

Research on Computerized Screening Tools for Dementia

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1. Introduction

The number of dementia patients is increasing according to progress the elderly society all over the world and going up the probability to be dementia patient for elderly people is inevitable consequence. MD D. R. Na, a neurologist, wrote in his book that we have no choice but to be dementia patient before ending his/her life. If so, it will be necessary to classify the elderly people by several stages through the screening test and applying the proper remedy or taking the preventive measures could be processed.

In this research, MMSE, the most extensively used screening tool for detecting dementia, is analyzed with strengths and weaknesses and the opinions are suggested for the computerized screening tools for dementia.

2. MMSE

MMSE is acronym of Mini-Mental State Examination and Folstein and McHugh developed in 1975. MMSE is a paper and pencil examination to screen the cognitive ability in a short time and is most widely used in the world. Several Korean versions of MMSE are developed like MMSE-K, K-MMSE, and etc. Y. C. Kwon and J. H. Park modified MMSE as MMSE-K and Y. U. Kang, D. R. Na, and S. H. Han localized as K-MMSE. Two screening tools are very similar in large and the differences are shown on language part, consideration of uneducated/illiteracy, and points consideration on age and sex.

MMSE tests eight brain impairments as orientation of time and place, memory registration, attention & calculation, memory recall, language, repetition and complex commands. More specifically,

- Orientation of time : From broadest to most narrow. For example, year-month-day-time. Orientation to time has been correlated with future decline. (5 points)
- Orientation of place : From broadest to most narrow.(5 points)
- Memory registration : Repeating 3 objects. (3 points)
- Attention and calculation : Abstracting by 7 five times from 100. (5 points)
- Memory recall : Recall 3 objects registered. (3 points)
- Language : Naming a pencil and a watch. (2 points)
- Repetition : Speaking back a phrase. (1 point)
- Complex commands : Varies. Can involve drawing 2 pentagons shown. (6 points)

It takes about 10 minutes for the questionnaires. Total point is 30 and more than 23 points is judged to be normal. 18~23 and less than 18 are judged to be mild cognitive impairment(MCI) and dementia respectively. MMSE calls severe dementia for under 9 points.

3. Analysis of MMSE and the computerized screening tools

The cognitive screening tests are divided by traditional and computerized and The traditional tests are separated by interview and paper & pencil. MMSE is traditional and paper & pencil test.

The strengths of MMSE are most widely used screening tool and easy to test. But the back side of test convenience is the reliability of test results and has been issued steadily and especially on classification of MCI. Since uneducated/illiteracy for the aged over seventy is not small population in Korea and explanation and help from tester is necessary sometimes, time and cost of expert is needed and the reliability of test results is declined by inconsistency of test environment.

The computerized screening tool has strength with standardization, minimizing the interference for tester attitude and test environment, exactness of testee's response time, and automation of scoring. But the weakness can be found on the elderly person's computer usage avoidance. It may interferes the test results.

4. Conclusions

The computerized screening tool for cognitive impairment would be a good substitute for traditional tool in the near future. Measuring the cognitive impairment makes possible (1) to classify the potential dementia group and guide to hospital for a close examination, (2) to progress the preventive training program for normal and MCI groups. In that point of the base line, this could be a national concern.

The development of the convenient and proper computerized screening tools to be tested at home and to spare time and cost of experts would be very important.

5. References

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