12	-1.67	0.11	7%-
Thigh forward	degree	72.21	2.02	83.69	2.65	11.48	-10.9*	0.00	16%-
Thigh back	degree	51.36	2.08	58.56	2.49	7.20	-7.01*	0.00	14%-
Knee bend	degree	84.22	3.55	101.03	2.59	16.81	-12.1*	0.00	20%-
Ankle cap	degree	34.22	2.34	45.87	1.70	11.65	-12.7*	0.00	34%-
Ankle injury	degree	24.64	2.07	37.48	2.03	12.84	-14.0*	0.00	52%-

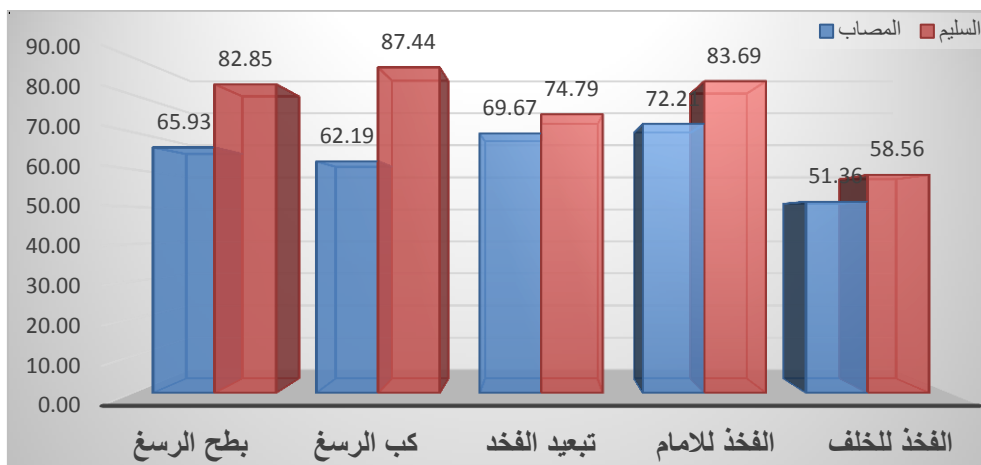
*Indication at the value of (p) \geq (0.05)

Table (7) shows that there are statistically significant differences between the left injured incision and the healthy right incision of the body for clot patients in some variables of functional efficiency of the affected joints, and the absence of statistically significant differences between the distance measurements between the injured left incision and the healthy right incision of the body for clot patients in a variable far away from the trap The improvement rate is limited to -7%)-150%.



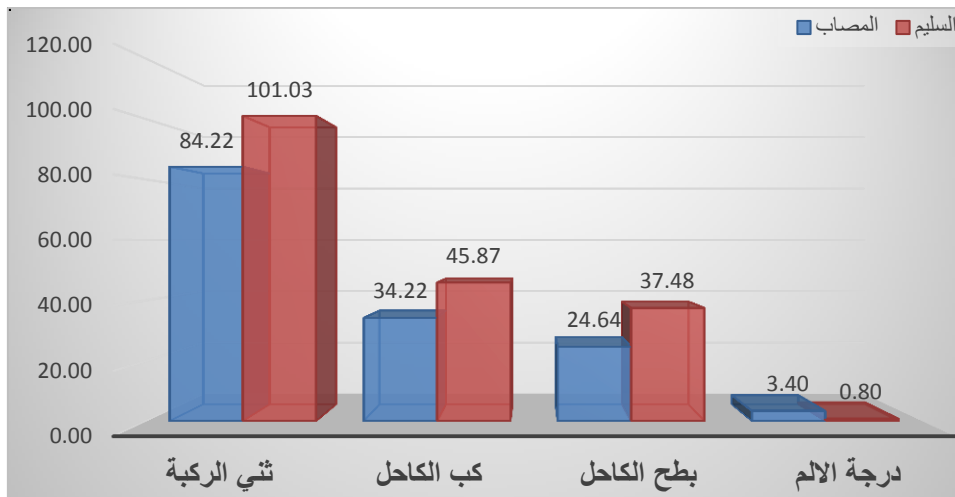
Shape (7)

The computational average of the distance measurements between the injured left incision and the healthy right incision in some variables of functional efficiency of the injured joints



Shape (8)

The computational average of the distance measurements between the injured left incision and the healthy right incision in some variables of functional efficiency of the injured joints



Shape (9)

The computational average of the distance measurements between the injured left incision and the healthy right incision in some variables of functional efficiency of the injured joints and the degree of pain

Second: Discussion of the results: -

❖ Discuss the results of functional efficiency variables for injury-affected joints.

Table (1) and graphic forms (1, 2, 3) show statistically significant differences between tribal and remote measurements of the injured left incision of the body for stroke patients in functional efficiency variables of injury-affected joints (extended arm width- raising arm high-moving arm backwards - extension of elbow - attachment grip - wrist prostitution - wrist cap- Thigh lengthening - moving the thigh forward - moving the thigh back - bending the knee - ankle cap - ankle injury), the rate of improvement in the variable extended arm casually (113%), the rate of improvement in the arm lift variable (94%), the rate of improvement in the change of moving the arm back (59%), and the rate of improvement in the extension variable attachment (397%) , the rate of improvement in the attachment catch variable (308%), the rate of improvement in the wrist adumer variable (267%), the improvement rate in the wrist cup variant (104%), the improvement rate in the thigh long-distance variable (69%), the rate of improvement in the thigh-moving variable forward (59%), the improvement rate in the thigh-moving variable (79%), the improvement rate in the knee bend variable (92%), and the improvement rate in the ankle cap variable (87%) The rate of improvement in the ankle adumble variable (160%), thus limiting the improvement rates to (59%: 397%).

Table (2) and graphic shapes (4, 5, 6) show statistically significant differences between tribal and remote measurements of the

healthy right part of the body for stroke patients in functional efficiency variables of the joints affected by the injury, extending the arm casually- raising the arm high- moving the arm back- extending the elbow - catching the elbow - prostituting the wrist - the thigh- far away - Moving the thigh forward - moving the thigh backwards - bending the knee - ankle cap - ankle injury), the rate of improvement in the variable extended arm casually (3%), the rate of improvement in the arm lift variable (4%), the rate of improvement in the change of moving the arm back (4%), the rate of improvement in the extension variable elbow (1%), and the rate of improvement in the attachment grip variable (8%) %), the rate of improvement in the wrist acs (4%), the rate of improvement in the wrist cup variant (4%), the rate of improvement in the thigh long-distance variable (4%), the rate of improvement in the variable moving the thigh forward (4%), the rate of improvement in the thigh-moving variable backwards (5%), the rate of improvement in the knee bend variable (5%), and the rate of improvement in the ankle cup variable (7%)), the rate of improvement in the ankle adumble variable (8%), thus limiting the improvement rates between (1%: 8%).

Table (3) and graphic forms (7, 8, 9) show statistically significant differences between the affected left incision and the healthy right incision of the body for clot patients in the functional efficiency variables of the injury-affected joints, (extending the arm casually-raising the arm high- moving the arm back - extending the elbow - catching the elbow - prostituting the wrist - the wrist cap) - Far thigh - moving the thigh forward - moving the thigh back - bending the knee - ankle cap - ankle injury), the ratio between the injured and the healthy in the variable extended arm casually (-14%), the ratio between the injured and the right in the arm lift variable (-10%), and the ratio between the injured and the healthy in the variable moving the arm back (-23%)), the ratio between the injured and the healthy in the facility extension variable (-150%), the ratio between the injured and the healthy in the attachment capture variable (-91%), and the ratio between the injured and the healthy in the wrist injury variable (-26%)), the ratio between the injured and the healthy in the wrist cup variant (-41%), the ratio between the injured and the healthy in the thigh long-term variable (-7%), and the ratio between the injured and the healthy in the variable moving the thigh forward (-16%)), the ratio between the injured and the healthy in the variable moving the thigh back (-14%), the ratio between the injured and the healthy in the knee bend variable (-20%), the ratio between the injured and the healthy in the ankle cup variant (-34%), and the ratio between the injured and the healthy in the

variable ankle adumble (-52%), thus limiting the ratio between the injured and the healthy (-7%) .

The results are in line with a 2010 study by Ali Abdeslam Ali, who noted that the implementation of the program has improved the overall condition of the body and improved the strength and motor and functional efficiency of patients with cerebral palsy.

This is also in line with medhat Qassim's 2004 study. He said he liked the rehabilitation program to contain muscle strength exercises and attention to muscle rubber on the injured side as well as proper.

These results are consistent with the results of many studies such as the study of Osama Riad and Nahid Abdul Rahim (2003) where the application of constant exercises and then gradual use of exercises with the help of the free exercises and then exercises against resistance is of great importance in improving and developing muscle work, and gradually upgrading this resistance to reach the best possible level without any complications.

These results are consistent with those of James (1999) that rehabilitation exercises after injury protect the joints and surrounding ligaments from stiffness and the return of the full motor range of the joint. It also agrees with the results of Bahauddin Salameh (2002) that rehabilitation exercises protect the joints from injury due to the strengthening of the surrounding muscles that work on the joints.

This is also confirmed by the results of Naima Abdessalam Aoun (2011), which confirms that rehabilitation exercises are one of the most important ways to treat contractions and stiffness of joints and maintain the flexibility of the joints to maintain balance and compatibility between the injured party and the right party.

Ahmed Abdeslam (2006) points out that rehabilitation exercises increase joint elasticity and thus increase the motor range of the joint, and increase the elasticity of the muscles working on the joint.

Mohamed Kamal Musa (2004) states that rehabilitation exercises play a major role in increasing the motor range of joints, which is positively reflected in reducing the severity of pain.

This result is consistent with Osama Riad's (2006) reference to the application of constant exercises and then gradual use of assisted exercises, then free exercises, and then resistance exercises that have a significant impact on improving the development of muscle work, to reach the best possible level.

The results of the study "Mohammed Al Sayed" (2009) also indicate that hydrotherapy in the rehabilitation process has an effective impact on the functional efficiency of the injured joints because water exercises lead

to the speed of recovery after surgery and achieve preventive fitness and water reduces the pressures on the body.

The researcher attributes these results to the importance of rehabilitation exercises and the water center that was developed in the program and the speed with which the research sample responds to the impact of these exercises.

Recommendations:-

In light of the research results and conclusions, the researcher recommends the following:

- 1- The speedy start of implementing the proposed rehabilitation programs after consulting a doctor and before reaching the later stages of muscular atrophy and articular stiffness.
- 2- Training the patient on some skills and exercises at home during the three days violating the treatment days, through the case's facilities.
- 3- Spreading awareness of the importance of implementing kinetic rehabilitation programs and their effectiveness in treatment when applied immediately after injury and in consultation with a doctor.
- 4- Spreading awareness of the importance of water rehabilitation programs and the extent of their impact and effectiveness in improving functional efficiency and reducing the degree of pain.
- 5- Be guided by the proposed rehabilitation program when rehabilitating stroke cases.
- 6- Supporting public and private hospitals to implement such rehabilitation programs because of their high effectiveness.
- 7- Encouraging the research sample to continue applying the sequential rehabilitation programs to prevent relapse and recurrence of pain.
- 8- Spreading cultural awareness to community members on how to deal with a stroke patient.

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