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EDITORIAL

THE REHABILITATION JOURNAL (TRJ)

On behalf of the entire editorial board, I am delighted to inform you that we are releasing a new multidisciplinary International Journal named 'The Rehabilitation Journal' (TRJ), which will be an open access, peer reviewed, and online journal. This journal will cover all topics related to medical rehabilitation including but not limited to musculoskeletal rehabilitation, neurological rehabilitation, cardiopulmonary rehabilitation, sports rehabilitation, psychosocial rehabilitation, speech and language rehabilitation and community based rehabilitation etc.

The primary aim of TRJ is to provide the readers with a platform to access high quality research associated with rehabilitation, which will not only deliver scientific basis to the clinicians for evidence-based practice but also promote rehabilitation research with the aim of improvising the existing research with new ideas and bridging the gaps. We intend to build up an international base of the journal and therefore encourage authors from all around the world to participate and make their work published in an International refereed journal. We ensure strict adherence to International guidelines of reviewing to maintain a high standard of an international journal.

Every manuscript submitted to TRJ, which falls under the umbrella term of Rehabilitation, will go through a basic process of scrutinizing by the related associate editors, and then will be sent to experts in the relative field for a detailed review. Based on the comments and recommendations made by the reviewers, the final decision will be made by the managing editor.

The most distinct feature of TRJ is continuous publication of articles online after acceptance without waiting for a sufficient number of articles for an issue. The review time will be regularly monitored by the editorial board to ensure faster publications avoiding any unnecessary delay.

Other features include the provision of open access and online tracking of the status of manuscript. Open access research articles provide fast and efficient sharing of the findings across the globe. This also ensures high quality work to help influence rehabilitation practice in the shortest possible time to the broadest possible population of scientific researchers.

Finally, I would like to pay my sincerest gratitude to entire editorial board for their continuous hard work behind launching of this journal.

We hope that you will enjoy reading this new journal and contribute to make it an international platform for sharing good quality work in all fields of rehabilitation.

HINA TARIQ

Managing Editor, TRJ

ORIGINAL ARTICLE

EFFECTIVENESS OF GRADE I, II KALTENBORN MOBILIZATION IN STAGE I ADHESIVE CAPSULITIS

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Rabnawaz Khan³: Collection, analysis & interpretation of data, Revised and Accountable for all aspects

Shafqatullah Abro⁴: Collection, analysis & interpretation of data, Revised and Accountable for all aspects

Abstract

Objectives: To determine the effectiveness of grade I and II Kaltenborn mobilization in treating stage I adhesive Capsulitis. **Material & Methods:** The study design was Randomized Controlled Trial. In which two groups were formed. One was Group A and second was Group B. In Group A for adhesive capsulitis stage I, Keltonborne mobilization Grade I&II was performed along with TENS, Hopsacks & Home Exercises Plan. In Group B TENS, Hot packs and Home Exercise Plan was introduced. The study was conducted in physiotherapy department BBH, Rawalpindi. The study was conducted for six months after the approval of topic by ASRC Isra University Islamabad. Sample size chosen was 60 patients and 30 patients were included in each group. Non probability Purposive Sampling technique was used collect the samples. The data was collected through the following questionnaires. The data collection also consisted of Quick DASH part-I with 11-items and Quick DASH work-module with 4 questions, which measured level of pain severity and level of difficulty. Data was analyzed through SPSS IBM 20. Baseline data was described in form of frequency table and bar charts, mean and standard deviation. **Results:** The result showed significant difference within and between the Group A and Group B after intervention. The result the p-value= ≤0.05 in quick DASH questionnaire. **Conclusion:** The results of the study concluded that Hot pack, TENS and home exercises with or with keltonborne grade 1&2 are both effective for management of symptoms of stage 1 adhesive capsulitis. But Hotpack, TENS and home exercise plan with keltonborne mobilization grade 1&2 significantly improve in term of treatment duration and symptoms reduction

Keywords: Adhesive capsulitis, Keltonborne manual mobilization, Quick DASH, TENS, Hot pack, Home exercise plan

INTRODUCTION

Adhesive capsulitis is characterized by a painful, gradual loss of both active and passive glenohumeral motion resulting from progressive fibrosis and ultimate contracture of the glenohumeral joint capsule.¹ The prevalence of the adhesive capsulitis in diabetics is 3-4% to 20%.² Some studies suggested that adhesive capsulitis is self limiting condition and resolve itself within 3 years but most of studies suggested that adhesive capsulitis affect ROM in 30-55% patient up to 5 years.³ Adhesive capsulitis is more prevalent in women than men after 50 years of age.⁴ But some studies suggested its occurrence bilaterally in 40-50% patients.⁵

The adhesive capsulitis on the basis of clinical presentation mainly have three stages. The first stages is freezing stage. it is also called painful stage.⁶ The painful stage (stage I) involves gradually increasing pain and stiffness and lasts between three and eight months also characterized by synovitis of shoulder joint.⁷ Most of the patients progress to the second stage, called the frozen or transitional stage.⁸ In the second stage ROM is limited marked but pain intensity do not increase. The duration of this stage is 4-12months.¹⁰ The third stage of adhesive capsulitis is thawing stage during this stage ROM of shoulder joint is

going to improve and this stage last from 12-42 months and characterized by returning of the shoulder joint movement.¹¹

As stage I progress the condition become worse with more pain and limitation in AROM & PROM of shoulder joint.¹² Stage 1 of adhesive capsulitis mimics the impingement syndrome of the shoulder.¹³ Muscle spasms in the trapezius also commonly occur during this phase.¹³ A history of a minor strain or injury before onset may be noted; however, it is unclear whether the initial strain is an independent phenomenon or an early awareness of the pain associated with the onset of adhesive capsulitis.^{14,22}

The OMT Kaltenborn-Evjenth Concept is the result of many years of collaboration between physical therapists and physicians, first in the Nordic countries from 1954 to 1970, and then worldwide.¹⁵ In kaltenborn classification system, a concept of management in which accessory and physiologic passive movements of the joints are applied at various grades of intensity depending on subject's pain and joint stiffness.¹⁶ A vital component of the kaltenborn approach is that the treatment is based on constant assessment and reassessment with subsequent individual modification of treatment techniques.¹⁷ KM involves the application of a passive sustained stretch technique to enhance joint mobility without articular surface suppression.¹⁸ The forces applied to increase joint mobility

are graded from I-III. Grade I applies a distraction of minor intensity that hardly causes stress within the joint capsule; it is often used to decrease pain.¹⁹ Grade II refers to a force that stretches the periarticular tissue; such stimulus is colloquially referred to as "taking up the slack."²⁰ Finally, Grade III force causes enough distraction or gliding so that joint capsule can sufficiently stretch; it is often used for enhancing ROM.²¹

There was limited literature found on effectiveness of grade I&II mobilization in stage I adhesive capsulitis. The studies have also shown that electrotherapy is effective, but the studies have not compared the effectiveness of treatments together on rehabilitation outcomes in Pakistan. So the need arises to carry out the study with Kaltenborn mobilization and electrotherapy versus electrotherapy. The current study is designed to evaluate the effectiveness of Grade I and II Kaltenborn mobilizations of gleno-humeral joint in treating acute adhesive capsulitis of the GH joint in comparison to electrotherapy.

MATERIAL & METHODS:

The study design was Randomized Controlled Trial. In which two groups were formed. One is Group A and second was Group B. In Group A for adhesive capsulitis stage I, Keltonborne mobilization Grade I&II was performed along with TENS, Hot packs & Home Exercises Plan. In Group B TENS, Hot packs and Home Exercise Plan was introduced. The study was conducted in physiotherapy department, BBH, Rawalpindi. Permission for study was also taken from ethical committee of BBH. Sample size chosen was 60 patients, 30 patients were randomly allocated in each group. Non probability Purposive Sampling technique were used collect the samples. Patients between the age 35-70 years, patients having purely stage I adhesive Capsulitis, both male and female genders were included in the study. Patients having diabetes, chronic osteoarthritis and with history of fracture & dislocation around shoulder joint were excluded.

The data was collected through General demographic questionnaire including age, gender, BMI, dominant arm and Occupation and also through Quick DASH part-I with 11-items and Quick DASH work-module with 4 questions, which measured level of pain severity and level of difficulty. Data was analyzed through SPSS IBM 20. Baseline data was described in form of frequency table and bar charts, mean and standard deviation. Group comparison was conducted by paired sample t-test. In which pre and post test comparison of both group was conducted and describe by mean standard deviation and significant difference was calculated by p-value ≤ 0.05 .

The subjects received series of six consecutive physiotherapy sessions for two weeks of almost 45 minutes in duration. The sessions were administered by a physical therapist. The sessions were included TENS, which was applied for 10minutes over the shoulder; Hot pack for 10 minutes over the painful area of shoulder was applied. Home exercises plan included general range of motion exercises, pendular and wall walking exercises, 10 repetitions of each exercise 2 times per day was suggested.

Each session started by asking the patients about the symptoms and limitation under DASH Quick Questionnaire. After session last 15 minutes included a review of exercises and awareness of positional patterns and movements of the arm for at home and occupational settings. The last portion of session included a verbal and visual review of client's status. In Group A, additionally Keltonborne Grade 1&2 mobilizations were used in patients with supine position, distraction gliding was performed in abduction, extension, internal rotation and flexion to improve symptoms of stage I adhesive capsulitis for about 10-15minutes

RESULTS

The patients in both groups were similar in terms of the age, gender, dominant arm and duration of the main complaints and outcome measure of base line value. (Table 1) The mean age in group A was 58.90 ± 6.03 and in group B was 56.50 ± 6.61 .

Table 1: General Demographic of Subjects

		Groups		n(%)
		A	B	
Age	41-50	1	5	6(10%)
	51-60	15	15	30(50%)
	Above 60	14	10	24(40%)
Gender	Male	14	13	27(45%)
	Female	16	17	33(55%)
Dominant Arm	Right	26	27	53(88.3%)
	Left	4	3	7(11.7%)

In our sample there were 14 male in group A and 13 males in group B and 10 females in group A and 13 females in group B. 10% of the sample lied in age category of 41-50, 50% of sample in 51-60 and 40% above 60 years of age. 53 patients had dominant right arm and only 7 patients had dominant left arm. The descriptive statistics regarding Quick DASH questionnaire for within the group Pre & Post comparison of group A & B has been given in Table 2 & 3 and results of between the groups A & B comparison has been given in Table 4. All the variables assessed to evaluate the effectiveness of treatment methodology in group A showed significant difference as can be seen by the p-values except for a few variables like cutting food, social

activities and tingling which had p-values 0.08, 0.08 and 0.16 respectively. (Table 2) In group B all the variables showed significant difference except for social activities and tingling with p-values 0.66 and 0.16 respectively. (Table 3)

Table 2: Comparison within the Group A (Pre & Post) , n=30

		Mean	SD	p-value
Carry a shopping bag or briefcase	Pre	2.60	0.49	0.00
	Post	2.26	0.73	
Cut food.	Pre	1.10	0.30	0.08
	Post	1.00	0.00	
Doing your usual work because of shoulder	Pre	2.16	0.37	0.00
	Post	1.23	0.50	
Doing your work as well as you would like?	Pre	2.16	0.37	0.00
	Post	1.23	0.50	
Heavy Household	Pre	1.26	0.44	0.00
	Post	1.83	0.69	
Open a jar	Pre	1.60	0.77	0.01
	Post	1.40	0.62	
Pain	Pre	1.66	0.75	0.00
	Post	1.23	0.50	
Recreational activities	Pre	1.83	0.69	0.00
	Post	1.30	0.53	
Sleeping	Pre	2.33	0.47	0.00
	Post	1.23	0.50	
Social activities	Pre	1.16	0.37	0.08
	Post	1.06	0.25	
Spending your usual amount of time doing your work	Pre	2.80	0.40	0.00
	Post	1.56	0.62	
Tingling	Pre	1.10	0.30	0.16
	Post	1.03	0.18	
Using your usual technique for your work?	Pre	2.33	0.47	0.00
	Post	1.56	0.62	
Wash your back	Pre	2.86	0.73	0.00
	Post	1.60	0.72	
Work or other regular activities	Pre	3.36	0.55	0.00
	Post	2.03	1.12	

When comparing the post values for both the groups A and B it can be clearly observed that the mean values for the group A are less as compared to group B which showed that Keltenborn mobilization along with electrotherapy is more effective than electrotherapy only for treatment of stage I adhesive capsulitis. A few of variables have non-significant p values such as cutting food with p-value not applicable and SD 0.00, opening jar with p-value 0.69 and SD 0.62 in group A and 0.68 in group B, pain with p-value of 0.15 and SD 0.50 in group A and 0.56 in group B, social activities with p-value 0.39 and SD 0.25

in group A and 0.34 in group B and tingling with p-value not applicable and SD of 0.18 in group A and B. (Table 4)

Table 3: Comparison within the Group B (Pre & Post) , n=30

		Mean	SD	p-value
Carry a shopping bag or briefcase	Pre	1.60	0.77	0.05
	Post	1.43	0.67	
Cut food.	Pre	1.10	0.30	0.08
	Post	1.00	0.00	
Doing your usual work because of shoulder pain	Pre	2.17	0.37	0.02
	Post	2.00	0.52	
Doing your work as well as you would like?	Pre	2.16	0.37	0.04
	Post	2.03	0.49	
Heavy Household	Pre	1.633	0.55	0.03
	Post	1.83	0.69	
Open a jar	Pre	1.60	0.77	0.04
	Post	1.46	0.68	
Pain	Pre	1.66	0.75	0.03
	Post	1.43	0.56	
Recreational activities	Pre	1.83	0.69	0.01
	Post	1.53	0.57	
Sleeping	Pre	2.26	0.44	0.02
	Post	2.10	0.40	
Social activities	Pre	1.16	0.37	0.66
	Post	1.13	0.34	
Spending your usual amount of time doing your work	Pre	2.80	0.40	0.02
	Post	2.63	0.55	
Tingling	Pre	1.10	0.30	0.16
	Post	1.03	0.18	
Using your usual technique for your work?	Pre	2.33	0.47	0.00
	Post	2.033	0.66	
Wash your back	Pre	2.80	0.40	0.03
	Post	2.60	0.62	
Work or other regular activities	Pre	2.80	0.40	0.02
	Post	2.63	0.61	

DISCUSSION

There are several studies conducted which reported the effectiveness of joint mobilization in improving joint pain and ROM in subacute and chronic stages.^{23,24,25,26} But in this study keltonborne mobilization grade 1&2 were used to manage pain and discomfort in acute stage of adhesive capsulitis. The study showed improvement in the both groups but in post intervention group comparison significant difference in improvement of symptoms Group A (Keltonborn 1&2) as compared to Group B (without Keltonborn 1&2).

Table 4: Comparison between the Group A & B (Post) , n=60

	Groups	Mean	SD	p-value
Carry a shopping bag or briefcase	A	2.26	0.73	0.00
	B	1.43	0.67	
Cut food.	A	1.00	0.00 ^a	N/A
	B	1.00	0.00 ^a	
Doing your usual work because of shoulder pain	A	1.23	0.50	0.00
	B	2.00	0.52	
Doing your work as well as you would like?	A	1.23	0.50	0.00
	B	2.03	0.49	
Heavy Household	A	1.26	0.44	0.00
	B	1.63	0.55	
Open a jar	A	1.40	0.62	0.69
	B	1.47	0.68	
Pain	A	1.23	0.50	0.15
	B	1.43	0.56	
Recreational activities	A	1.30	0.53	0.03
	B	1.60	0.56	
Sleeping	A	1.23	0.50	0.00
	B	2.10	0.40	
Social activities	A	1.07	0.25	0.39
	B	1.13	0.34	
Spending your usual amount of time doing your work	A	1.56	0.62	0.00
	B	2.63	0.55	
Tingling	A	1.03	0.18	N/A
	B	1.03	0.18	
Using your usual technique for your work?	A	1.57	0.62	0.00
	B	2.03	0.66	
Wash your back	A	1.60	0.72	0.00
	B	2.60	0.62	
Work or other regular activities	A	2.03	1.12	0.01
	B	2.63	0.61	

Yang JL, et al.²⁴ conducted a study in patients of adhesive capsulitis to study the effectiveness of end range mobilization/scapular mobilization treatment approach in adhesive capsulitis patients. But in this study grade 1&2 mobilization were along with distraction to improve pain and muscle guarding in stage 1 adhesive capsulitis. The results of study claimed that the grade 1&2 keltonborne mobilizations were more effective than a without keltonborne grade 1&2 mobilization.

In this study all variable on Quick DASH questionnaire showed significant improvement in the study, but some variable of Quick DASH questionnaire were not significantly different, e.g. cutting food, social activities and tingling sensation in arm. This is because these variables were not associated with stage 1 adhesive capsulitis in most of the patients. Cutting food mostly

didn't had the role of shoulder included in performing the activity and might be only females are involved in cutting food that's why it wouldn't have shown the significant difference after treatment. Social activities showed a very minor change, which is not significant that might be because of female included in our sample aren't much social. Tingling sensations also didn't showed significant difference as the treatment strategy we used was for treating pain and range of motion and might be because very few samples had the complain of tingling.

When comparing the post values for both the groups A and B it can be clearly observed that the mean values for the group A are less as compared to group B which showed that Keltenborn mobilization along with electrotherapy is more effective than electrotherapy only for treatment of stage I adhesive capsulitis. A few of variables have non-significant p values such as cutting food, opening jar, pain, social activities and tingling. In cutting food as only females candidate are involved and in social activities mostly females have less contribution, that might be a possible reason for non-significant p-value but the mean value for both the variables are less in group A as compared to group B which still explains the effectiveness of keltenborn mobilization. For tingling the mean values for both groups are same and the p-value is also non significant as there were only few samples with the complaint of tingling and tingling is mostly associated with radiating pain and that should be excluded from sample to specify the effectiveness of treatment only for adhesive capsulitis.

The post group comparison showed mark improvement in group A in which grade 1& 2 mobilization was performed along with TENS, hot packs and home exercises plan.

The pain levels immediately after treatment were not assessed objectively in either group; however, nine of the group A patients and eight of the group B stated that their shoulder felt better after treatment.

Vermeulen H M²⁵ stated a multiple subject case report and warranted the effectiveness of end range mobilization techniques in treatment of adhesive capsulitis. Indexes of pain, joint ROM and function were measured, before treatment and after three weeks of treatment. Significant increase in active ROM and shoulder function was noted. 57% patients rated their improvement in shoulder function as excellent, 29% patients rated as good and 14% patients rated as moderate.^{26,27} In this it was also found that in both groups the patients who were not performing exercise at home suggested by therapist their symptom were not improved significantly.

A study was conducted to determine the effectiveness of passive exercises coupled with therapeutic activities to

improve functional hand-to-back activity in adhesive capsulitis. This study supports passive exercise program along with therapeutic activities as a means for the improvement of functional hand-to-back activity in adhesive capsulitis.²⁸

Sean M Griggs²⁹ performed a prospective study on subjects having idiopathic adhesive capsulitis. This study provided detailed information about level of pain, Active-ROM and Passive-ROM and functional outcome. This study concluded that mobilization when applied on patients of adhesive capsulitis improves the patient's conditions. All the parameters were found to be significantly improved and 90% patients were satisfied.²⁹

Conclusion & Recommendation

The results of the study concluded that Hot pack, TENS and home exercises with or without keltonborne grade 1&2 are both effective for management of symptoms of stage 1 adhesive capsulitis. But Hotpack, TENS and home exercise plan with keltonborne mobilization grade 1&2 significantly improve in term of treatment duration and symptoms reduction. It was also noticed that home exercises plan was very crucial for reduction or maintenance of symptom at achieved level.

The sample size of study was very small so it is recommended that sample size should be large enough to generalizability of results. It is also recommended that further research should be done while considering the home exercises plane because these can affect the results of the study. Because in this study mostly did not follow the home exercises plan properly/regularly.

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ORIGINAL ARTICLE

FREQUENCY OF POST-STROKE FATIGUE AND ITS ASSOCIATION WITH QUALITY OF LIFE IN PAKISTANI POPULATION: A CROSS SECTIONAL STUDY

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Hina Tariq¹: Design & conception, analysis & interpretation of data, Writing: Revised and Accountable for all aspects
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Abstract

Background: Stroke after fatigue is a frequently occurring and debilitating consequence of stroke often neglected by the clinicians during the process of rehabilitation and recovery. **Objective:** The main objective of the study was to determine the frequency of fatigue after stroke and its impact on health related quality of life. It was hypothesized that fatigue is strongly to health related quality of life. **Materials and Methods:** A cross sectional study, which recruited 105 stroke patients through convenient sampling after the inclusion criteria, was met, out of which, 58 were males and 47 were females. The data was collected at two physiotherapy centers of Rawalpindi and Islamabad through a demographic questionnaire, Fatigue Assessment Scale (FAS), and Baseline Euro Quality of life scale (EQ-5D). The data analysis was conducted using SPSS version 21. **Results:** Around 82% of the total study participants exhibited moderate to severe post stroke fatigue with a higher prevalence in females (97.8%). Both physical and mental aspects of PSF demonstrated a significant negative linear relationship with health related quality of life ($p < 0.05$). Nearly all categorical predictors of health related quality of life (mobility, self-care, usual activities, pain, and anxiety-depression) demonstrated a significant relationship with PSF except for pain showed insignificant association with mental fatigue. **Conclusion:** Fatigue was found to affect most stroke survivors in acute and demonstrated an inversely proportional relationship with quality of life. A higher score on fatigue scale had a negative correlation with all the predictors of health related quality of life including mobility, pain, self-care, performance of daily life activities.

Keywords: Post-stroke fatigue, stroke, quality of life, frequency

INTRODUCTION

According to WHO, cerebrovascular accident (CVA) more commonly known as stroke is a disorder clinically characterized by central or focal disruption of cerebral function which lasts for more than 24 hours with no obvious cause other than that of vascular origin.¹ Stroke falls amongst the worldwide leading causes of morbidity and mortality.² In Pakistan, the incidence of stroke is 250 per 100,000 and 350,000 people suffer from stroke annually.³ Occurrence of stroke is usually followed by chronic and persistent health problems which require special attention as they possess a long recovery process and comprehensive rehabilitation. Stroke is usually associated with a variety of key neurological impairments along with other complications, which show a strong association and influence the recovery and rehabilitation of the patient. These include: depression, anxiety, fatigue, apathy, insomnia and other sleep disturbances.⁴

Research shows that fatigue is a common debilitating symptom which occurs after several neurological disorders like post-polio syndrome, Multiple sclerosis, traumatic brain injury, Parkinson's disease and cerebrovascular accident.⁵

Generally fatigue is defined as a state of tiredness, lack of energy and inability to execute effort for a particular task.⁶ Fatigue can be either physiological or pathological; physiological fatigue also known as subjective fatigue is a

state of weariness, which occurs normally following overexertion and ameliorated following a rest period. On the other hand, pathological or objective fatigue refers to continuous tiredness not related to prior activity level and does not improve following rest.⁷ The experience of pathological fatigue has been described by the stroke patients different than that of the fatigue they experienced normally before the occurrence of stroke and that the fatigue they underwent following stroke is a direct consequence of CVA itself.¹⁴ Post-stroke Fatigue (PSF) can be further categorized into physical and mental fatigue; the muscle tiredness which results in the disruption of the performance of physical activity is referred to as physical fatigue(8). On the other hand, mental fatigue refers to lack of ability to concentrate and tolerate mental exertion for longer durations.⁸

Fatigue is one of the incapacitating symptoms experienced post stroke; the reported prevalence of PSF in the literature ranges from around 32% to 82%.^{5,9,10,11} PSF can adversely affect physical and psychological functioning and reduced functional independence which leads to poor health-related quality of life (HRQoL)^{5,12} and consequently have negative implications in terms of rehabilitation and the patient's family, social and occupational life.⁵

Van de Port et al conducted a longitudinal study which showed that PSF is significantly associated with reduced Instrumental activities of Daily Living (IADLS) and HRQoL.¹³ Another study which explored the effect on activities of daily living (ADLs) reported that PSF is significantly

correlated with dependence in carrying out primary and secondary ADLs as well as higher mortality rates. Moreover, it was identified that the physical aspects of quality of life were most severely affected by PSF.¹⁴ Bendz et al also explored the impact of fatigue and concluded that fatigue influenced the rehabilitation process and recovery negatively.⁴ Mental aspect of PSF was found to be the most commonly occurring symptom after stroke which served as a barrier in the rehabilitation of the patients and showed a negative influence on the functional independence of patients.¹⁵ Roding et al. conducted a qualitative study to document the fatigue experiences of young stroke survivors; the findings of the study concluded that fatigue had been the most debilitating and incapacitating aspect after stroke effecting their lives and independence.¹⁶ The evidence in the literature suggests that PSF has received relatively little attention by the clinicians in rehabilitation and interventional studies targeting fatigue and its potential exacerbating symptoms are required to help reduce its negative impact on HRQoL, rehabilitation process and recovery of the patients.

MATERIAL & METHODS

A cross sectional study was conducted to evaluate the impact of post-stroke fatigue on quality of life months from January 2016 to July 2016 at two physiotherapy centers of Rawalpindi and Islamabad (Pakistan Railway Hospital Rawalpindi and Neurocounsel, Islamabad). Approval from ethical committee of Neurocounsel Islamabad and Railway Hospital Rawalpindi was obtained and all participants involved in the study gave written informed and signed consent. Fig. 1 provides a flow chart for different stages through the study. The study participants were recruited in the study through convenient sampling. After the inclusion criteria was met, and informed consent was taken, 110 stroke survivors were included in the study. The sample included all cases of any pathological subtype of stroke; both males and females; individuals with post-stroke duration of at least one month and aged more than 18 years with no upper age limit. The study excluded: cognitively impaired patients who were unable to understand basic instructions (2-step command); unable to understand English, Urdu or Punjabi language; individuals with any medical instability which can alter the perception of fatigue and co-morbidities which can also act as a confounding factor for PSF (e.g. cardiovascular involvement).

Data was collected through Fatigue assessment scale (FAS) and Euro Quality of Life Scale (EQ-5D). The FAS is a 10-item scale with 10 statements about two different aspects of

fatigue (mental and physical). It is a valid and reliable tool in stroke population with a minimum score of 10 and a maximum score of 50. A higher score indicates greater fatigue. FAS has been described by Mead et al to possess best test-retest reliability in stroke individuals (17). EQ-5D comprises of two parts, one categorical domain, and a visual numerical scale. The categorical scale consists of five separate domains, which includes mobility, self-care, usual activities, pain/discomfort, and anxiety/depression on an ordinal scale of 3 levels of perceived problems. Level 1 indicates no problem, level 2 some problem while level 3 denotes severe problem perceived by the patient. The second part of this tool incorporates a visual analogue scale (VAS) in which a score of 100 is indicative of the best health possible while zero is indicative of worst health. This scale is reported to have concurrent and discriminant validity to measure HRQoL in stroke population(18). The descriptive and inferential data analysis was conducted by utilizing SPSS version 21.

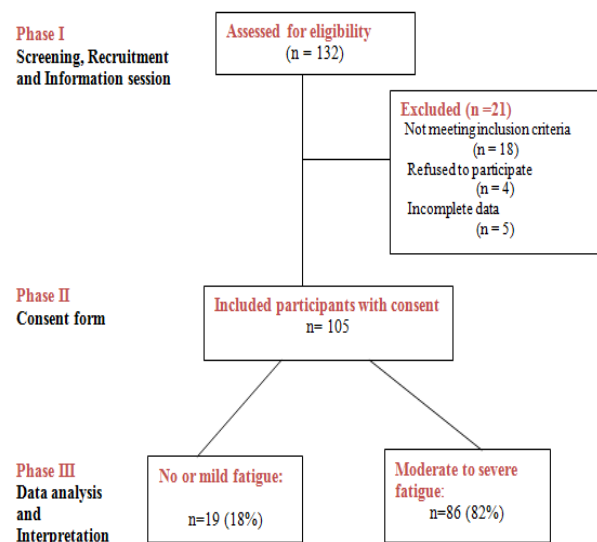


Fig. 1 Study flow diagram

RESULTS

Out of 110 participants, 5 failed to provide complete data (92% response rate) and a final of 105 individuals were included in the descriptive and inferential statistical analyses. Table 1 demonstrates demographic and clinical characteristics of the study participants. There were a total of 105 respondents out of which 58 (55.2%) were males and 47 (48.6%) were females. The age of the participants ranged from 22-76 years and the mean age was found to be 52 years \pm 5.88.

Table 1 Study characteristics

Characteristic	Range	Mean	(SD)
Age	22-76	52	14.01
Mental fatigue on FAS	5-25	16	5.88
Physical fatigue on FAS	5-25	15.85	5.33
Total fatigue on FAS	10-47	31.98	10.30
Quality of life on EQ-VAS	25-65	43	9.81

Table 2 shows the percentage of participants according to severity of fatigue. Fatigue Assessment scale (FAS) measured two domains of fatigue: mental and physical with a total score of 50 and a score of 25 for each respectively. Out of 25, a score of 5 denoted no fatigue; scores which ranged from 6-10 indicated mild fatigue; scores which fell in the range of 11-17 meant moderate fatigue and finally severe fatigue scores above 18 were interpreted as severe fatigue. Of the total study participants, 79% exhibited moderate to severe mental fatigue, 77% demonstrated moderate to severe physical fatigue while overall 82% showed moderate to severe total fatigue on FAS.

Table 2: Study participants according to severity of fatigue

Fatigue on FAS	No fatigue	Mild	Moderate	Severe
Mental fatigue	5.7%	15.2%	33.3%	45.7%
Physical Fatigue	1.9%	21%	27.6%	49.5%
Total Fatigue	1.9%	15.2%	34.3%	48.6%

Percentage of stroke survivors demonstrating problems in different domains of HRQoL are summarized in Fig.2. The mobility domain demonstrated that 81.9% of the total study participants had some kind of problem in walking about, 2.9% faced no problem in walking about while 15.2% were confined to bed. Regarding self-care, 9.5% participants faced no problems, 43.8% had some problems in washing and dressing themselves, and the remaining 46.7% were unable to wash or dress on their own. On the domain of usual activities (e.g. work, study, family, housework etc.), 8.6% of the stroke survivors faced no problems in performing their usual daily activities, 47.6% experienced some problems while 43.8% were unable to

perform their usual activities at all. The results on the pain scale of EQ-5D revealed that 39% of the participants had no pain or discomfort, 48.6% faced moderate pain or discomfort, and 12.4% experienced severe pain or discomfort. On anxiety-depression scale 25.7% of the stroke individuals found to have no anxiety or depression, 62.9% experienced moderate anxiety or depression while the remaining 11.4% felt extremely anxious or depressed. On visual analogue scale known as EQ-VAS, the score of the stroke survivors ranged from 25-65 with a mean of 43 ± 9.81 .

The correlation between PSF(mental and physical) and HRQoL on the numerical scale was found out through Pearson's correlation test. The results demonstrated that there is a significant linear relationship between PSF and HRQoL (95% CI; $r = -0.49$, $r = -0.45$; $P = 0.00$). The association of mental and physical fatigue post stroke with categorical domains of EQ-5D: mobility, self-care, usual activities, pain and anxiety-depression was analyzed through Pearson's Chi square test. All the domains showed significant association with physical and fatigue (95% CI; $P = 0.00$) except for pain with an insignificant association with mental fatigue (95% CI; $P = 0.12$) i.e. pain was independent of mental fatigue after stroke.

DISCUSSION

The impact on PSF has been reported in the literature with decreased functional independence, poor rehabilitation outcomes, and consequently a greater mortality rate. These are particularly related with reduced health-related quality of life in long term. This study found an association of PSF with nearly all the components of HRQoL measured by EQ-5D including components of functional independence (mobility, self-care, usual activities). This confirmed our hypothesis that PSF has a linear relationship with quality of life. Glader et al conducted a study in Sweden to investigate different variables associated with PSF; the results revealed that PSF was significantly associated with higher degree of dependence in exhibiting activities of daily living.¹⁴ However, these restrictions might be a consequence of other commonly occurring complications after stroke like balance problems and physical deconditioning and might not be direct result of PSF; therefore, more studies are needed to probe and produce stronger conclusions. Pain was the only component of HRQoL which did not reveal a significant relationship with mental aspect of PSF in the current study; nonetheless the physical aspect of PSF showed a significant association. Pain is a common debilitating symptom after stroke and is frequently reported to be a hindrance in recovery of the patient and mediate long

term quality of life.¹⁹ Apperlos conducted a study on the prevalence and predictors of pain and fatigue post stroke and reported no significant relationship between PSF and painful symptoms.²⁰ On the other hand, Naess et al demonstrated that the stroke survivors who experienced painful symptoms exhibited greater fatigue scores on Fatigue Severity Scale.²¹

The strength of the present study was a good response rate (92%) from the participants while the limitation is the

design of the study i.e cross sectional which is unable to make conclusions about the temporal and causal relationship of fatigue with quality of life after stroke. Further studies with longitudinal designs are required to make robust conclusions about the associations of PSF.

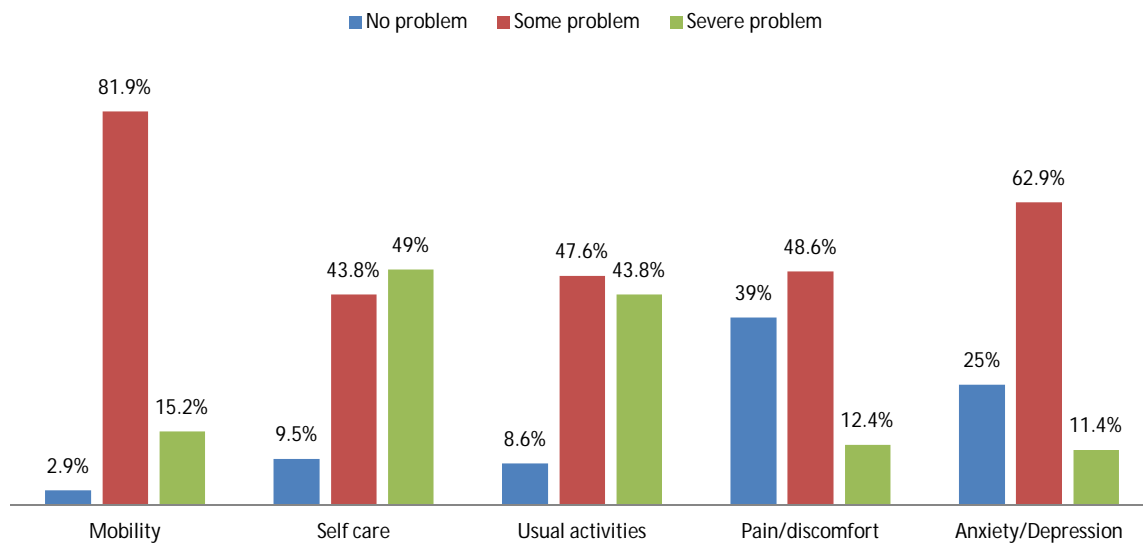


Figure 2: Percentage of stroke survivors demonstrating problems in different domains of HR-QoL

Conclusion

Fatigue was found to affect most stroke survivors in acute stage and demonstrated an inversely proportional relationship with quality of life. A higher score on fatigue scale had a negative correlation on all the predictors of health related quality of life including mobility, pain, self-care, performance of daily life activities.

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ORIGINAL ARTICLE

URINARY INCONTINENCE AMONG WOMEN AFTER MULTIPLE PREGNANCIES

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Muhammad Osama²: Statistical analysis & interpretation of data, Manuscript writing: revised and accountable for all aspects
Faisal Ali³: Design & Conception, Data collection and Writing: Revised and Accountable for all aspects
Abdul Hasseb Bhutta¹: Design & Conception, Data Collection, Data Entry, Revised and Accountable for all aspects

Abstract

Objective: The purpose of the current study was to look into the occurrence of symptoms of Stress and Urge Urinary Incontinence among women following multiple pregnancies, and the association of gravidity and age with severity of urinary incontinence. **Study Design:** Cross Sectional Survey. **Study Setting:** Al-Nafees Hospital, Islamabad. **Methodology:** Women aged 20-40 years of age with multiple pregnancies were included in the study, whereas females with urinary incontinence with cause other than pregnancy or delivery were excluded. Non probability convenience sampling was used. "MESA Urinary Incontinence Questionnaire" was used as an outcome measurement tool. **Results:** A total of 129 participants were included in the study. The mean age of participants was 30.68±5.03 years. Gravidity was 2 for 37.2% (n=48) participants and >2 for 62.8% (n=81) participants. Among participants 55.8% (n=72) women had vaginal and 44.2% (n=57) had caesarian deliveries. A non significant positive correlation was found between gravida and stress incontinence ($p>0.05$), however a positive significant correlation was observed between gravida and urge incontinence ($p=0.05$). Similarly a non significant correlation was found between age and stress incontinence ($p>0.05$), however a positive significant correlation was observed between age and urge incontinence ($p<0.05$). No significant differences were observed based on mode of delivery in terms of stress incontinence and urge incontinence ($p<0.05$). **Conclusion:** Urinary Incontinence is common among women postpartum and urge incontinence is associated with age and gravidity. Mode of delivery has no significant difference in terms of severity of urinary incontinence.

Keywords: Urinary incontinence, stress incontinence, urge incontinence, postpartum, gravida, vaginal delivery, caesarian section.

INTRODUCTION

Urinary Incontinence (UI) is defined as the uncontrolled or spontaneous spillage of urine, and is of two major types; namely Stress Urinary Incontinence (SUI) and Urge Incontinence (UI).¹ Urinary incontinence can also be caused by hyperactivity of detrusor muscle or it may be idiopathic as well. Pregnancy followed by vaginal delivery is associated with pelvic floor dysfunction secondary to mechanical insult to urethral sphincter or injury of nerve supply of the pelvic floor muscles.^{2,3} The prevalence of Urinary Incontinence (UI) among women following pregnancy ranges from 3-40%.⁴⁻⁵ Urinary incontinence is supposed to be common by many women and is not reported, however 6% of women always require protection against incontinence and can be managed.⁷ The occurrence of urinary incontinence among women may differ based on the country of origin, gravida, mode of delivery and positive history of incontinence.⁸ The purpose of the current study was to look into the occurrence of

symptoms of Stress and Urge Urinary Incontinence among women following multiple pregnancies, and the association of gravidity and age with severity of urinary incontinence.

MATERIAL & METHODS:

A cross sectional survey was conducted at Al-Nafees Hospital, Islamabad. A sample size of 138 participants was calculated using "Raosoft" sample size calculator keeping margin of error 5%, confidence interval 95% and a response distribution of 90%. Women aged 20-40 years of age with multiple pregnancies were included in the study, whereas females with urinary incontinence with cause other than pregnancy or delivery were excluded. Non probability convenience sampling was used. The duration of study was 6 months. "MESA Urinary Incontinence Questionnaire" was used as an outcome measurement tool. Data analysis was done using SPSS 16.0.

RESULTS

The response rate was 93.47% and 129 participants were included in the study. The mean age of participants was 30.68 ± 5.03 years. Gravidity was 2 for 37.2% (n=48) participants and >2 for 62.8% (n=81) participants (Fig 1). Only 8.5% (n=11) participants were working women, and 23.3% (n=30) women were from low, 62.0% (n=80) from middle and 14.7% (n=19) from high income families. Regarding mode of delivery 55.8% (n=72) women had vaginal and 44.2% (n=57) had caesarian deliveries. The prevalence of stress and urge incontinence within one year postpartum was 96.1% and 76.7% respectively. The mean stress incontinence score of the participants was 13.53 ± 6.44 and the mean urge incontinence score was 6.26 ± 4.65 , and the details of the distribution of symptoms are shown in Table 1. A non significant positive correlation was found between gravida and stress incontinence ($r=0.124$, $p=0.163$), however a positive significant correlation was observed between gravida and urge incontinence ($r=0.287$, $p=0.001$). Similarly a non significant correlation was found between age and stress incontinence ($r=0.038$, $p=0.67$), however a positive significant correlation was observed between age and urge incontinence ($r=0.243$, $p=0.006$). The mean score of stress and urge incontinence was 13.76 ± 6.23 and 7.33 ± 4.96 respectively for women having vaginal delivery and 13.23 ± 6.34 and 5.32 ± 3.97 respectively for women having caesarian delivery. However no significant differences were observed between women having vaginal delivery or caesarian delivery in terms of stress incontinence ($p=0.659$) and urge incontinence ($p=0.080$) (Table 2).

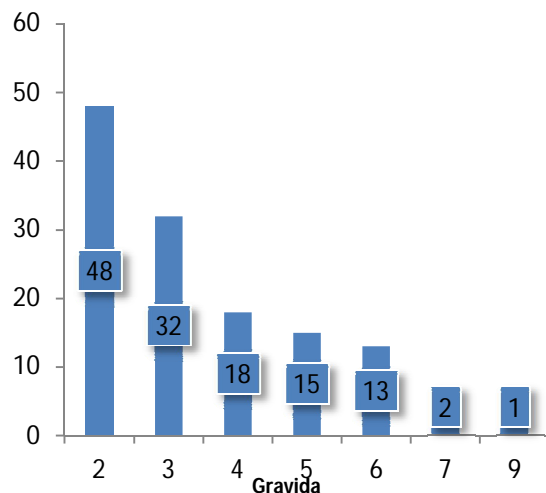


Figure 1: Percentage distribution of participants on basis of Gravida

Table 1: Percentage distribution of symptoms of urinary Incontinence among participants

	Never (%)	Rarely (%)	Sometimes (%)	Often (%)
Stress Incontinence				
Does coughing gently cause you to lose urine?	9.3	19.4	48.8	22.5
Does coughing hard cause you to lose urine?	3.9	17.1	50.4	28.7
Does sneezing cause you to lose urine?	10.9	17.8	49.6	21.7
Does lifting cause you to lose urine?	21.7	16.3	43.4	18.6
Does bending cause you to lose urine?	22.5	15.5	47.3	14.7
Does laughing cause you to lose urine?	27.1	19.4	38.8	14.7
Does walking briskly/jogging cause you to lose urine?	35.7	27.1	24.8	12.4
Does straining when constipated cause you to lose urine?	35.7	23.3	29.5	11.6
Does getting up from a sitting to a standing position cause you to lose urine?	38.8	34.1	18.6	8.5
Some people receive very little warning and suddenly find that they are losing, or about to lose, urine beyond their control. How often does this happen to you?	30.2	35.7	21.7	12.4
Urge Incontinence				
If you can't find a toilet or find a toilet that is occupied and you have an urge to urinate, how often do you end up losing urine and wetting yourself?	23.3	42.6	27.1	7.0
Do you lose urine when you suddenly have the feeling that your bladder is very full?	24.0	35.7	29.5	10.9
Does washing your hands cause you to lose urine?	51.9	31.0	13.2	3.9
Does cold weather cause you to lose urine?	41.9	18.6	27.1	12.4
Do drinking cold beverages cause you to lose urine?	41.9	24.0	22.5	11.6

Table 2: Difference in Stress & Urge incontinence among participants based on Mode of Delivery

Mode of Delivery	Stress Incontinence (Mean \pm SD)	P-Value	Urge Incontinence (Mean \pm SD)	P-Value
Vaginal delivery	13.76 \pm 6.23	0.659*	7.33 \pm 4.96	0.080*
Caesarian delivery	23 \pm 6.34		5.32 \pm 3.97	

*Independent T-test, showing no significant difference.

DISCUSSION

The purpose of the current study was to look into the occurrence of symptoms of Stress and Urge Urinary Incontinence among women following multiple pregnancies, and the association of gravidity and age with severity of urinary incontinence. The results of the current study show no significant difference in the severity of Stress and Urge Urinary Incontinence among women based on mode of delivery, similar to the results of a study conducted by Jolley JV stating incontinence not to be related with the mode of delivery⁷, however a study conducted by F Torkestani shows significant relationship between urinary incontinence and delivery mode, stating caesarean section may decrease the rate of stress incontinence.⁹ A study conducted by Rortveit G et al on 15,307 women showed urinary incontinence to be more prevalent in women having vaginal deliveries as compared to the caesarean section group. The study stated the prevalence of urinary incontinence to be 10.1% in nulliparous women, 15.9% in women having delivery via caesarean section and 21% in women having vaginal delivery, yet the author does not recommend an increase in the use of caesarean section. Rortveit G et al also stated stress urinary incontinence and mixed urinary incontinence to be significantly associated with caesarean sections.¹⁰

The current study shows a positive correlation between age with severity of urge incontinence but not for stress incontinence which is in accordance with a study conducted by in Tehran on 125 women which states urinary incontinence and age to be associated with each other.⁹ The current study also shows a positive correlation between gravidity with severity of urge incontinence but not for stress incontinence which is in accordance with the same study showing a significant relationship between urinary incontinence and gravidity.⁹ A study conducted on 833 women showed the prevalence of urinary incontinence to be lower among nulliparous and postmenopausal women as compared to parous and premenopausal women. Incontinence is also found to be associated with perineal surgery.⁷ Literature suggests that urinary incontinence is prevalent among women

postpartum, and strengthening of the pelvic floor muscle is an effective means of reducing the incidence and severity of urinary incontinence 3 months postpartum.¹¹

Conclusion

Urinary Incontinence is common among women postpartum and urge incontinence is associated with age and gravidity. Mode of delivery has no significant difference in terms of severity of urinary incontinence.

Limitations

The limitations of the study include a small sample size and no objective measurement of severity of urinary incontinence.

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