# Assessment of Musculoskeletal Complications for Immobilized Stroke Patients atAssiut UniversityHospital

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**Abstract:**Stroke is a leading cause of disability.
**The study aimed to:** assess musculoskeletal complications for immobilized stroke patients.
**Methods:** Descriptive research design carried out in AssiutUniversityhospital.It included30 patientsconducted at neurological departmentsatAssiut University Hospital.
**Tools:**Data collected by using three tools; Firsttool: part I;includedSociodemographic patient characteristics, part II;assessment of the past and present health history, second toolincluded: Assessment of patient's knowledge regarding stroke and musculoskeletal complications resulting from immobility,while the third toolincluded patient's assessment for the musculoskeletal complications.
**The main results of present study** The incidences of musculoskeletal complications in studied sample were higheramong the stroke immobilized patient and hadunsatisfactory knowledge regarding to stroke.
**It concluded that:**The majority of store immobilized patients after prolonged immobilization suffer from sever musculoskeletal complications and had unsatisfactory knowledge.
**It was recommended that:**the exercise programme should be applying early as possible as from at time of admission to the hospital.
**Key words:** Assessment, Stroke patients, Musculoskeletal Complications, Assiut University.

## I.    Introduction:

A stroke, previously known as a cerebrovascular accident (CVA), is the rapidly developing loss of brain functions due to disturbance in the blood supply to the brain. It can be due to ischemia caused as thrombosis or embolism, or to hemorrhage **(Sims, 2010).**

Stroke is the third leading cause of death and the leading cause of adult disability in United States. Approximately 780,000 Americans experience strokes each year, resulting in the death of approximately 136,000 people annually. An additional 200,000 to 500,000 individuals experience a transient ischemic attacks (TIA). The economic effect of stroke is estimated to be more than $60 billion each year. Approximately 5,500,000 Americans are stroke survivors. Stroke is considered one of the most preventable of catastrophic events in United States. Acute care and rehabilitation of stroke patients is a long and expensive process. More than half of stroke victims acquire independence in activities of daily living (ADL) within 1 year after the stroke. Thirty percent of stroke survivors return to work and productive lives within 1 year (**Lina, 2012**).

Cerebrovascular disease (stroke) is the second most common cause of death and among the top five causes of morbidity in many developed and developing countries the burden of stroke in developing countries has grown to epidemic proportions. Two-thirds of global stroke occurs in low- and middle-income countries. We have found that little information is obtainable concerning the availability of thrombolysis therapy in developing countries (**Masoud et al., 2012**). The incidence of acute cerebrovascular stroke was highly significant in males compared to females. Acute cerebrovascular stroke was highly associated with hypertension, diabetes mellitus, smoking and atrial fibrillation, the incidence of cerebral infarction was highly significantthanintracranialhemorrhage. There was an increase in the incidence of cerebralinfarctionwith the increase in age in a significantway. Alsotherewasadecrease in the incidence of intracranialhemorrhagewith the increase in age in a significantway. (**Ayman et al., 2011).**

There isconsiderableloss of strengthwhena muscle is put at rest. This occursevenwithrelatively short periods of immobility. Witheachday of bedrestthereis as much as 3% loss of muscle strength, or up to 20% loss of residualstrength per week of immobilization. Lowerextremity muscles losetheirstrength about twice as fast as upperextremity muscles (**Mullar.,1970**).

Disuse of the muscles leads to atrophy and a loss of muscle strength at a rate of around 12% aweek. After 3–5 weeks of bedrest, almosthalf the normal strength of a muscle islost (**Jiricka, 2008**).

This means that there can be as much as a 50% loss of muscle strength in as little as 3 weeks of bed rest. Unfortunately, subsequent recovery of strength proceeds at a much slower pace. Once immobilization has ceased, the most rapid rate of strength recovery is approximately 10% per week.26 Thus, it is farmore efficient to prevent loss of strength secondary to immobilization. Prevention will have important ramifications on the speed at which injuredsoldiers can be returned to duty(**Mullar.,1970**).

Patient recovering from stroke often require a multidisciplinary home health care team to regain activities of daily living. The nursing care is integrated with other health care professionals to meet patient goals for optimal outcome, with the nurse assuming the role as case manger or team leader (**Rice, 2006**). Helping the patient to cope with the squeal following the stroke, adjusting to the home environment, and gaining independence can be hampered by problems with immobility, musculoskeletal function, altered nutrition, altered elimination, skin integrity, and altered sensation. A combination of these problems creates a high risk for injury. Altered cognition compounds the patient's inability for self care and patient teaching, especially if the patient has residual confusion, following the stroke event (**Mallik et al., 2004 & Hsueh   et al., 2003**).

## II.     Significance of the study

Stroke patients are exposed to numerous attended risks and complications due to immobility. The most obvious effect is seen in the musculoskeletal system, with loss of muscles strength. A loss of muscle strength at arate of around 12% aweek.  After 3–5 weeks of bedrest, almosthalf the normal strength of a muscle islost .Very limited studies were conducted about musculoskeletal complications due to immobility for stroke immobilized stroke patients, so there is a need for stroke education to detect early cases and prevent complication.

## III.     Materials and Methods:

**Study design:**
Descriptiveresearch design was used in this study.

**Study settings:**
The study was conducted at Neurological departments and Neurological outpatient clinic and physiotherapy unite of Assiut University Hospital.

**Sample:**
**Study subjects:**
The study will include a convenience sample of 30 adult immobile patients' stroke (17male and 13 female) from time of admission in the department .Those patients observed until the time discharge from ahospital. The study sample numbers 30 patients who will receive routine care of a hospital.
Selected according to the following criteria:
1.  The age ranged between 18-65 years old.
2.  Recent admission to hospital.
3.  Any type of stroke (ischemic or hemorrhagic).

**Tools of the study:**
Interviewing questionnaire was developed by the researcher for the data collection. It was based on review of relevant literatures this questionnaire composed of three tools as follow:
**Tool (1): Patient's health needs assessment sheet:** This tool consists of two parts:
**Part I:Demographic characteristics of study patients:** Itincludedsociodemographic patient characteristics for a stroke immobilized patients which consisted of: patient's name, age, gender, level of education, occupation, patient's diagnosis, admission date, discharge date and length of stay.

**PartII:Patient's health assessment:**
This part used assessment of the past and present health history; which consisted of:history, onset, type, causes of stroke, associated diseases, affected paralytic side.

**Tool (2):Knowledge of thestroke patient about stroke:**
This part used to assess patients' knowledge regarding stroke.This part used to assess and evaluate knowledge of the studied sample. Total score of knowledge were (12). Using score system for knowledge, a correct response was scored (1) grade and zero for the incorrect(Unsatisfactory = score < 50%, satisfactory score ≥ 50%).

**Study phases:**
**Tool (3):Patient's Assessment sheet for the musculoskeletal complications.**

It was used to assess expected complications that might develop among stroke immobilized patients admitted to neurological department Muscles atrophy, aches or pains in the muscles, muscle spasticity (↑ tone), muscles flaccid (↓ tone), limited ROM, stiff joints, painful hemiplegic shoulder, shoulder subluxation, knee flexion contracture, foot drop, toe curling and finger curling.

## IV. Methods:

**The study was conducted through:**

- Data were collected at Neurological departments and Neurological outpatient clinic of Assiut University Hospital during the period from August 2014 to January 2015.
- An official permission was obtained from the head of Neurological department at Assiut University Hospital.
- The study tools were formulated after review of literature.
- The content validity was done by 5 expertises in the medical surgical nursing field and orthopedic field.
- Patient's agreement for voluntary participation was obtained after the purpose and nature of the study were explained.
- Data were assured confidentiality and anonymity and were collected using the pre-mentioned study tools.
- A pilot study was conducted on 10% (3) of patients to examine the feasibility of the study and clarity of the tools.
- The study was carried during the evening shift for all available patients.
- The tools were all filled through interviewing. The purpose of the study was explained to the patients prior to the answering the questions.
- After assessment of the patients needs by**(tool 1 and tool 2)**.
- Before the patient's discharge from the hospital assess the patient for musculoskeletal complications resulting from immobility**(using tool 3).**

## V. Results:
**Table (1):Socio-demographic characteristic of the study group**

| Variables | No. (n= 30) | % |
|---|---|---|
| **Age:** | | |
| 18 - 30 years | 1 | 3.3 |
| 31 - 45 years | 5 | 16.7 |
| 46+ years | 24 | 80 |
| Mean ± SD (Range) | 53.7±9.9 (27 – 65) | |
| **Sex:** | | |
| Male | 17 | 56.7 |
| Female | 13 | 43.3 |
| **Level of education:** | | |
| High education | 4 | 13.3 |
| Secondary education | 5 | 16.7 |
| Read and write | 6 | 20.0 |
| Illiterate | 15 | 50.0 |
| **Occupation:** | | |
| House wife | 14 | 46.7 |
| Farmer | 10 | 33.3 |
| Employee | 2 | 6.7 |
| Not work | 4 | 13.3 |
| **Patients Diagnosis**: | | |
| Cerberalhaemorrhage | 8 | 26.7 |
| Cerberal Infarction | 22 | 73.3 |

**Table (2):** Assessment of the past and present health history

| Variables | No. (n= 30) | % |
|---|---|---|
| **Number of attack recurrence:** | | |
| First time | 25 | 83.3 |
| Recurrent stroke | 5 | 16.7 |
| **Causes of stroke:** | | |
| Atherosclerosis | 1 | 3.3 |
| Atrial fibrillation | 2 | 6.7 |
| Diabetes mellitus | 0 | 0.0 |
| Heart disease | 1 | 3.3 |
| Hyperlipidemia | 0 | 0.0 |
| Hypertension | 26 | 86.7 |
| Unknown | 1 | 3.3 |
| **Affected paralytic side:** | | |
| Right | 12 | 40.0 |
| Left | 18 | 60.0 |
| **Health history:** | | |
| Family history of stroke | 5 | 16.7 |
| High blood pressure | 25 | 83.3 |
| Heart disease | 8 | 26.7 |
| Hyperlipidemia | 4 | 13.3 |
| Smoking cigarettes | 6 | 20.0 |
| Diabetic patient | 14 | 46.7 |
| Obesity and overweight | 0 | 0.0 |
| **Types of stroke:** | | |
| Ischemic stroke | 22 | 73.3 |
| Hemorrhagic stroke | 8 | 26.7 |

**Table (3):** Patients' knowledge about definition, causes, risk factors and complications of immobility

| Variables | Correct | | Incorrect | |
|---|---|---|---|---|
| | No= 30 | % | No= 30 | % |
| **Definition of stroke:** | 1 | 3.3 | 29 | 96.7 |
| **The most common causes of stroke:** | | | | |
| Haemorrhage | 7 | 23.3 | 23 | 76.7 |
| Infarction | 1 | 3.3 | 29 | 96.7 |
| **modifiable risk factors for stroke:** | | | | |
| Hypertension | 0 | 0.0 | 30 | 100.0 |
| Aging | 2 | 6.7 | 28 | 93.3 |
| Heredity factor | 7 | 23.3 | 23 | 76.7 |
| **Is it possible topreventorreduce the incidence ofstrokeagain** | 4 | 13.3 | 26 | 86.7 |
| **What are the symptomspriorto theoccurrence ofstroke?** | | | | |
| Coma | 1 | 3.3 | 29 | 96.7 |
| Convulsion | 0 | 0.0 | 30 | 100.0 |
| Loss of balance | 1 | 3.3 | 29 | 96.7 |
| **What are its components of themusculoskeletal system?** | | | | |
| Muscles and bones | 4 | 13.3 | 26 | 86.7 |
| Tendons , ligaments and joints | 0 | 0.0 | 30 | 100.0 |
| **The functions of the musculoskeletal system:** | | | | |
| It works on the stability and balance of body movement | 3 | 10.0 | 27 | 90.0 |
| Protect the body organs | 4 | 13.3 | 26 | 86.7 |
| Distribute the body weight | 0 | 0.0 | 30 | 100.0 |
| **Are there complications resulting from immobility?** | 1 | 3.3 | 29 | 96.7 |
| **Signs and symptoms of the musculoskeletal complications resulting from immobility** | | | | |
| Stiffness and muscle atrophy | 6 | 20.0 | 24 | 80.0 |
| Joint pain | 4 | 13.3 | 26 | 86.7 |
| **Is the foot drop from the musculoskeletal complications that resulting from immobility?** | 0 | 0.0 | 30 | 100.0 |
| **What is footdrop?** | | | | |
| Inability to raise the front part of the foot | 0 | 0.0 | 30 | 100.0 |
| Inability to move the foot | 5 | 16.7 | 25 | 83.3 |
| **Is the footdrop affects walking?** | | | | |
| Dragging foot while walking | 2 | 6.7 | 28 | 93.3 |
| Partridge while walking | 1 | 3.3 | 29 | 96.7 |
| Jump into the top while walking | 1 | 3.3 | 29 | 96.7 |

**Table (4): Assessment for the musculoskeletal complications**

| Variables | No. (n= 30) | % |
|---|---|---|
| Muscles atrophy | 24 | 80.0 |
| Joint pain | 30 | 100.0 |
| Muscle spasticity | 22 | 73.3 |
| Muscle flaccid | 12 | 40.0 |
| Limited ROM | 30 | 100.0 |
| Stiff joints | 30 | 100.0 |
| Painful hemiplegic shoulder | 29 | 96.7 |
| Shoulder subluxation | 2 | 6.7 |
| Knee flexion contracture | 28 | 93.3 |
| Foot drop | 12 | 40.0 |
| Toe curling | 9 | 30.0 |
| Finger curling | 8 | 26.7 |

**Table 1:**This table shows socio demographic characteristics of the studied patients, it was noticed that as regarding to age the less than half ofstudy sample aged between 47– 67 years old. More than half of study samplewere male (56.7%) respectively, as regard level of education; the educational levels of the study sample were illiterate (50%). Looking at the occupation of the study sample the highest percentage was house wife (46.7%). The majority of study sample were having cerebral infarction (73.3%).

**Table 2:**This table demonstrates that two third of study sample suffered from first stroke occurrence (83.3%). As regard to the causes of stroke the highest percentage of study group suffered from hypertension (86.7%). The left side was most affected paralytic side which occur with the highest percentage for study sample (, 60%).According to health history the majority of study sample suffered from high blood pressure (80%).

**Table 3:**This table revealed that knowledge about definition; causes, risk factors, warning signs of stroke from 3.3% of the studied sample know stroke. As regard tothe components of the musculoskeletal system, functions of the musculoskeletal system, the complications resulting from immobility and signs and symptoms of the musculoskeletal complications resulting from immobility ranged from 26% to 30%, the vast majority from 25% to 30% of the studied sample don't know definition of foot drop, If the foot dropaffect on walking and it considered from the musculoskeletal complications.

**Table 4:**illustrates that; musculoskeletal complications developed early from a time of admission to a hospital ; here were thirty patients had joint pain, limited ROM and stiff joint(100%), 21 (80%)had muscles atrophy, whilemuscles spasticity was (73.3%), 29 patients hadpainful hemiplegic shoulder(96.7) ,27patients hadknee flexion contracture(93.3%),but the muscles flaccid and foot drop represents (40%) form a study sample, but toe and finger curling occurred by scant percent was (30% and 26.7%) respectively.

## VI. Discussion:

Cerebrovascular accidents are the third leading cause of death in the United States. Stroke disables two thirds of its survivors; of these, one third is severely impaired. More than half of stroke victims acquire independence in their lives within 1 year after the stroke. Thirty percent of stroke survivors return to work and productive lives within 1 year **(Linton, 2012).**

Concerning the age group of the studied sample it was found that, the majority of patients aged between 47 – 67 years,more than half of study sample (56.7%) were male, the highest percentages were illiterate, house wife, 8 patient (26.7%) had cerberalhaemorrhage and 22 patient (73.3%) had cerberalinfarction.

**According the past and present health history,**it was noticed thatstroke had occurred for the first time in 25 patients (83.3%) and was recurrent 5 (16.7%) patients, this **result don't agree with Runchey and Mcgee, (2010).** Who mentioned that, each year in Germany, 200 000 persons sustain their first stroke, and another 60 000 sustain a stroke after one or more prior strokes; roughly one citizen in five will have a stroke at some time in his or her life,26 (86.7%) of the studied sample were having hypertension andwith health history of high blood pressure 25 (83.3%). in same time, this result similar to **Liao et al., (2009).** who stated that, hypertension is the leading risk factor for stroke and is more prevalent in the southeastern region of the United States. Increased clinical and community action to control hypertension is needed not only to reduce the incidence of stroke but to eliminate disparities in stroke incidence.

In the current study it was observed that the vast majority of patients' had poor knowledge about stroke.These results agreed with **(Kitko, 2008)** research indicated that a vast amount of the public persists with low or no recognition of stroke signs and symptoms, a concern that highlights a real need for enhanced health education measures.

The immobility after stroke is associated with changes in muscle due to adaptive mechanical and morphological changes in muscle fibers **(Carr., 2003 and farmer.,2001).**

# VII.    Conclusion:

The immobile stroke patients experience with musculoskeletal complications due to prolonged immobility.

# VIII.    Recommendations:

Recommendations for prescribing exercise for stroke survivors across all stages of recovery. Structured exercise sessions whereby exercises could be demonstrated by a rehabilitation specialist or exercise leader **(Banks.,2012).**

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