

Rheumatologic complications of shoulder joint after stroke

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Abstract

Background: Shoulder pain is one of the complications that happened in patient suffered from hemiplegia. There are many pathological processes have been postulated as causes of painful hemiplegics shoulder after stroke. One of the causes is Rotator cuff syndrome. Other causes of shoulder pain are biceptal tendonitis; Subacromial and sub-deltoid Bursitis, Adhesive capsulitis (frozen shoulder) is a common painful condition associated with loss of active movement in the direction of external rotation and abduction.

Objective: The aim of this study is to analyze shoulder pain and its correlation with the different clinical aspects of cerebral dysfunction.

Patients and method: 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 shoulder pain development is more common in older age group. Patients with cortical involvement are at high risk to develop shoulder pain. The shoulder pain development is not related to the side of hemiplegia, sex and grading of muscle weakness.

Key word: shoulder joint, stroke.

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Introduction

Stroke is a 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 hemiplegics shoulder pain^(5, 6).

Shoulder pain affects stroke outcome in a negative way; it can cause considerable distress and reduced activity and can markedly hinder rehabilitation resulting in negative interference with recovery after stroke^(7,8).

The cause of hemiplegics shoulder pain is the subject of considerable controversy⁽⁸⁾. There are many pathological processes have been postulated as causes of painful hemiplegics 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

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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 subluxation⁽¹¹⁾ soft tissue trauma⁽¹²⁾ Brachial plexus traction neuropathy⁽¹³⁾ and central cortical post stroke mechanism may play a role⁽⁷⁾.

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 patients was classified into ischemic or hemorrhagic stroke according to CT scan results; then neurologist took Full history in details and examined the patient neurologically to diagnose and localize his neurological deficit. Speech was assessed in all patients⁽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 centimeter cube object and 2 centimeter circumference ball we use this a little bit 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 council 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 Shoulder X-ray and electromyography /nerve conduction study were done by the examining neurologist; the rheumatologist at last diagnosed the cause of the shoulder pain. Patients with Ischemic heart disease, with diabetes mellitus and with any joint problems were excluded from the study. P value < 0.05 was considered significant and was used whenever applied.

Results

56 patients with stroke suffering from shoulder pain were studied; 29 patients had ischemic stroke and 27 had hemorrhagic stroke (intracerebral hemorrhage). 17 of those with ischemic stroke were female (58.6%) and 12 out of 29 were male (41.4%) (Table 1).

10 out of 27 patients with intracerebral hemorrhage were female (37%) and 17 were males (63%). (Table 1)

23 patients 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. (Table 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 4th and one patient in the fifth month. No ischemic stroke patient in the study developed the shoulder pain in the 6th month post stroke. (Table 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 (Table 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. (Table 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%) (Table 5).

Fifteen 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 (Table 6) .

Aphasia was found in 21 out of 25 patients those with right sided weakness, Abnormalities of cortical sensory functions (astereognosis, sensory inattention and graphesthesia) was seen in 27 patients out of 31 patients with left sided weakness. (Table 7)

Twenty three patients were diagnosed as frozen shoulder; 20 patients were diagnosed as referred 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 (Table 8).

Table 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

Table 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

Table 3: the time of presentation per month

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

Table 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

Table 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

Table 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

Table 7: relation of shoulder pain to aphasia and other cortical sensory loss.

	Yes	No	Total
Aphasia	21	4	25
Cortical Sensory signs	27	4	31

P <0.005 Sig

P <0.005 sig

Table 8: causes of shoulder pain

diagnosis	Frozen shoulder	Referred. pain	Direct trauma	Sub luxation	Rotator cuff
No	23	20	5	4	4
%	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 like Hanukah et al study and Anderson study ^(5,7).

The present study showed an equal male to female ratio of the shoulder pain in both types of strokes, and this result is in agreement with the results of other studies like Hanukah et al, Anderson study, Jeperson. Jogenson study and Walsh study ^(5, 7, 8,12).

The nearly equal male/ female ratio 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 et al study, Hanukah et al study, Anderson study, Jeperson – Jogenson study, Chaca study and Walsh study ^(4,5,7,8,11,12).

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 et al ⁽⁴⁾. Who 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, astreognosis. 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 et al study ⁽⁴⁾.

The study showed that the shoulder pain occurs mostly in the second and third months post stroke in both types of stroke this period may be the time required to clear the effect of muscle stiffness.

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 study ⁽⁴⁾, Hanukah et al study ⁽⁵⁾, Anderson study ⁽⁷⁾,Jeperson – Jogenson study ⁽⁸⁾, Chaca 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 refereed 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 record Brachial plexus traction neuropathy in our patients.

Those finding is in contrast to Walsh ⁽¹²⁾ and 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 to Walsh⁽¹²⁾ and Braus⁽¹³⁾ 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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