The Jacket Test for Assessing People with Chronic Stroke

Purpose: (1) To examine the intra-rater, inter-rater and test-retest reliability of Jacket Test (JT) times with 28 people with chronic stroke. (2) To determine the correlation of JT time with stroke-specific impairments. (3) To construct the optimal cut-off time for the JT that best discriminating 28 people with stroke from 30 healthy older adults.

Methods: The Jacket Test completion times were measured along with Fugl-Meyer Upper Extremity Assessment (FMA-UE), hand grip strength, 5-times Sit-to-stand (FTSTS) test, Berg Balance Scale (BBS) and timed “up and go” (TUG) test, and Community Integration Measure(CIM) using cross-sectional design.

Results: The Jacket Test completion times showed excellent intra-rater, inter-rater and test-retest reliability (ICC = 0.781-1.000). The unaffected-side JT times were significantly correlated with FMA-UE score, affected hand grip strength, BBS score, TUG times and CIM score. The affected-side JT times significantly correlated with affected hand grip strength. The cut-off time of 18.33s in affected side and 18.38s for unaffected side (sensitivity 96.7%; specificity 85.7%-96.4%) was used to best discriminate the subjects with stroke and healthy older adults.

Conclusion: The Jacket Test is a reliable and valid measure tool in clinic to evaluate the upper extremity function in people with chronic stroke.

Introduction

Stroke is the second most frequent cause of death and the leading cause of disability worldwide after cardiovascular disease [1]. A World Health Report (2004) reveals that stroke causes approximately 5.5 million deaths annually with the loss of 44 million disability-adjusted life-years [2]. The incidence of stroke doubles with each decade of life after the age of 55 [3].

Up to 70% of people with chronic stroke need physical or occupational therapy in the initial phrase of rehabilitation due to paresis in their upper and/or lower limbs [4]. More than 60% of people with stroke fail to regain full upper limb function within 6 months post-stroke [5]. Upper extremity dysfunction is of course a major barrier to return to normal daily activity [6]. Efficient use of the upper limbs for reaching and grasping is required in more than half of the activities of daily living (ADL) [7], including dressing, cooking and eating. Compared with the lower limbs, upper extremity function is more essential for resuming independent living and regaining self-esteem [8, 9].

The Physical Performance Test (PPT) was originally developed to assess multiple domains of physical function in the elderly [10]. The scale has 9 items which cover many daily living activities: writing a sentence, simulated eating, lifting a book and putting it on a shelf, putting on and removing a jacket, picking up a coin from the floor, turning 360 degrees, a 50-foot walk test, climbing one flight of stairs and climbing four flights of stairs. Rozzini and colleagues suggested that PPT results are independently associated with some chronic diseases in elderly people (with regression coefficients ranging from -2.34 to -9.00) [11], including stroke, cardiac disease and Parkinsonism. Brown and colleagues suggested defining scores of 32–36 as not frail, 25–31as mild frailty and 17–24 as moderate frailty. A score less than 17 is taken to indicate that an individual is unlikely to function well in the community [12].

Putting on and removing a long-sleeved jacket is one of the items in the PPT. The subject is required to don jacket or a cardigan sweater such that it is straight on his or her shoulders, and then remove it completely [10]. The time for completing the task is recorded. This Jacket Test can be used to evaluate the functional mobility of the upper limbs, as the test involves abduction of the shoulder joint, flexion and extension of the elbow joint and gripping with the hands.

The Jacket Test has great potential in assessing the proficiency of upper limb use in daily activities for people with chronic stroke. Compared with other existing upper extremity measurement scales, the Jacket Test consists of functional movement of daily living which only takes less than a minute to complete. However, no published study has yet assessed the test's reliability and validity with stroke survivors. The objectives of this study were to examine the test's intra-rater, inter-rater and test-retest reliability and any correlation of Jacket Test times with the results of other stroke-specific impairment assessments including the Fugl-Meyer upper extremities assessment (FMA-UE), grip strength, the 5-times sit-to-stand (FTSTS) test, the Berg Balance Scale (BBS), the timed "up and go" (TUG) test and the Community Integration Measure (CIM). Another objective was to determine an optimal cut-off time for the Jacket Test that best discriminates people with stroke from healthy older adults and to quantify the minimal detectable change (MDC) for the completion time among stroke survivors.

Methods

Subjects

A previous study has demonstrated an Intra-class Correlation Coefficient (ICC) value of 0.90 for the PPT performance in assessing the elderly people with mobility impairment [13]. A sample of 27 subjects with 2 observations per subject can therefore achieve 80% power to detect an ICC value of 0.9 under alternative hypothesis for test-retest reliability at a significance level of 0.05.

This study was cross-sectional in design. Twenty-eight subjects with chronic stroke were recruited from a local self-help group for stroke survivors. Subjects with stroke were included if they (1) were aged between 50 and 85 years, (2) had suffered a stroke at least 1 year previously; (3) had an Abbreviated Mental Test score ≥7; (4) had volitional control of the non-paretic arm, and at least minimal anti-gravity movement in the shoulder of the paretic arm and wrist; and (5) were in a stable medical condition that allowed them to complete the test protocol successfully.

Candidate subjects were excluded if they (1) were unable to use an upper limb because of musculoskeletal problems (usually arthritis or frozen shoulder); (2) had an acute or terminal illness; (3) had a cognitive disorder caused by severe disorders of the central nervous system (usually Parkinson's disease or Alzheimer's disease); or (4) had any additional medical, cardiovascular or orthopedic condition, which would hinder proper assessment.

Thirty healthy older adults who met the criteria were recruited from local community centers. Healthy controls were included if they (1) were aged 50 or older; (2) were able to complete the Jacket Test; (3) were able to understand and comply with verbal commands; (4) were not concurrently involved in any drug study or other clinical trial; and (5) did not have any additional medical, cardiovascular or orthopedic condition, which would hinder proper assessment.

The ethics committee of the Hong Kong Polytechnic University approved the study protocols as meeting all of the guidelines set by the Declaration of Helsinki.

The objectives of the study were clearly explained to all of the subjects, and all gave written informed consent prior to the testing.

Procedure

The structure of data collection and analysis are shown in fig 1. The subjects with stroke were assessed twice one week apart (Day 1 and Day 2). The Jacket Test would be assessed on Day1 and Day 2. The FMA-UE, FTSTS test, BBS, TUG test and CIM were administered and their maximum hand grip strength was assessed on Day 1. The order of the test was randomized by drawing lots. At least 2 minutes of rest was allowed after each test in order to minimize any effect of fatigue. The healthy controls took only the Jacket Test on Day 1.

Outcome measurements

The Jacket Test

On the command “Go”, the subject was required to put on completely a long-sleeved lab coat so that it was straight on his or her shoulders and then to remove it completely [11]. In our study, the time from the command to when the garment had been completely removed in the standing stance was recorded using a stopwatch. Buttoning or zipping up the jacket is not required in our study.

The test was completed thrice in each session. The time of affected-side Jacket Test time was from inserting the affected arm first to finishing the rest part. The time of unaffected-side and affected-side Jacket Test time was from inserting the unaffected arm and affected arm first to finishing the rest part, respectively. The time of dominant-side and non-dominant Jacket Test time was from inserting the dominant arm and non-dominant arm first to finishing the rest part, respectively.

Fugl-Meyer Upper Extremity Assessment

The FMA-UE is a comprehensive, quantitative measure of motor function in terms of isolated movement and synergy. It tests volitional movement, reflex activity and coordination. It has excellent test-retest reliability (ICC≥0.98) in subjects with chronic stroke[14]. The FMA-UE consists of 33 items, and each item is scored on a 0–2 scale, giving a maximum possible score of 66. Higher scores indicate less motor impairment.

Hand grip strength

Griping movement is required in completing the Jacket Test as it helps to grip the jacket tightly and insert the arm straight into the long sleeve of the jacket. Grip strength [15] was measured using a Jamar dynamometer (Sammons Preston Rolyan, Bolingbrook, IL, USA) with the standardized positioning and instructions recommended by the American Society of Hand Therapists. Excellent test-retest reliability (ICC=0.80–0.89) has been reported in people with chronic stroke [16]. The subjects were seated with their shoulders adducted and neutrally rotated, the elbow flexed at 90°, the forearm in a neutral position and the wrist in 0 to 30° of flexion and between 0 and 15° of ulnar deviation. In that position the testees were instructed to squeeze the dynamometer as hard as possible for 5 seconds with the standardized verbal reinforcement of 'Harder! ... Harder! ... Relax'. The subjects were asked to firstly complete three trails with the unaffected hand and then completed three trails with affected hand. Between each trial, 2 minutes' rest interval was provided. The means of the three trials of unaffected and affected hand were used in the data analysis.

Five-times sit-to-stand test

The standing balance ability is one of the essential conditions for the Jacket Test performed successfully, as subject needs to put on and off the jacket in standing position. The FTSTS test measures lower extremity muscle strength and standing balance in the transition from sitting to standing and back [17]. Excellent reliability (ICC≥0.97) has been reported among subjects with chronic stroke [17]. At the beginning the subject sat with his/her back against the back of a chair with a seat height 45cm. The subject was then asked to stand up and sit down 5 times as quickly as possible. The time from the command “Go” to the subject’s reaching the standing position on the 5th repetition was recorded using a stopwatch.

Berg’s Balance Scale

The BBS [18] is designed to quantify functional balance, as balance is an essential condition for performing upper limb function in standing position. Excellent reliability [ICC=0.95] had been demonstrated in subjects with chronic stroke [19]. The BBS consists of 14 items, and each item scored on a 0–4 scale, giving a maximum possible score of 56. Higher scores indicate less motor impairment.

Timed “up and go” test

The TUG test [20] assesses functional mobility. It has demonstrated excellent test-retest reliability (ICC=0.95) in assessing stroke survivors [21]. Initially, the subject sat on the chair with a seat height of 46cm. The subject was then required to stand up, walk 3 meters, turn back, walk to the chair, turn again and sit down. The time from “Go” command to the subject’s sitting down again was recorded using a stopwatch.

Community Integration Measure

The Jacket Test is an ADL task in itself. The Chinese version of the Community Integration Measures (CIM) was used to assess each subject's level of community integration, including general assimilation, support, occupation and independent living. The Chinese version of CIM has 10 items with each item rating on a five-point scale, giving a maximum score of 50 [22]. The performance of ADL is expected to affect the degree of CIM. The CIM has shown good internal consistency (Cronbach's α=0.84) and test-retest reliability (ICC=0.84) among people with chronic stroke [22]. The CIM has 10 items, each item rated on a scale from 1 to 5, giving a minimum score of 10 to a maximum of 50. Higher score indicate better community integration.

Statistical analysis

All the statistics were calculated using version 17 of the SPSS software suite (SPSS Inc, Chicago, IL, USA). Descriptive statistics were compiled describing the subjects' demographic characteristics. Model 3 ICCs (ICC3,1 and ICC3,2) were used to quantify the degree of intra-rater and inter-rater consistency, respectively. The subjects are considered as a random effect and rater is considered as a fixed effect. The test-retest reliability of the observations was estimated using ICC model 2 (ICC2,1), where both the raters and subjects were considered as random effects with a single rating [23]. An ICC<0.250 was considered as describing little or no correlation, ICC=0.250–0.500 was defined as fair, ICC=0.500–0.750 was termed moderate to good, and ICC=0.750–1.000 was regarded as good to excellent [23].

The Kolmogorov-Smirnov test was used to determine whether or not the data were normally distributed. Pearson correlation coefficients were calculated relating the Jacket Test times with the outcomes of the other tests (FMA-UE, grip strength, BBS, FTSTS, TUG, and CIM) when the data were normally distributed. Otherwise, Spearman correlation coefficients were used.

The significance of the differences in mean Jacket Test times of the healthy control and chronic stroke groups were assessed using independent t-tests. The differences within the stroke and healthy control groups were compared using paired t-tests.

The minimal detectable change in the Jacket Test completion time was calculated by using the test-retest reliability and standard deviation of the Jacket Test time in the following formula [23]:

$$\text{MDC} = 1.96 \times \text{SEM} \times \sqrt{2}$$

where

$$SEM = S_x \sqrt{1 - rxx}$$

and S_x is the standard deviation of the Jacket Test times and r_{xx} is the reliability coefficient. The 1.96 in the MDC equation is used to determine the 95% confidence interval(95%CI). The product of SEM multiplied by 1.96 is multiplied by the square root of 2 to account for errors associated with repeated measurement.

To discriminate the Jacket Test performance of subjects with stroke from that of the healthy controls, receiver operating characteristics (ROC) curves were constructed. The curve is a plot of "sensitivity" versus "specificity" for all the possible cut-off points which might distinguish the two groups [24]. The optimum cut-off times were sought using the Youden Index for the trade-off between sensitivity and specificity [25]. The area under an ROC curve (AUC) quantifies the accuracy of the Jacket Test in discriminating the healthy controls from subjects with chronic stroke based on their times. All the analyses were performed on the hypothesis that the AUC was 0.5 [23,26].

Results

Demographic data describing 28 subjects with chronic stroke (18 male and 10 female; mean age ± SD = 57.6 ± 5.1; mean post-stroke duration± SD=7.5 ± 4.8 years) and the

30 healthy controls (11 male and 19 female; mean age ± SD=61.8 ± 5.7 years) are shown in Table 1. Significant gender difference(p=0.036) can be found between the two groups. Table 2 presents the outcome of Jacket Test. Table 3 presents the within group comparisons and between group comparisons of Jacket Test. The mean values of all of the outcome measures are shown in Table 4.

The data in Table 5 show good to excellent intra-rater, inter-rater and test-rest reliability (ICC=0.781–1.000) of the Jacket Test times in the subjects with chronic stroke. The MDC (95% CI) in the Jacket Test times for affected and unaffected side were 12.64s and 24.79s, respectively.

Table 6 shows the correlations between the Jacket Test times and the other outcome measures. Significant correlations were found between unaffected-side JT times and FMA-UE results, affected-side grip strength, BBS, CIM scores (r=-0.386 to -0.750), and TUG times (r=0.556). The affected-side JT times also correlated with affected-side maximum hand grip strength (r=-0.615).

The optimal cut-off time (Fig. 2 and 3) was determined to be 18.33s (sensitivity 96.7%; specificity 85.7%; AUC=0.965; $p \leq 0.001$) when the affected arm is inserted first and 18.38s(sensitivity 96.7%; specificity 94.4%; AUC=0.995; $p \leq 0.001$) with the unaffected arm inserted first.

Discussion

This study has investigated the intra-rater, inter-rater and test-retest reliability of the Jacket Test among people with chronic stroke and to determine the cut-off time which best distinguishes those with stroke from the healthy older adults.

Reliability of the Jacket Test in stroke evaluation

Consistent with results of a previous study of the Physical Performance Test [13], the Jacket Test showed excellent reliability in this study. A previous study led by King [13] revealed the PPT's excellent inter-rater (ICC=0.96) and test-retest (ICC=0.88) reliability with the healthy elderly. Sufficient training provided to the assessors, clear instructions and standardized protocols might contribute to the high reliability observed here with stroke survivors. Between two adjacent trials, 2 minutes' rest was provided to minimize any fatigue effects. In stroke group, the interval of 1 week between sessions was apparently sufficient to minimize any learning effect [27,28].

Performance of the Jacket Test in stroke evaluation

Few researchers have been able to draw on any systematic research into the performance of the Jacket Test among stroke survivors. In this study, the mean completion times of the stroke group (affected: 28.6s; unaffected 125.1s) were significantly longer than those of the healthy controls (dominant:14.2s; non-dominant:13.6s). The MDC in Jacket Test times was 12.64s on the affected side and 24.79s on the unaffected side. The difference in mean Jacket Test times between the two groups was far greater than the MDC on both affected and unaffected sides. The different means apparently reflected real differences, not measuring error. This could be explained by the muscle weakness, poor coordination [29] and disorganized motor unit pool activation [30] after stroke, which seriously impair motor function in the upper limbs.

The Jacket Test completion times of the healthy controls observed in this study (mean: 13.6–14.2s) were slightly longer than those observed in Donnell's study [31] (mean: 12.90–13.43s). This might due to the differences in the gender proportions between the two studies. All of Donnell's subjects were males, while most of the subjects here (63.3%) were women. The performance of functional tasks and the muscle strength of older males has been demonstrated to be better than that of older females in previous studies [32,33]. The Jacket Test includes the coordinated movement of shoulder, elbow, wrist and even the lower limb muscle in order to accomplish the whole task. The known gender effect on muscle strength might influence the performance of the Jacket Test completion time.

Correlation between the Jacket Test times and other outcome measures

The FMA-UE is commonly used to assess volitional movement, reflex activity and coordination. The Jacket Test assessed proficiency in dressing, which involves combined movement of shoulder, elbow, wrist and hand, so it was reasonable to expect good to excellent correlation between the two tests. Grip strength on the affected side showed significant correlation with the Jacket Test times. A study led by has Soham demonstrated that, among older people, poorer maximum hand grip strength is an independent predictor of poorer ADL performance, such as dressing skill [28]. So the significant correlation is not unexpected.

No significant correlation could be found between FTSTS times and the Jacket Test times. The FTSTS test mainly measures functional lower extremity muscle strength and dynamic balance [17]. Although the Jacket Test required the subjects to complete the task while standing, it mainly focused on the coordination of upper limb movement.

Unaffected-side Jacket Test times were both significantly correlated with both BBS scores and TUG test times. The TUG test and the BBS are reliable measurement tools for assessing functional mobility and functional balance respectively. The Jacket Test requires static balance in a standing position while putting on and removing the jacket. When the subjects performed the affected-side Jacket Test, some compensatory strategies might be conducted, such as using the unaffected side to help complete the major part of inserting the affected side into the sleeve, which might masked some of the balance performances. That might explain the significant correlations observed with the unaffected-side Jacket Test times but not with that of affected-side.

The CIM scores did, though, show a fair to moderate positive correlation with the unaffected-side Jacket Test times. A previous study has found that skill in dressing is one of the most important aspects of independent functioning for persons with profound disability [34]. The moderate correlation could be explained by the fact that the Jacket Test is closely related to ADL competence.

Cut-off time for the Jacket Test

This study also attempted to calculate the optimal cut-off Jacket Test time for distinguishing healthy older adults from people with chronic stroke. There was no significant difference between dominant and non-dominant Jacket Test times in the healthy control. Thus, the Jacket Test time of affected and unaffected side in the stroke group were compared with the mean of dominant and non-dominant Jacket Test time in the healthy control respectively. The optimal cut-off times of 18.33s on the affected side and 18.38s on the unaffected side were determined to discriminate best.

The AUCs of the Jacket Test times ranged from 0.965 to 0.995, which means that the Jacket Test time can give better than 95% accuracy in discriminating people with stroke from healthy older adults. The Jacket Test times showed both high sensitivity and specificity when assessing both upper limbs, which suggests that the Jacket Test has great potential as a clinical screening and diagnostic instrument for discriminating people with stroke from the healthy older adults.

Clinical Implication of the Jacket Test

Dressing, as an important independent functional task of daily living, has been an indispensable skill to help the people with stroke to return to a normal daily life [35]. Although the ability to dress is included some assessment tools about activities of daily living [36,37], those assessment tools take a longer duration to complete in clinical situations [36, 37]. In addition, those measurement tools only focus on whether the participants could perform dressing, but overlook the detail of dressing skill. The Jacket Test, thus, could provide a quantitate result to assess the upper limb motor functions while performing daily functional task. Furthermore, the Jacket Test is easy to administrate and has low time cost. These could increase the values in using the Jacket Test in clinical situations to assess upper limb functions in people with stroke.

Limitations

The Jacket Test emphasizes speed in donning a jacket; it does not assess the quality of the movement. The compensatory strategies used in putting on a jacket should also be a focus in testing, but the test is not designed to do that. A standardised lab coat had been used in this study, the size and style of the lab coat might affect the strategy selected of completing the task. The sample size in this research was based on previous reliable findings, but in retrospect it may have been insufficient to detect significant correlations between certain Jacket Test results and other outcome measures. Further investigation with larger sample size would be essential for prediction and multiple regression analysis, and establishing the Jacket Test times in stroke survivors of different mobility levels.

Each subject performed the test 3 times, introducing the possibility of learning and fatigue effects which might have had some impacts on the results. There was also a significant difference ($p \leq 0.05$) in the gender proportions between the stroke and healthy groups. Gender-related differences in muscle strength [38] and functional task skill [31,32] have been reported in previous studies. With more data added in the future, the gender bias could be eliminated. Note too that our findings and the cut-off times provided here are only applicable to people with chronic stroke and healthy older adults who fulfil the study's inclusion criteria. The present study could not establish any causal relationship between the variables because of its cross-sectional design.

Conclusion

The Jacket Test has good to excellent intra-rater, inter-rater and test-rest reliability when used for measuring the upper limb function of people with chronic stroke. The Jacket Test times significantly correlate with FMA-UE scores, BBS scores, TUG test times and maximum hand grip strength on the affected side. Completion times of 18.33s on the affected side and 18.38s on the unaffected side effectively discriminate people with chronic stroke for the healthy older adults.

The Jacket Test is a reliable and valid measuring tool which can be applied in the clinic to evaluate the upper extremity function of people with chronic stroke.

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Table I. *Demographics for the two groups*

Descriptor	Stroke (n=28)	Healthy control(n=30)	p
Age, year, mean (SD)	57.6 (5.1)	61.8（5.7）	0.733
Gender, M/F, n	18/10	11/19	0.036*
Height, cm, mean (SD)	162.6 (8.6)	159.7(8.6)	0.828
Weight, kg, mean (SD)	66.9 (11.6)	57.0(8.9)	0.223
Body mass index, kg/m^2, mean（SD）	25.2 (2.9)	22.3(2.7)	0.624
Paretic side, L/R, n	9/19	N/A	-
Stroke nature, I/H/others, n	17/9/2	N/A	-
Years post-stroke ,year, mean(SD)	7.5 (4.8)	N/A	-

*$p < 0.05$

NOTE. Values are mean ± SD or as otherwise noted.

Abbreviations: F, female; M, male; L, left; R, right; I, ischemic; H, hemorrhagic

Table II. *Mean values of the Jacket Test Outcome*

Used side / Rater		Time,s, mean(SD)	
		Day1	Day2
Stroke group	Affected		
	Rater 1	28.6(9.4)	28.8(10.6)
	Rater 2	28.5(9.4)	28.7(10.6)
	Unaffected		
	Rater 1	124.8(75.5)	125.4(74.8)
	Rater 2	124.9(75.4)	125.4 (74.9)
Health group	Dominant		
	Rater 1	14.3(3.2)	
	Rater 2	14.1(3.3)	
	Non-dominant		
	Rater 1	13.6(2.6)	
	Rater 2	13.6(2.5)	

NOTE. Values are mean ± SD or as otherwise noted.

Table III. *Mean Values of Jacket Test Completion Time in Healthy Subjects and Subjects with Stroke*

	Stroke(n=28)		Health(n=30)		*p*(Compared with Dominant)		*p*(Compared with Non-Dominant)	
	affected	unaffected	Dominant	Non-Dominant	affected	unaffected	affected	unaffected
Time,s, mean(SD)	28.6(9.9)	125.1(74.1)	14.2(3.2)	13.6(2.6)	＜0.001**	＜0.001**	＜0.001**	＜0.001**
p(Within group)	＜0.001**		0.187					

NOTE. Values are mean ± SD or as otherwise noted.

Table IV *Mean Values of Other Outcome Measures*

Assessment	Subjects with stroke
FMA-UE, score, mean(SD)	34.0(16.5)
Maximum hand grip strength	
Affected side strength , kg, mean(SD)	10.0(9.8)
Unaffected side strength , kg, mean(SD)	28.8(8.3)
FTSTST, time, mean(SD)	15.2(4.4)
BBS, score, mean(SD)	50.4(4.0)
TUG, time, mean(SD)	14.7(3.5)
CIM, score, mean(SD)	44.6(5.5)

NOTE. FMA-UE: Fugl-Meyer assessment for the upper extremities; FTSTST: 5-times sit-to-stand test; BBS: Berg Balance Scale; TUG: timed up and go test;

CIM: Community Integration Measure

Table V *Reliability of Jacket Test Time in chronic stroke*

Used Side	Examiner	Day	ICC(95%CI)	
			Time	
			Affected side	Unaffected side
Intra-rater reliability-$ICC_{3,1}$	A	1	0.845(0.709-0.923)	1.000(0.999-1.000)
		2	0.879(0.774-0.940)	0.999(0.999-1.000)
	B	1	0.845(0.711-0.923)	1.000(0.999-1.000)
		2	0.891(0.795-0.946)	0.999(0.999-1.000)
Inter-rater reliability-$ICC_{3,2}$	A-B	1	1.000(1.000-1.000)	1.000(1.000-1.000)
		2	1.000(0.999-1.000)	1.000(1.000-1.000)
Test-retest reliability-$ICC_{2,1}$	A	1-2	0.795(0.558-0.905)	0.972(0.940-0.987)
	B	1-2	0.781(0.528-0.899)	0.999(0.999-1.000)

95%CI:95% confidence interval; ICC: intra-class correlation coefficient.

Table VI *Correlations Relating Jacket Test Parameter With Other Outcome Measures*

**p*<0.05 **; *p*<0.001

	Affected side		Unaffected side	
	Time	*p*	Time	*p*
FMA-UE	-0.285	0.142	-0.750**	0.000
Handgrip (kg)				
Affected	-0.615**	0.000	-0.400*	0.035
Unaffected	0.208	*r*=0.289	0.060	*r*=0.761
FTSTST (s)	-0.086	*r*=0.664	0.177	*r*=0.368
BBS	-0.015	0.938	-0.424*	0.025
TUG (s)	0.115	*r*=0.559	0.556*	*r*=0.002
CIM	-0.061	0.757	-0.386*	0.042

Values are Spearman rho (*p*) unless otherwise specified as *r*, which are Pearson correlation coefficients.

FMA-UE: Fugl-Meyer assessment for the upper extremities; FTSTST: 5-times sit-to-stand test; BBS: Berg Balance Scale; TUG: timed up and go test; CIM: Community Integration Measure