

TO FIND OUT THE INTER - RATER AND INTRA - RATER RELIABILITY OF MODIFIED RIVERMEAD MOBILITY INDEX IN ASSESSMENT OF MOBILITY OF PARKINSON'S PATIENTS – AN OBSERVATIONAL STUDY

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Abstract: Parkinson's disease (PD) is a progressive disorder of the central nervous system (CNS) with both motor and non motor symptoms. Motor symptoms include the cardinal features of rigidity, bradykinesia, tremor, and, in later stages, postural instability. PD is a common disease that affects an estimated 7 to 10 million people worldwide. More than 2% of people older than 65 years of age have PD among neurodegenerative disorders. Functional tasks such as rolling over in bed or moving from supine-to-sitting that are likely to prove difficult. These activities have a large rotational component of the trunk, typically lacking in many patients with PD. Modified Rivermead Mobility Index (MRMI) is designed to assess functional mobility for people with a wide range of abilities. The Modified Rivermead Mobility Index has been designed to measure wide range of ability to maintain the mobility that make it suitable for using in clinical setting. It is cheap, quick, easy to access and simple to administer for mobility evaluation in parkinson's disease. It is reflective of clinical practice and hence, objective of study is to find out the inter-rater and intra- rater reliability of Modified Rivermead Mobility Index Scale in parkinson's patients.

Methods: An Observational study included 30 patients, both male & female with Parkinson's between age group of 50 to 65 years. The patients were assessed using MRMI scale by two rater for inter-rater reliability and by same rater at different time (24 hours of duration) for test retest reliability.

Results: Data were analyzed by using SPSS software 14.00 by Intraclass Correlation coefficient which showed significant positive correlation between Rater A1 and Rater A2; Rater A1 and Rater B.

Conclusion: The result suggested that the MRMI scale is an easy-to-administer clinical test with intra rater and inter rater reliability in subjects with Parkinson's to assess functional mobility.

Keywords: Parkinson's disease, rigidity, bradykinesia, tremor, postural instability, Modified Rivermead Mobility Index, Reliability.

1. INTRODUCTION

- Parkinson's disease (PD) is a chronic, progressive disease of the extra pyramidal system characterized by the cardinal features of rigidity, bradykinesia, tremor and postural instability.¹
- PD is a common disease that affects an estimated 7 to 10 million people worldwide.
- Population of elderly Indians has increased from 6 to 53/100000.²

- Functional tasks such as rolling over in bed or moving from supine-to-sitting that are likely to prove difficult.
- These activities have a large rotational component of the trunk, typically lacking in many patients with PD.
- The Modified Rivermead Mobility Index (MRMI) (Lennon and Johnson, 2000) is a modification of the Rivermead Mobility Index (Collen, Wade, Robb, and Bradshaw, 1991).^{3,4}
- The Modified Rivermead Mobility Index has been designed to measure wide range of ability to maintain the mobility that make it suitable for using in clinical setting.
- It is cheap, quick, easy to access and simple to administer for mobility evaluation in parkinson's disease.

NEED OF THE STUDY:

- There are already many ways of measuring mobility, but very less are suitable for use in the clinical setting to assess the effects of individual rehabilitation interventions or to measure change over a short term.
- The Modified Rivermead Mobility Index scale has been designed to full fill the criteria that make it suitable for using in clinical setting.
- It is cost effective, quick, easy to access and simple to administer for mobility evaluation in Parkinson's patients.
- It is reflective of clinical practice and hence, this is an effort taken to find out the inter- rater and intra- rater reliability of Modified Rivermead Mobility Index Scale in parkinson's patients.

AIM OF THE STUDY:

- To find out the inter-rater and intra- rater reliability of Modified Rivermead Mobility Index scale in assessment of mobility of Parkinson's patients.

OBJECTIVES:

- To find out the inter-rater reliability of mobility scores measured by using Modified Rivermead Mobility Index in Parkinson's patients.
- To find out the intra-rater reliability of mobility scores measured by using Modified Rivermead Mobility Index in Parkinson's patients.

HYPOTHESIS:

➤ Experimental Hypothesis:

- Modified Rivermead Mobility Index scale is having significant inter-rater and intra-rater reliability in measuring mobility in Parkinson's patients.

➤ Null Hypothesis:

- Modified Rivermead Mobility Index scale is not having significant inter-rater and intra-rater reliability in measuring mobility in Parkinson's patients.

2. MATERIAL AND METHODS

❖ Source of data: Various physiotherapy centers in Rajkot.

❖ Study Design: Observational study

❖ Method of Collection Data:

- Study population : Parkinson's patients
- Sampling method : Purposive sampling
- Sample size : 30 subjects

MATERIALS TO BE USED:

- Plinth
- Chair

- Step up block
- Stop watch
- Data collection sheet
- Assessment form
- Pen and paper
- Consent form

CRITERIA FOR SELECTION:

❖ **Inclusion Criteria:**

- Age 50-65 yrs.
- Male and female both.
- Stage 1.0 – 4 (hoehn and yahr scale).
- Subject clinical diagnosed as parkinson diseased.

❖ **Exclusion Criteria:**

- Wheelchair or bed-ridden patients.
- History of cardiovascular diseases, head trauma or other neurological problems.
- Patient with history of any recent surgeries and musculoskeletal injury.
- Hemodynamically unstable patients.
- Uncooperative patients or patient who is not willing to participate.

METHOD:

- 30 subjects who have been diagnosed as Parkinson's disease and fulfilling the criteria will be selected for the study.
- Before starting the study, brief assessment has been done and written consent was taken from the patients.
- Patients were then explained about the test and procedure to be conducted and asked to perform the tasks in the scale with their maximum effort.

❖ **COMPONANT:**

- Turning Over
- Lying to Sitting
- Sitting Balance
- Sitting to Standing
- Standing
- Transfer
- Walking indoor
- Stairs

❖ The MRMI consists of eight items, each rated between 0 and 5 giving a maximum score of 40: (0-unable to perform; 1-assistance of two persons; 2-assistance of one person; 3-requires supervision or verbal instruction; 4-requires an aid or an appliance and 5-independent).

The patients were assessed using MRMI scale by two rater for inter-rater reliability and by same rater at different time (24 hours of duration) for test retest reliability.

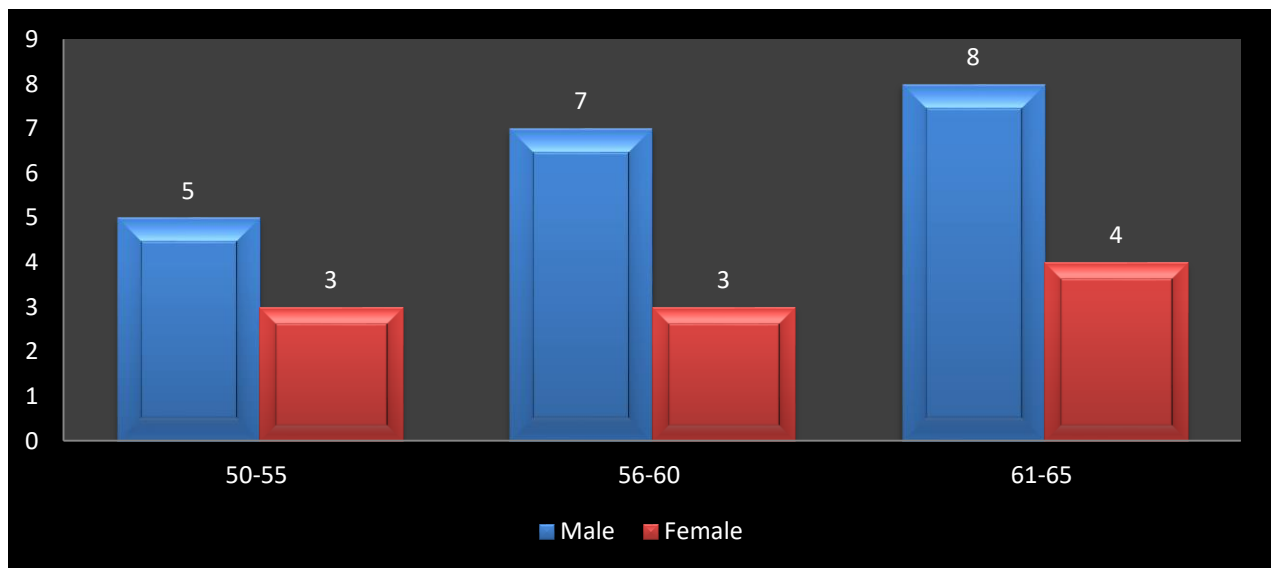
3. RESULTS

- Data were entered in MS Excel 2007 and analyzed using SPSS 14.
- Mean and standard deviation were calculated as measure of central tendency and measure of dispersion respectively.
- Intra rater and inter rater reliability of MRMI scale were assessed by Intraclass correlation coefficient (ICC).
- ICC which showed significant positive correlation between Rater A1 and Rater A2; Rater A1 and Rater B.

Table 1: Age and gender group distribution:

Age group	Male	Female	Total
50-55	5	3	8
56-60	7	3	10
61-65	8	4	12

Graph: Age and gender group distribution:



Measure	Intraclass Correlation Coefficient	p value	No. of patients
Rater A2 (Intra rater reliability)	.998	.000	30
Rater B (Inter rater reliability)	.976	.000	30

- Correlation is significant at the 0.01 level (p value <0.01)
- Above table shows excellent positive correlation between Rater A1 and Rater A2; Rater A1 and Rater B.

4. DISCUSSION

- In this study the result shows that the MRMI scale is a reliable measure in people with parkinson to measure mobility.
- The MRMI requires a minimum of training; this is another important factor in departments with rotational staff and therapists of varying background experience.
- **Lennon S, Johnson L (2000)** investigated The modified Rivermead Mobility Index: Validity and reliability in stroke patients. The results showed that the MRMI was highly reliable between raters (ICC-0.98 ; p < 0.001).⁵

- One main difference in scoring the MRMI in comparison with the original scale (RMI) is that it relies on direct observation of the patient's performance.
- Therapists felt this was necessary if it is to be used to monitor the effectiveness of therapy because of potential discrepancy between verbal reporting and task performance.
- Observation of performance also gives the therapist an indication of how the patient performs which is useful in treatment planning.⁵
- **Johnson and Selfe (2004)** investigated the Measurement of mobility following stroke: a comparison of the Modified Rivermead Mobility Index and the Motor Assessment Scale and concluded that either scale could be used.⁶

LIMITATIONS OF THE STUDY:

- Patients with cognitive impairment are not included.
- Specific age criteria and duration of PD was not taken into consideration.

FURTHER RECOMMENDATION:

- Larger sample size can be recommended for further study.
- Study can be performed to compare if any difference in among acute, sub acute and chronic patients.

5. CONCLUSION

- The MRMI scale is an easy-to-administer clinical test with intra rater and inter rater reliability in subjects with Parkinson to assess mobility. The results of this study show that the Modified Rivermead Mobility Index scale has a high level of reliability when used by experienced physiotherapists with people who have mobility disability caused by a Parkinson's disease.

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Ethical Clearance: From K.K.SHETH Physiotherapy College, RAJKOT.

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