

## Prevalence of shoulder subluxation among stroke patients

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**Objective:** To find out the prevalence of shoulder subluxation in post stroke patients.

**Methodology:** This descriptive cross sectional study was conducted at Departments of Medicine and Neurology, PIMS Hospital, Islamabad, Pakistan and included 101 patients recruited via convenience sampling. Clinical measurement procedure via palpation for shoulder subluxation was used for grades of subluxation. "Ritchie Articular Index for Paretic Shoulder Pain" was used for shoulder pain. Data was analysed using SPSS version 16.0

**Results:** Out of 101 participants, 61 (60.4%) were males 40 (39.6%) were females. Mean age of

patients was 56 years. According to Ritchie Articular Index, 28(27.7%) participants had no pain, 24(23.8%) had pain only, 20(19.8%) had pain with wince and 29(28.7%) had pain with wince and withdrawal. For shoulder subluxation, 60(59.4%) participants had no subluxation, 20(19.8%) had minimal subluxation and only 21(20.8%) had substantial subluxation of the shoulder joint.

**Conclusion:** The study showed a prevalence of 47.5% for shoulder subluxation in stroke patients. (Rawal Med J 201;43:257-259).

**Key words:** Stroke, shoulder subluxation, shoulder pain.

### INTRODUCTION

The general risk factors for stroke include hypertension, diabetes, contraceptive use, alcohol usage, polycythemia and atrial fibrillation.<sup>1</sup> Stroke is ranked as the 3rd most communal cause of death worldwide, being next to coronary artery disease and cancer.<sup>2</sup> During the last ten years, the risk for stroke has been amplified in middle to low wage countries by 100%.<sup>3</sup> The under developed and developing countries comprise for more than 80% of stroke related mortality all over the world.<sup>4</sup> In the scenario of the population of Pakistan, the modifiable risk factors, which can contribute to the stroke, are frighteningly amplified.<sup>5</sup>

The alterations in the biomechanical stability and veracity of the shoulder joint or the gleno-humeral joint, resulting in a substantial gap which can be palpated between the bony prominence of the acromian process and the head of the humerus is known as shoulder subluxation.<sup>6</sup> There has been laid a great stress on the management and prevention of subluxation in post-stroke patients, yet it has not been proven in the literature regarding relation between gleno-humeral or shoulder joint pain and

shoulder subluxation.<sup>7</sup> Based on the time and extent of the stroke as well as the diagnostic or assessment tool used, literature suggests an overall incidence of shoulder subluxation ranging from 17-81%.<sup>8</sup> Shoulder subluxation itself can result in numerous negative concerns such as pain in the gleno-humeral joint thus decreased range of motion, and damage to the neurological structures around the gleno-humeral joint and also postponed neurological improvement following the event of stroke.<sup>9</sup> Clinical measurement via palpation for shoulder subluxation and Ritchie Articular index for shoulder pain, both were found to be valid and reliable for assessment of subluxation.<sup>10</sup>

Shoulder pain in Hemiplegia or Hemiplegic Shoulder pain along with shoulder subluxation is one of the most communal outcomes and complications following stroke.<sup>6</sup> Pain in the shoulder joint following stroke can have negative effects on patient prognosis and can lead to marked disability and impairment leading to a limited ability of the patient in achieving their functional maximum capacity and independence, thus limiting overall functional rehabilitation of the patient.<sup>11</sup> The

three most important factors made known in the literature to be related with shoulder pain are the shoulder joint ROM, time since the episode of the cerebrovascular accident, and decreased strength of the muscles of the shoulder.<sup>12</sup> The aim of this study was to determine the prevalence of shoulder subluxation in post stroke patients.

## METHODOLOGY

This descriptive cross sectional study was carried out PIMS Hospital Islamabad, Pakistan for 3-4 months and included 101 post stroke patients selected by Convenience Sampling. Post stroke patients, with age greater than 20 years, patient with stable vital signs in the last 2 days, patients who were oriented, patients who could follow commands and were responsive, patients who could tolerate sitting and patients able to sit without dizziness for at least half an hour were included in the study. Those with severe co-morbidities and medical conditions, spinal cord Injury, post traumatic pain or fracture, recent history of shoulder injury or pain before stroke, history of shoulder subluxation in prior stroke, patients with psychiatric issues, septic arthritis or radiculopathy, dementia, co-existing physical deformity and amputation patients were excluded from the study. An Informed consent was taken from all participants.

Clinical measurement procedure via palpation for Shoulder subluxation: The patients were assessed for shoulder subluxation using "Clinical measurement procedure via palpation for shoulder subluxation" which has been proved to be a reliable instrument for the measurement of shoulder subluxation according to literature. The subluxation was performed with the patient in sitting position, sitting on the corner of the bed or couch, with the affected limb hanging. The assessor used the thumb for palpation of the separation in-between the humeral head and the acromion process. According to Bohannon and Andrews, the subluxation was graded as none=0, minimal=1 and substantial=2.

Ritchie Articular Index for Paretic Shoulder Pain: Pain was assessed using "Ritchie Articular Index for Paretic Shoulder Pain" which has been proved to be a reliable instrument for the measurement of shoulder subluxation according to literature. For

this, external rotation was performed up to ninety degrees and the patient's response was graded as follows: No pain at all=0, only pain=1, pain accompanied with wince=2 and pain and wince accompanied with withdrawal=3. Statistical analysis was done using SPSS version 16.

## RESULTS

Out of 101 participants, 61 (60.4%) were males 40 (39.6%) were females. Age varied between 38 to 72 (mean 56 years). Only 28 (27.7%) participants had no pain, rest had varying degree of pain (Table 1).

**Table 1. Degree of shoulder pain.**

Ritchie Articular Index	Frequency	Percent
No Pain	28	27.7
Complain of Pain	24	23.8
Complain of Pain with Wince	20	19.8
Complain of Pain with Wince and withdrawal	29	28.7
Total	101	100

**Table 2. Grades of shoulder subluxation.**

Grades	Frequency	Percent
None	60	59.4
Minimal	20	19.8
Substantial	21	20.8
Total	101	100

For shoulder subluxation, 60 (59.4%) participants had no subluxation, rest had some subluxation (Table 2).

## DISCUSSION

Our study showed that nearly 60% participants had no subluxation and 40% had some degree of subluxation. A study from Bangkok on 376 stroke patients reported shoulder subluxation prevalence of 37%, whereas only 19% participants had pain in the shoulder.<sup>13</sup> Another study on 24 participants with stroke showed that 15 had no subluxation, 5 had minimal and 4 had significant subluxation.<sup>17</sup> In our study, 19.6% participants had minimal subluxation and 20.8% had substantial subluxation of the shoulder joint.

A study from Bangladesh on 35 subjects concluded that 22 (62.85%) had shoulder subluxation and 7

(31.82%) participants who had shoulder subluxation were between 53-60 years age. 12 (54.55%) participants had hemorrhagic stroke among stroke patients who had shoulder subluxation.<sup>14</sup> A study in 2005 on Glenohumeral subluxation in hemiplegia concluded radiographic measurements as a useful screening tool and functional electrical stimulation and strapping were considered effective measure in preventing glenohumeral subluxation.<sup>8</sup>

A study from Italy on shoulder subluxation after stroke on 107 hemiplegic adults concluded that glenohumeral subluxation was present in 52 (48.6%) patients and correlated significantly to shoulder pain at admission, discharge and after discharge.<sup>15</sup> Limitations of our study include a small sample size for the conclusions to be generalized. Further research is needed to make the results more generalized.

## CONCLUSION

Our study showed a prevalence of 47.5% for shoulder subluxation in stroke patients.

### Author Contributions:

Conception and design: ShehlaGul  
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Analysis and interpretation of the data: Nasir Khan  
Drafting of the article: ShehlaGul  
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