Mini-Emotional State Examination for dementia patients

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Aim: Emotional functions, as well as cognitive functions, are critical factors to assess in the care and management for dementia patients. In addition to the Mini-Mental State Examination (MMSE), we have developed a Mini-Emotional State Examination (MESE) for the examination of emotional functions in patients with dementia.

Methods: MESE consists of a two-part questionnaire. The first probes emotional functions within the five senses (visual, auditory, tactile, smell and taste). The second explores more complex and comprehensive emotional functions including feelings of tenderness, violence, happiness and sadness, as well as emotional responses to more general human, moral and social phenomena. The questionnaire comprises 30 questions and is scaled to a 30-point healthy maximum. A total of 40 dementia patients in Sendai Tomizawa Hospital were tested with MESE.

Results: MESE point scores were roughly parallel to the scores on the MMSE, but MESE scores were widely distributed, independent of MMSE score. MESE scores in nine patients exceeded 23 points.

Conclusion: The difference in distribution of MMSE and MESE scores show that cognitive and emotional functions are independently affected in dementia, and therefore assessment of both these functions should be cared taken into consideration in the care and management of dementia patients. Geriatr Gerontol Int 2014; 14: 508–513.

Keywords: cognitive functions, dementia patients, emotional functions, Mini-Emotional State Examination, Mini-Mental State Examination.

Introduction

Brain functions can be separated into those primarily associated with the neocortex for cognitive function, and those primarily associated with the limbic system for functions of instinct, emotion and feelings of comfort or discomfort.1 These interact in a variety of ways. For example, various kinds of strong projections arising from the limbic system could in turn drive cognitive decisions based in the neocortex. Conversely, the limbic system can play a role as the functional driver, with the neocortex functioning as a tool.2 Under pathological conditions of a decline in neocortical functions, as in dementia, patients are more likely to show negative emotions associated with the limbic system, such as anger, excitability and anxiety (typical of behavioral psychological symptoms of dementia [BPSD]). Such dementia patients with BPSD are usually treated with psychotropics, including antipsychotics. However, many side-effects of these medications, especially antipsychotics, have been documented.3 We have previously shown that emotional stimuli of a favored nature to the limbic system can be an effective treatment of BPSD without any side-effects.4 Although functions of both the limbic system as well as the neocortex are key to the care of dementia, many studies on dementia have focused simply or solely on cognitive neocortical functions; there have been few reports on and little attention paid to emotional functions of the limbic system. In the present study, we have developed a Mini-Emotional State Examination (MESE) as a practical method for grading the emotional state of the limbic system, and compared this with the Mini-Mental State Examination (MMSE) for neocortical function in dementia patients.5

Methods

MESE is a two-part questionnaire assessing two different classes of emotional function. The first examines the emotional component of the five senses (visual, auditory, tactile, smell and taste); the second part examines more complex and comprehensive emotional features and feelings of well- or ill-being. MESE consists of a
series of questions, with healthy answers given one point each, thus a maximum of 30 points, with higher scores indicating a healthier emotional state (Table 1). The visual sense is probed through responses to three questions regarding expressions of laughter, crying or anger, respectively, through sketches on paper (Fig. S1). Two auditory sense questions are asked correlating nonsense words with rounded vowels (e.g. “bouba”) to rounded drawn shapes and nonsense words with sharper vowels (e.g. “kiki”) to angularly drawn shapes (Fig. S2). Response to tactile sense is assessed by comfort or discomfort level to a massage administered on an acupoint (“Shinchuu” in Japanese, “Shenzhu” in Chinese, GV 12, between third and fourth thoracic vertebrae). Smell and taste are independently assessed by asking caregivers about the level of pleasure the patient shows during eating or drinking. This sensory component of the MESE thus comprises a potential total of eight (maximum visual = 3, auditory = 2, tactile = 1, smell = 1, taste = 1).

In the second part of the questionnaire, more comprehensive emotional functions are probed within the context of seven categories. Categories one and two are general, and respectively assessed the patient’s tenderness of mind towards family or the caregiver, and whether positive emotions of pleasure or negative emotions including aggression or violence seem to dominate.

After this, these more complex emotional functions are more deeply probed within five additional categories of questions, each of which consists of four items, thus totalling 20 potential points. Each question is asked by showing a single representative picture (Figs S3–S22), and a healthy response is judged if the patient shows appropriate understandable and sympathetic feelings.

Category 3: The human condition. This category comprises the patient’s response to four short stories. One is “Love Letter”, a tearful story written by an old woman who had lost her husband in World War II, just after getting married. “Delicious” was written by a woman as a poignant memory of dinner just after her husband had come back from Siberia, having been detained for 7 years after World War II. “The Little Match Girl” is a famous fairy tale written by Hans...
Christian Andersen in 1848. “The Last Leaf” is a well-known story written by O’Henry in 1905.

Category 4: Morals. Emotional responses with moral content are probed again with an assessment of the patient’s response to four stories. “A Spider’s Thread” is a famous story of an egotistical man descending to hell, written by Ryunosuke Akutagawa in 1918. “Songoku” is a monkey-tailed boy character in a modern version of a tale originating in “Saiyuuki”, an ancient Chinese novel from the 16th century. Next is a tragic story of the renunciation of an old parent, typically carried into the mountains to die, given times of extreme famine. Finally, there is the story of Sunemon Torii, a famous Japanese foot soldier, who sacrificed himself in order to save friends in Nagasuno castle during battles between Nobunaga Oda and Katsuie Shibata in 1575.

Category 5: Emotional responses to happiness. These comprise the appropriateness of the patient’s response to four figures: a boy crying out of fear of a demon’s mask, a couple in love at a festival, a man smiling in a hot spring and a group of neighbors visiting during a tea party on a veranda.

Category 6: Emotional responses to social experiences. Four more stories are told, and the patient’s response is assessed. The first is a famous and sad children’s song of an elephant that was sacrificed in Ueno zoo during World War II, written by Mado Michio in 1953. Next is a story about human beings being the most dangerous animal in the world, popularized in black humor in a zoo in England. This is followed by a story of an awkward, but popular, dolphin in an aquarium. Finally, there is a story of the Great East Japan Earthquake of 2011, which destroyed many things, and in which a young lady sacrificed herself by continuing her calls of alarm both before and during the tsunami itself.

Category 7: Emotional responses to sadness and poignancy. Here again there are four stories. The first is a picture of a soldier during World War II simply holding a little dog. Next is a story of a young mother holding two children, one who has died and another injured, just after the atomic bomb devastation of Hiroshima in 1945. A similar photograph, taken by J O’Donnell, shows a boy carrying his young sister, now dead and waiting for cremation, following the second atomic strike against Nagasaki in 1945. Finally, there are the tragic stories of the Japanese war orphans, who, on their evacuation from China to Japan after Japan’s defeat, died of starvation on the ships, with their bodies simply thrown into the sea.

With this new instrument, we studied 40 dementia patients who were stable for 2–4 weeks after admission to Sendai Tomizawa Hospital, a psychiatric hospital for dementia patients. All patients were diagnosed according to the Diagnostic and Statistical Manual of Mental Disorder, Fourth Edition criteria. All patients could eat food by themselves and could articulate other feelings of comfort or discomfort. Some psychotropics including antipsychotics were prescribed as necessary, and their BPSD were stable for 1 month. Written informed consent was obtained from participants or their families. Trained nurses directly observed the patients and carried out MESE, MMSE, Barthel Index tests and Neuropsychiatric Inventory (NPI; lower score shows better performance) in a blinded manner to treatment status. Results were analyzed using paired Wilcoxon tests. Results were considered to be statistically significant at P < 0.05. Data are expressed as mean ± SD.

**Results**

MESE were carried out on 22 women and 18 men (81 ± 9 years, Barthel Index 42 ± 23, NPI 23 ± 16 and MMSE 12 ± 6). Figure 1 shows the relationships between the MESE and MMSE. There was a roughly parallel relationship between them (P < 0.05). Nine patients showed MESE above 23 irrespective of MMSE. There was no relationship between MESE and NPI or Barthel Index.

**Discussion**

In contrast to MMSE, which focuses on cognitive functions of the brain, such as word recall, number recall, arithmetic calculation and so on, the MESE explicitly
probes organic feelings of comfort or discomfort in a variety of settings, including those associated with the human condition, moral sense, social sense, feelings of happiness and sadness. Many patients showed deep emotional states; we have observed choking with tears while participating in the MESE. Participating in the MESE examination is itself a kind of psychiatric therapy. On occasion, patients refused to continue the MMSE examination, perhaps due to its questions being too simple, but in the case of MESE, the patients willingly participated, perhaps due to its evoking intense and profound emotional feelings. It takes approximately 15–20 min to complete MESE examination.

To be sure, much of the scoring system is subjective; but examiners were reasonably consistent in their judgments of appropriateness on responses. When 20 patients were examined by the same examiner, their repeated MESE points did not differ by more than three points, showing relative robustness in this instrument.

Emotional status, such as depression and suicidal thoughts but mood, have been reported, but these pathological emotions are the emotional functions of Alzheimer’s patients. A score on the emotion recognition task was expressed by understanding the facial expression of emotions. We recognize that the emotional responses to issues of the human condition – morals, happiness, sadness and social phenomenon – certainly depend on a variety of factors, including the lifestyle of each individual person, but are also dependent on social factors, such as culture, religion and history; these might not be universal. The present MESE was specifically written for the Japanese population, and might of course require revision for patients in other countries.

We emphasize, that despite its rough nature, the MESE that we are proposing here will be a useful adjunct to the care and management of patients with dementia. Importantly, the level of cognitive decline and emotional decline appear to be independent features of patients with dementia, and that therefore independent assessment of these features would be important. As we found, there is a rough relationship between the cognitive and emotional functions, but it is by no means one-to-one. That is, there appears to be an independent emotional component that is not associated with cognitive measures, such as the MMSE. It was indeed surprising that some dementia patients showed a healthier emotional response irrespective of cognitive function (even though most patients showed impairments of both cognitive and emotional functions).

Finally, we note that even with a serious decline in memory, many features of BPSD are retained. This suggests that the limbic system function is relatively well-retained. In these patients, the applications of pleasant sensory stimuli might help the person to avoid a BPSD outburst and other inappropriate behaviors. Such stimuli also help in the recovery of cognitive function.

The important point is that an appropriate balance between neocortical function and limbic function is the essential characteristic to promote “balanced” aging. An inappropriate emphasis on either one, to the exclusion of the other, is detrimental to overall health, especially in the geriatric population.

Disclosure statement

The authors declare no conflict of interest.

References

Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher’s web-site:

Figure S1 Three expressions are shown. The participants are asked to point out which shows laughing, crying or angry expressions. Correct selections are 1 point each.

Figure S2 Rounded and angular shapes are shown. Auditory sense is probed by asking which sketch corresponds to a nonsense but rounded word “bouba”, and which to a nonsense but shaper word “kiki”. Participants point to their choices, and correct responses are 1 point each.

Figure S3 “Love Letter” is shown, which was written by an old woman who lost her husband in World War II, just after getting married (Take Yanagihara. “Love letter for you in heaven”. In Koibumi, Futatsui-machi, NHK, 1995). She brought up their children, and when she died and soon thereafter met her husband in heaven, she wanted to be praised and tightly held by her husband, never to be separated again. The participant is asked his/her impression after hearing the “Love Letter” story; if the subject shows understandable, sympathetic and emotional responses instead of inappropriate, repetitive or unrelated impression, a score of 1 point is recorded. This same criterion is used for healthy responses to the remaining stories.

Figure S4 The story, “Delicious”, is showb (Nobuyoshi Hikoda. “Delicious”; in Special stories of mindful memoirs. Choubunsha, 1993). Because there was no sake on her husband’s return from Siberia after a 7-year detention after World War II, she could only serve hot water at dinner; but her husband thanked her and said “delicious” and both felt their sufferings comforted.

Figure S5 The famous fairy tale of “The Little Match Girl” written by HC Andersen in 1848 is shown. In freezing weather, a poor little girl burns matches that she is trying to sell in order to keep warm. She sees visions of her deceased mother and grandmother, the only ones to have shown her love and kindness. She finally dies, and joins them in Heaven.

Figure S6 The famous short story “The Last Leaf” written by O Henry in 1905 is shown. A sick woman who believed she would die when all the leaves on a vine had dropped, finds one leaf remaining. Unknown to her, an old man had painted a leaf on her window to save her lest the last leaf falls. As the painted leaf remains, she does not die, but makes a full recovery.

Figure S7 The famous novel “A Spider’s Thread” written by Ryunosuke Akutagawa in 1918 is shown. Buddha wanted to help an egoistical man from hell using a spider’s thread, because the man had once saved a spider. On his way of climbing up the thread to escape, others try to follow, and the man claims the thread is his alone. The thread breaks, and he falls back down to hell.

Figure S8 “Songokuu” (the leading actor of Chinese ancient novel, “Saityuu” in 16th century) is shown drawing his name on a pole after flying away for a long distance, but he realized that it was inside the hand of Buddha.

Figure S9 The famous old Japanese tale, “Narayamabushikou” in which a son must carry his mother to die in the mountains due to famine. Despite being renounced, she breaks branches on her way in order to mark a return path for her son.

Figure S10 The famous Japanese foot soldier, Suneemon Torii, who was captured on his way returning Nagashino castle. His captors tried to force him to tell his friends that reinforcements would not come and they should surrender, but instead, he told them that reinforcements would soon arrive. For this he was crucified.

Figure S11 A crying boy is shown, having been frightened by a demon’s mask. Patients are questioned about what he is doing and why.

Figure S12 A couple in love at a festival is shown. Patients are asked about their relationship.

Figure S13 A smiling man in a hot spring is shown. Patients are asked how he feels.

Figure S14 Neighbors gathering for a tea party on a veranda are shown. Patients are asked how the people like the tea party.

Figure S15 An elephant, starving and forced to perform in order to get food is shown. But during World War II, all animals in Ueno zoo were starving; they were all killed. After the war, elephants were presented by India as gifts; there is a famous children’s song of this story by Mado Michio (1953).

Figure S16 A large mirror inside a cage with no animals is shown. Visitors realize that the most dangerous animal in the world is human, as seen in the mirror.

Figure S17 A dolphin in an aquarium where an awkward, but popular, dolphin jumps behind other dolphins is shown. Patients are questioned if there are similarities in human behavior, and if they feel awkward or respectful.

Figure S18 A destroyed town office in Minamisanriku-cho, Miyagi, Japan is shown, where a young woman had been continually broadcasting tsunami alarms. She continued this to her sacrificial death on 11 March 2011.

Figure S19 A soldier in a special attack corps during World War II is shown, simply holding a little dog before a sortie in 1945. The soldiers were 17-years-old.

Figure S20 Hiroshima city just after atomic bomb strike in 1945 is shown. A young mother is holding two children, one has died and another is injured. A passerby asks after her children, but there were no words of consolation for her.
**Figure S21** A boy carrying his dead young sister, waiting for her cremation just after the atomic bomb in Nagasaki in 1945 is shown. The boy is at stiff attention in preparation for the photograph.

**Figure S22** A ship returning home from China after World War II, in which many war orphans were starving is shown; some of them died every day. Children who had died were buried at sea, marked by the tolling of the ship’s horn and a rotation of the ship around the burial site.

'‘The 22 supplementary figures and figure legends are presented in order in Table 1.'