Geriatric Background

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Abstract: Population aging will have an influence on pathologies associated with extreme old and dementia. Some aspects of cognitive functions, especially memory, and other thinking abilities decline as part of the normal aging process. When cognitive decline is suspected, a neuropsychological evaluation can provide an objective assessment of cognitive functioning. Neuropsychology is converged from the parent disciplines of neurological medicine and psychology. The neuropsychological evaluation typically includes a clinical interview, the administration of objective standardized measures of cognitive functioning and mood, and feedback to the referral source or the patient. Neuropsychological evaluations provide the clinician with objective measures that form the basis of decisions relating to the potential for rehabilitation, return to work, independent living, and competency issues.

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INTRODUCTION

In most countries worldwide, even in developing countries, people are living longer than before. Population aging will have an influence on pathologies associated with extreme old and dementia. Some aspects of cognitive functions, especially memory, and other thinking abilities decline as part of the normal aging process. Normal age-related cognitive decline and disease-associated cognitive impairment can be difficult to differentiate in the typical patient-physician interaction. It is essential that clinician’s recognize even modest changes in thinking ability in the geriatric patients. When cognitive decline is suspected, a neuropsychological evaluation can provide an objective assessment of cognitive functioning. The neuropsychological evaluation can be viewed as an extension of the bedside mental status examination. The neuropsychological evaluation typically includes a clinical interview, the administration of objective standardized measures of cognitive functioning and mood, and feedback to the referral source or the patient. Neuropsychological evaluations provide the clinician with objective measures that form the basis of decisions relating to the potential for rehabilitation, return to work, independent living, and competency issues.

Today it has become obvious to say that people live longer than in the past, and consequently, elderly people are more and more numerous. In previous years physiological cerebral ageing was commonly described as opposed to pathological ageing. Physiological cerebral ageing was the ageing
considered as normal, as a kind of genetic necessity, while different forms of dementia among the elderly constituted pathological cerebral ageing.  

NEUROPSYCHOLOGY

The two principal aspects of clinical neuropsychology are clearly outlined by Luria, one of its ablest practitioners and developer of an influential theory, whose principal features are outlined below.

"The study has two objectives. First by pinpointing the brain lesions responsible for specific behavior disorders we hope to develop a mean of early diagnosis and precise location of brain injuries. Second, neuropsychological investigation should provide us with a factor analysis that will lead to better understanding of the components of complex psychological functions for which the operations of the different parts of the brain are responsible (Luria, 1970)."

This twofold nature of neuropsychology means that by utilizing appropriate tools and concepts to examine brain-behavior relationships may be in a position to further our knowledge of the nature of the psychological processes themselves. Neuropsychology has already given us greater insight into some of the processes of perception, memory, learning, problem solving and adaptation, a branch of study much expanded in recent years and termed cognitive neuropsychology.

Leaving aside the psychological measures themselves since they are dealt with later, there seem to be a number of concepts developed only in recent years which are proving very fruitful. Among these the following four are chosen as they provide a basis for what follows: (1) the adoption of the syndrome concept as against the unproductive ‘unitary’ concept of brain damage; (2) a re-evaluation of the concept of ‘function’ and the development of the concept of functional systems as the neural substrates of psychological process; (3) the use of ‘double dissociation’ of function to strengthen the certainty with which statements may be made concerning the relation between anatomical lesion and behavioral disturbance; and (4) the development of the notion of the ‘disconnection syndrome’ to explain neuropsychological findings and to predict others.

NEUROPSYCHOLOGICAL EVALUATION

Brain damage, in elderly people with normal aging or with pathological aging, may produce different types of effect in any individual: (1) a general deterioration in all aspects of functioning; (2) differential (group) effects, depending on the location, extent and other characteristics of the damage; and (3) highly specific effects in certain locations. Each of these needs to be taken into account when interfering the reason for poor test performance.

Tests validated on clearly defined group (e.g. brain damaged versus normal) may have low predictive validity. If it can identify ‘only those subjects whose brain damage is obvious, then the test serves no useful purpose, since it confirms what need no confirmation’. A crucial study would be one in which neurological group is made up entirely of subjects for whom neurologists disagree as to diagnosis or are unable to make a diagnostic statement at the time the psychological measure is obtained and for whom retrospective diagnosis is possible.

Another shortcoming of studies relates to the principle of multiple determination. ‘Behavioral deficits are define in terms of impaired test performance. But impaired test performance may be a final common pathway for expression of quite diverse types of impairment’. It is therefore important to be aware that low scores on such complex tasks may be due to a disturbance in any of the functions involved or any combination of them. If complex tests must be used, two methods of clarification are possible: (1) to observe the sharing of variance between a patient’s performance on sundry test; and (2) to test hypothesis about the various possible reasons for failure.

Many psychological tests are concerned solely with whether or not the subject can reach the goal. ‘The flexibility of cerebral mechanisms is such the solution of most test items can be reached by many devious routes. The method the subject uses in tackling a problem will in general provide more information as to the character of a skill or of
a psychological deficit than will the knowledge as to the subject’s success of failure (Elithorn, 1965). Qualitative observations are of paramount value and no amount of qualification will override the importance of the psychologist as an observer of behavior. Behavioral observations can reveal important information regarding the mental status and neurologic function of the patient.

There is a danger in assuming that if a patient fails on a test then the patient has a deficiency in the psychological function stated by manual to be what the test measures. However, ‘most tests have only an indirect relationship with the variables they are supposed to measures’ (Shapiro, 1973). Many tests are multi factorial in their composition and hypothesis about the possible reasons for poor performance need to be examined. This process may involve the use of other tasks, but may also be solved by noting the performance of the subject on the test already performed. The multi factorial determination of the test scores is one of the stumbling blocks of deriving interferences from group data since ‘Different individuals may obtain the same test score on a particular test for very different reasons’ (Ryan & Butters, 1980).

On the other hand, multiple failures on seemingly disparate tests may reflect a common disorder. The magnitude of the failure on separate tests will be a reflection of the degree to which the disturbed function is represented in their composition. In most situations only a small number of functional disturbances will account for the many observed deficits in performance.

A further difficulty with tests is that the frequently used aggregate indices may bury the very data which is of significance in understanding the patient’s difficulties. A classic example in pseudoneurological cases is the falling of easy items accompanied by passes on the more difficult ones, although the summed score is ‘within normal limits’ or ‘fails to meet the cutting point’. Internal consistency is an important element of the interpretation of test performance, also in geriatrics. A summary score may lead some to assume that it has.

Identification of clinically relevant cognitive change through serial assessment is becoming increasingly prevalent in neuropsychology, and has particular importance in older adult populations. The accurate diagnosis of dementias and other progressive neurologic conditions is often better characterized by a pattern of change over time than a pattern of cognitive performance at any one point in time. For the clinician, the datum of most interest is not he group mean but rather the raw change score. Clinical relevance of the raw change score is based on its prevalence in the normal population. However, studies have suggested that raw change score can be affected to varying degrees by psychometric confounds such as practice effect and regression-to-the-mean that obscure their clinical relevance.

Physicians will refer patients for neuropsychological evaluation if the history suggests decline in one or more areas of cognitive function (eg, memory, language, attention, perception), or the patient or family members report cognitive changes. In clinical practice, warning signs that suggest a neuropsychological evaluation may be advised include repetitive speech, missing appointments or arriving on the wrong day, difficulty complying with medical recommendations, and forgetting to take, or taking too much, medication.

Although the neuropsychological evaluation can provide essential information to clinicians, it is not without limitation. Completion of formal cognitive tests requires patient’s active participation. If the patient is unwilling to put forth effort, test score likely underestimate true abilities, and may lead to misinterpretation of the test performance.

**TOOLS SELECTION**

Knowledge of syndromes and brain-behavior relationships will be the principal factor in determining the selection of tools. This knowledge will answer commonly occurring questions. However, there will be questions that will require ‘special’ tools which will produce pathognomonic data. Test selection should be germane to the question asked. Neuropsychologist will gradually develop quiet a large armamentarium from which to choose. Such test familiarity is necessary for the rapid and economic evaluation associated with the branching decision-making process which is the basis of
clinical evaluation using a flexible or individualized method. ³

The selection of tests may entail a one-step process, for instance a group of tests is chosen in the belief that these will provide the information needed. Sometimes the issues will remain unresolved but observations derived from the primary set of tests may suggest that further specific tests may provide the answer. Much of the efficacy of this method turns on the selection of the primary group test, since the use of tests which do not touch the problem at all will give negative results. In reporting such negative results, it is important to inform that ‘nothing abnormal was detected with the tests used’. These should be documented in hospital practice and in medico-legal cases. Unfortunately, negative reports are often written which contain the implication that no impairment is present. We should keep in mind Teuber’s dictum ‘absence of evidence is not evidence of absence’ (of impairment). The obvious principle of neuropsychology: ‘one cannot determine whether a certain function of the brain is impaired unless that function is tested’. ³

Each test used in neuropsychological evaluation has its own limitations. Novella et al. studied 148 subjects over 60 years old to evaluate the acceptability, feasibility and validity of employing a generic quality of life questionnaire, the Duke Health Profile. They concluded that even the questionnaire is a good instrument, it is inadequate for studying perceived health and self-esteem. Even with improvement, the questionnaire will have limitations, especially in advanced stages of dementia.

The interpretation of neuropsychological test data must consider other factors influencing performance, such as the individual’s background, education, and level of motivation while taking the test. The length of neuropsychological evaluations varies depending on the setting and the nature of the referral question. The tasks are usually presented one-on-one in an office-like environment. Tasks are presented in multiple modalities, with the majority of tasks being presented aurally or visually, although some tasks can be presented via tactile or olfactory stimulation depending on tasks and patient need. ¹

Many tests are available to be used in neuropsychological evaluations. Some of them, such as the Mini Mental State Examination (MMSE), the Clock Drawing Test (CDT), the Functional Activities Questionnaire (FAQ), the Activity of Daily Living (ADL), the ADAS-Cog, the Neuropsychiatry Inventory (NPI), and the Clinical Dementia Rating (CDR) are commonly used for neuropsychological evaluations in daily clinical practice. ³ Unfortunately there are limited number of tests in neuropsychological evaluation that originally created in Indonesian language. A few of these instruments have been translated for use with Indonesian speaking patient; however, these versions tend to lack the comprehensive normative data that is essential for clinician decision-making. Therefore, the interpretation should be made more carefully.

CONCLUSIONS

Some aspects of cognitive functions, especially memory, and other thinking abilities decline as part of the normal aging process. Normal age-related cognitive decline and disease-associated cognitive impairment can be difficult to differentiate. It is essential that clinician’s recognize even modest changes in thinking ability in the geriatric patients. When cognitive decline is suspected, a neuropsychological evaluation can provide an objective assessment of cognitive functioning.

Physicians will refer patients for neuropsychological evaluation if the history suggests decline in one or more areas of cognitive function (eg, memory, language, attention, perception), or the patient or family members report cognitive changes. Identification of clinically relevant cognitive change through serial assessment is becoming increasingly prevalent in neuropsychology, and has particular importance in older adult populations. Although the neuropsychological evaluation can provide essential information to clinicians, it is not without limitation. Many tests are available to be used in neuropsychological evaluations. Unfortunately there are limited number of tests in neuropsychological evaluation that originally created in Indonesian language, therefore interpretation should be made more carefully.
REFERENCES


