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Occupational Therapy

FUNCTIONAL HAND ASSESSMENTS: A REVIEW FROM THE INDIAN PERSPECTIVE

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ABSTRACT

Introduction: The hand is an amazing, complex part of the human body.. Upper extremity disability can result in disruption of many basic and instrumental activities of daily living. Standardised tests available to evaluate hand function form an important part of the evaluation process.

Purpose of the Study: In view of hand function being affected because of a variety of factors such as age, sex ,geographic regions ,occupations ,and Indian conditions differing from those across the globe,it was felt necessary to review the functional hand evaluations described in literature and estimate its applicability to the Indian conditions.

Methods: Literature search was carried out for articles published till December 2018.The study was exempted from ethics review, since data available in the public domain was reviewed. Patient rated questionnaires were excluded..Static measures evaluation of hand function were excluded Papers describing the original test were studied. Test items described were analyzed. Pros. And Cons were noted. Application to Indian scenario was described

Results and discussion : Application of commercially available tests in the Indian scenario may be limited in view of expenses, cultural differences, space constraints, limited resources, unavailability of Indian norms

Conclusions: What is required for our a developing country like India is Comprehensive CULTURE SPECIFIC hand assessment.Test equipment and procedures should be standardized, inexpensive and transportable. Materials should be readily available in local market, and normative data for Indian culture should be available

KEYWORDS : Hand Function Test, Hand Assessment, Hand Function Evaluation, Culture Specific Hand Assessment.

INTRODUCTION:

The hand is an amazing, complex part of the human body. It is essential for self-care, work and everyday activities. Upper extremity disability can result in disruption of many basic and instrumental activities of daily living. Since severity of injury may not necessarily correlate with functional performance, standardised tests available to evaluate hand function form an important part of the evaluation process. Choosing the most appropriate outcome measure(s), and having a clear understanding of their strengths and limitations, is important in both clinical and research terms.[1-3] The value of a hand evaluation depends on how it incorporates the contributing factors of hand function such as pinch, grasp, precision accuracy, coordination and activities of daily living (ADL) tasks.

Hand assessment consists of an examination of the physical status of the hand and upper extremity, followed by FUNCTIONAL ASSESSMENT, which consists of standardized tests and a variety of non standardized activities of daily living (ADL) or structured activities representing the physical demands of target jobs

•Hand assessments may be clinician observed, clinician assessed or patient rated.

RATIONALE OF THE STUDY

Age, sex geographic regions ,occupations influence human body dimensions.[4] Anjali Nag etal[5] found out that hand breadths, lengths, depths, including finger joints of Indian women studied were smaller than those of American, British and West Indian women. Also,hand dimensions show variation regards sex and population.[6,7]A study conducted by Ali Asgar etal[8]have shown that hand dimensions, hand shape can affect hand grip strength . Riz and colleagues[9]have stated that hand span influences an optimal grip span in female and male teenagers.

•In view of the above, it was necessary to review the functional hand evaluations described in literature and estimate its applicability to the Indian conditions This review study attempts to discuss the same.

OBJECTIVES

1.To conduct a literature search for studies describing tests performing functional evaluation of the hand
2.To discuss the components of some of these commonly used tests
3.To discuss their relevance from the Indian perspective

METHODS

•Literature search (www.pubmed.org, www.rehabmeasures.org, www.googlescholar.com, www.google.com, www.clinicalkey.com) were used to review the components of the available tests evaluating hand function. Key words used were Hand function test, Hand assessment, Hand function evaluation Literature search was carried out for articles published till December 2018.The study was exempted from ethics review, since data available in the public domain was reviewed. Patient rated questionnaires were excluded..Static measures evaluation of hand function were excluded Papers describing the original test were studied. Test items described were analyzed. Pros. And Cons were noted. Application to Indian scenario was described

PARAMETERS RECORDED WERE

·Name of the test
·Number of test items in the hand function test
·Aspect of hand function is being evaluated by the hand function test (Eg. Gross motor/fine motor/Activities of daily living)
·Scoring method(Whether time recorded or numerical scale)
·Pros and Cons of each test in terms of applicability to the Indian scenario

The following tests were reviewed :

Carroll Hand Function Test(1965):[10] This is among the earliest hand function tests described .It consists of 33 test items, and involves tasks such as Placing of objects such as wooden pegs, pipes, marbles from a table to an overhead shelf.

The scoring is on a scale from 0-3, where 3 indicated normal performance, 0 indicated inability. The test evaluates both gross and fine motor function

The test however decribes construction of special shelf and test items(pegs, pipes.) Also , the scale describing the quality of movement from 0-3 may not be sensitive to minor changes in hand function

Jebsen Hand function test(1969)[11,12]: This is among the most widely described performance based tests in literature. It consists of 7 subtests with tasks representative of daily function.Performance is rated based on time taken to perform each task. It is a quick test takes only 15-20 mins and is commercially available. Validated and reliability testing is done . Normative data is available.

However, the test evaluates Unilateral tasks only, either the right, or the left hand is evaluated at one time, Daily activities require use of both hands for a variety of functional tasks. Performance is rated only by time , quality of movement, method of task performance is not evaluated. Moreover,in India, the test needs to be imported . The first task involves writing a sentence in English, which can be a hinderance for the Indian population which ,may not be literate or well versed with the language. The eating simulation test invoves use of spoon only. In the Indian context, this may not be very useful, since majority of the population eats without a spoon

Smith hand function test (1973)[13]: This test consists of tasks representative of daily function(unilateral tasks, ADL, Writing & Grip strength)

The test items consist of 13 test items, which were evaluated under 4 sections, , with both unilateral and bilateral tasks. It assesses dexterity, strength, shoulder as well as elbow range .However, participant performance is rated only in time. The test requires construction of board for the activities of daily living, and peg placing test items , and also a dynamometer. The writing subtest involves signature, this may be a problem with a population where languages are varied and literacy is an issue. Also, individual signatures may vary, so standardization of the same will be difficult. The test is also not validated on a large population

Sollerman Hand Function Test(1985)[14]: This was described initially for persons with tetraplegia.

It consists of 20 subtests, which use seven most frequently used grips (described by Napier etal)The test items simulate daily living tasks. 'Prescribed' hand grips given for each task and the performance of the subject is scored from 0-4, where 4 indicated better score. This test too involves writing a name on a paper,, so literacy and language will be an issue in Indian population. Since 'prescribed' hand grips are described, trained personnel may be required to administer the test. Also, the test equipment needs to be mounted, hence, set up is required.

Wolf Motor function test (2001)[15]: The test, described in 2001 , is a tiime based technique to calculate upper extremity performance..It also describes an additional scoring with Functional Ability scale. The test consists of 17sub tests .Videotaping used for standardization and scale rating. However, the test takes 60+ mins to administer. Videotaping requires room of minimum dimensions of 17'* 10', and the test is validated only on stroke, multiple sclerosis and traumatic brain injury

Southampton Hand assessment (2002)[16]: This is a commercially available test which consists of 26 timed tasks (12 abstract and 14 ADL items). The test focuses on unilateral performance, and time taken and appropriate grip pattern recorded. The test is however not compared with a ' gold standard' , hence criterion validity has not been established. Also, as per the test description, one of the subtests requires pouring of water, so spilling may occur, especially in population with poor hand and upper extremity control

Chedoke Arm and Hand Activity Inventory(2004)[17]: The test , described in 2004, to evaluate the ADL ADL aspect of the hemiplegic hands. The purpose of this measure is to evaluate the functional ability of the paretic arm and hand to perform tasks that have been identified as important by individuals following a stroke.TheCAHAI-13 Version consists of 13 items of daily living, which are easily available, and performance is graded on a score from 1-7, with 1 being complete assistance and 7 being complete independence. Task component chart has been used to determine what. part of the task the affected limb performed. The test assesses bilateral hand function. The test has good validity and reliability, however, is specific to stroke patients only.

TRI- Hand Function Test(2012)[18]: This test was described for evaluation of tetraplegic hands. It consists of 14 test items, which measure specifically unilateral gross motor function focusing on lateral pinch, pulp pinch & palmer grasp . Performance is scored on a scoring system of 0-7 where 7 indicated better scores . The test is however specific to Spinal cord injury patients , where initiation and completion of task was documented. There is no provision for documentation of further improvement once task is completed.

It is important to know **How Indian conditions differ, in relation to the western system**

·Majority of Indians eat with hand as compared to those earing with spoon abroad.Chapatti is staple food, which requires dexterity skills for eating.

·Rehabilitation facilities are still limited in our country. There is scarcity of funds, limited access to expensive equipment for rehabilitation

·Commercially available tests are expensive, with limited access to all. There are recurring costs and maintenance of equipment. Also, purchase of different evaluation tests for different diagnosis is not always feasible, in terms of costs as well as storage

·Unavailability of dedicated space in public hospitals in cities , limiting use of evaluation tools that may require space

·With a huge therapist to patient ratio, time constraints are a major problem

CONCLUSION

What is hence required for our a developing country like India is hence, a Comprehensive CULTURE SPECIFIC hand assessment, with unilateral and bilateral activities included.It is also important that the results of the test should recorded both in time taken for completion and quality of movement used for performance.Test equipment and procedures should be Standardized, inexpensive and transportable. Materials should be readily available in local market, so that replacement is not expensive. Most important, normative data for Indian culture should be available to compare and document results.

LIMITATIONS

An evaluation of all measures of hand function was beyond the scope of this study. All tests were not available in Indian setup, hence review of most of the tests was based on full texts of the articles available in literature.

The authors declare no conflict of interest

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