

## Post Stroke Shoulder Pain Problem

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### ABSTRACT:

#### BACKGROUND:

Shoulder pain is one of the complications that happened in patient suffered of hemiplegia our aim is to study this problem in hemiplegics patients due to stroke

#### METHODS:

56 patients affected by different types of stroke were enrolled in this study , each patient was examined by neurologist , CT scan then done and referred to a consultant rheumatologist at Alkindi hospital for assessment of his shoulder area , the patient then investigated thoroughly for his or her shoulder pain

#### RESULTS AND CONCLUSION :

The study showed high correlation between shoulder pain and older age patients, aphasia, cortical sensory defects

The study showed that the frozen shoulder is the commonest cause of post stroke shoulder pain

**KEY WORD:** shoulder pain, stroke .

### INTRODUCTION:

Stroke is sudden neurological dysfunction, resulting from sudden vascular insult involving cerebral vessels(1); it is either ischemic due to cessation of blood supply to the brain (2), or hemorrhagic stroke; due to different types of intracranial hemorrhage (2) (3). Shoulder pain is very common problem facing the neurologist when managing patients with stroke (4); 20 – 70% of patient with stroke develop hemiplegic shoulder pain (5) (6). Shoulder pain affects stroke outcome in a negative way. It can cause considerable distress , reduced activity and can markedly hinder rehabilitation resulting in negative interference with recovery after stroke (7,8). The cause of hemiplegic shoulder pain is the subject of considerable controversy (8). There are many pathological processes have been postulated as causes of painful hemiplegic shoulder after stroke. One of the causes is Rotator cuff syndrome, which results from impinging of rotator cuff tendon between acromion and humeral head, resulting in acute pain at the lateral surface of shoulder (9) (10). Other causes of shoulder pain are biceptal tendonitis; which affect large head of biceps resulting in pain at the anterior surface of the shoulder joint (10). Subacromial and sub deltoid Bursitis, which causes pain at lateral aspect of shoulder. Adhesive capsulitis (frozen shoulder) is a common painful condition associated with loss of active movement in the direction of external rotation and abduction

(10). Other causes include glenohumeral sub luxation (11) soft tissue trauma (12) Brachial plexus traction Neuropathy (13) and central cortical post stroke mechanism may play a role (7). The aim of this study is to analyze this complaint and its correlation with the different clinical aspects of cerebral dysfunction .

#### PATIENTS AND METHODS :

56 patients; aged from 29 – 73 years; suffered from stroke with hemiplegia during the first(6) months post stroke were studied at Alkindi teaching hospital, between January 2004 – June 2005 , all the patients had CT scan of the brain at the onset of the stroke ; the patient was classified into ischemic or hemorrhagic stroke according to CT scan results. Patients with Ischemic heart disease ,with diabetes mellitus and with any joint problems were excluded from the study; the neurologist took Full history in details and examined the patient neurologically to diagnose and localize his neurological deficit. Speech was assessed in all patients according to the steps of speech examination published in Bickerstaff *Neurological examination in clinical practice* (14 ) which includes:

- 1- spontaneous speech assessment
- 2-comprehension
- 3-naming objects
- 4-repetition
- 5-reading
- 6- writing) the patients with left sided weakness were examined for cortical sensory loss ; astereognosis was examined by asking ability to identify 2

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centimeter cube object and 2 centimeter circumference ball we use this a little pit large sizes because of paralysis of the hand and poor hand grip (14).graphesthesia was assessed by drawing the Arabic shape of number 9 and 2 on the patient palm using pencil . sensory inattention assessed by ability to recognize simultaneous stimuli on both sides of the body the abnormal response is when the patient can recognize only the sound right side of the body at simultaneous stimulation and normal response of both side when examined separately ;the patients with aphasia did not involved in cortical sensory examination because of barrier of difficult communication . Muscle power grading was assessed according to medical research counsel scale (MRC)of great British which recorded the power in 6 grades(15) the patients then referred to rheumatologist who examined the patient. The patient had full blood count, blood sugar, ECG, Chest X-ray, Cervical X-ray and Shoulder X-ray, electromyography /nerve conduction study were done by the examining neurologist ; the rheumatologist at last diagnosed the cause of the shoulder pain P value < 0.05 was considered significant and was used whenever applied.

**RESULTS :**

56 patients aged from 29 – 73 years; with stroke suffering from shoulder pain were studied; 29 patients had ischemic stroke and 27 had hemorrhagic stroke (intra cerebral hemorrhage). 17 of those with ischemic stroke were female (58.6%) and 12 out of 29 were male (41.4%). (tab. 1) .10 out of 27 patients with intracerebral hemorrhage were female (37%) and 17 were males (63%). (Tab. 1) .23 patients out of 56 aged above 60 years; 18 patients aged between 51-60 years; 10 patients ages were between 41-50 years; 3 patients’ ages were between 31-40 years and 1 patient was 29 years old age. (Tab. 2) .In patients

with Ischemic stroke No patients had shoulder pain in the first month after stroke, 17 out of the 29 developed the shoulder pain in the second month after ischemic stroke, and 10 patient with ischemic stroke had the shoulder pain in the third month post stroke, one ischemic stroke patient in the 4<sup>th</sup> and one patient in the fifth month. No ischemic stroke patient in the study developed the shoulder pain in the 6<sup>th</sup> month post stroke. (See tab. 3) In hemorrhagic stroke; one patient had the shoulder pain in the first month, 10 patients in the second month, 10 patients in the third month, 4 patients in the fourth month, one patient in the fifth month and one patient in the sixth month after hemorrhagic stroke. (See tab. 3) .Right-sided weakness was seen in 13 out of 29 patients with ischemic stroke (44.8%) the right-sided weakness was seen in 12 out of 27 (44.4%) patients with intra cerebral hemorrhage. (Tab. 4) Left-sided weakness was seen in 16 out of 29 patient with ischemic stroke (45.6%) and seen in 15 out of 27 who had intracerebral hemorrhage (55.6%) (Tab. 5). 15 of the patients with ischemic stroke have grade 0-1 shoulder muscle power 12 patients have grade 2-3 and 2 patients have grade 4 shoulder muscle weakness. Those with hemorrhagic stroke, 17 patients having grade 0-1, 5 patients having grade 2-3 and 5 patients having grade 4 shoulder muscle power. (Tab. 6) . Aphasia was found in 21 out of 25 patients those with right sided weakness, Abnormalities of cortical sensory functions (astreognosis , sensory inattention and graphesthesia) was seen in 27 patients out of 31 patients with left sided weakness. (Tab. 7). 23 patients were diagnosed as frozeed pain from other sites (neck, elbow); 5 patients had direct trauma to the shoulder by fall on ground; 4 patients had shoulder subluxation and 4 patients had rotator cuff syndrome. (Tab. 8)

**Tab (1) male/female ratio having shoulder pain in ischemic and hemorrhagic stroke.**

	Ischemic stroke.	Hemorrhagic stroke.	Total
male	12	17	29
female	17	10	27
total	29	27	56

P= 0.17 no significant

**Tab (2) classification of the patients according to age groups**

≤ 30 years	31- 40 years	41 – 50 years	51 – 61 years	> 60 years
1	3	10	19	23
1.7%	5.3	17.8%	33.8%	41.1%

P= 0.0001 significant

**Tab (3) the time of presentation per month**

	1 <sup>st</sup> month	2 <sup>nd</sup> month	3 <sup>rd</sup> month	4 <sup>th</sup> month	5 <sup>th</sup> month	6 <sup>th</sup> month
Hemorrhagic stroke	1	10	10	4	1	1
Ischemic stroke	0	17	10	1	1	0
	1	27	20	5	2	1

**Tab (4) relation of the shoulder pain to the right side of weakness**

	Ischemic	hemorrhagic	Total
Right. Side weakness	13	12	25
No	16	15	31
Total	29	27	56

P = 0.81 non significant

**Tab (5) relation of the shoulder pain to the left sided weakness to shoulder pain**

	Ischemic.	Hemorrhagic.	Total
Left. Side weak.	16	15	31
No	13	12	25
total	29	27	56

P= 0.81 non significant

**Tab – (6) relation of shoulder muscle power grade to shoulder pain**

	Grad 0 - 1	Grad 2 – 3	Grad – 4	Total
Ischemic .	15	12	2	29
Hemorrhagic.	17	5	5	27
Total	32	17	7	56

P= 0.12 non significant

**Tab – (7) relation of shoulder pain to aphasia and other cortical sensory loss.**

	Yes	No	Total	
Aphasia	21	4	25	P <0.005 significant
Cortical Sensory signs	27	4	31	P <0.005 significant

**Tab (8) causes of shoulder pain**

diagnosis	Frozen shoulder	Referred. pain	Direct trauma	Sub luxation	Rotator cuff
Number of patients	23	20	5	4	4
percentage	41.1%	35.7%	8.9%	7.1%	7.1%

P=0.0001 significant

**DISCUSSION:**

The shoulder pain is very common problem facing the neurologist in the management of patients with stroke (1 – 6). This problem occurs in both types of stroke whether hemorrhagic stroke or Ischemic stroke. The present study showed no significant difference between ischemic stroke and intracerebral hemorrhage in the development of shoulder pain, this agreed with. Other studies Hanukah, Sashama, and Ohkawa etal (5) Anderson (7). The present study

showed an equal male – female occurrence of the shoulder pain in both types of strokes, and this result is in agreement with the results of other studies; Hanukah, Sashmi, Ohkawa etal(5) Anderson study(7), Jeperson .Jogenson (8)and Walsh study(12). The nearly equal male/ female occurrence of shoulder pain with no significance difference between both stroke type in occurrence of shoulder pain; support the opinion that the shoulder pain is

related to the hemiplegia, whatever of its cause and not related to the type of stroke or to the gender difference and this is in agreement with Roy, Sand, Hill study (4) Hanukah, Sashama, Ohkawa et al (5) Anderson (7) Jeperson – Jogenson (8) Chaca, Wolf study (11) and Walsh study (12). In the present study the shoulder pain happened more frequently in elderly than in younger aged group; this correlation with older age, group is related to already diseased joint, as well as less active life style in elderly patients and this agreed with Walsh study (12). The present study showed no significant correlation between weakness side (whether right or left sided weakness) with occurrence of shoulder pain and this is in contrast to Roy, Sand, Hill et al (4) whom found a significant relationship with non-dominant left sided weakness. And in agreement with Walsh who reports no correlation with side of weakness (12). The present study analyze the relation of higher cerebral function, concentrating on aphasia. whatever its type, cortical sensory dysfunction (graphesthesia, astereognosis. and sensory inattention.); We found significant relation between shoulder pain with higher cerebral dysfunction and prove that the patients with cortical involvements are at higher risk for shoulder pain development. This result is agreed with Roy, Sand, Hill et al (4) The study showed that the shoulder pain occurs mostly in the second and third months post stroke in both types of stroke. The present study showed no significant correlation between muscle power grading and the development of the shoulder pain. And this result is contrasting to Roy, Sand, and Hill study (4) Hanukah, Sashama, Ohkawa et al (5) Anderson (7) Jeperson – Jogenson (8) Chaca, Wolf study (11) and Walsh study (12). The study showed that frozen shoulder is the most common cause of the hemiplegics shoulder pain; other causes like referred pain form relatively high percentage (35.7%) from the causes of shoulder pain. Other causes like direct trauma (8.9%) shoulder joint subluxation (7.1%) and rotator cuff syndrome (7.1%). We did not find Brachial plexus traction neuropathy in our patients. Those finding is in contrast to Walsh (12), Braus (13) studies which showed high incidence of shoulder subluxation more than other causes, small sized sample in comparison to those studies may explain the last difference in causes of shoulder pain between the present study and other studies.

#### CONCLUSION:

1) The shoulder pain is very common problem in stroke. 2) The shoulder pain development is more common in older age group. 3) Patients with cortical involvement are at high risk to develop shoulder pain. 4) The shoulder pain development is not related to the side of hemiplegia, sex and grading of muscle weakness. 5) Rheumatologist should examine every patient and plan for early exercise should be encouraged.

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