Ponašajni i psihološki simptomi demencije (BPSD)

/ *Behavioural and Psychological Symptoms of Dementia (BPSD)*

Steven G. Sclan

PsyKorr, Inc. , Miami, SAD i Berlin, Njemačka

/ PsyKorr, Inc., Miami, USA & Berlin, Germany

Demencija je sindrom koji obuhvaća tri klinička elementa: smanjenu kogniciju, nedostatke u sposobnostima prilagodbe (tj. svakodnevnim životnim aktivnostima [ADL; prema eng. activities of daily living] i/ili instrumentalnim životnim aktivnostima [IADL; prema engl. instrumental activities of daily living]) te poremećaje u ponašanju. Prema novijim istraživanjima, unatoč smanjenoj kogniciji, poremećaji u ponašanju predstavljaju glavni izvor stresa i/ili tereta za njegovatelja pacijenta. Istaknuti odnos između poremećaja u ponašanju i stresa/tereta njegovatelja vrlo je često glavni okidač za hospitalizaciju pacijenta. Svrha je ovog rada ponuditi kratak osvrt na fenomenologiju i određene odabrane kliničke aspekte ponašajnih simptoma demencije.

/ Dementia is a syndrome that entails 3 clinical elements: decline in cognition, deficits in adaptive capacities (i.e., activities of daily living [ADL] and/or instrumental activities of daily living [IADL]) and behavioural disturbances. Intriguingly, despite the cognitive decline recent research indicates that the behavioural disturbances are the major source of stress and/or burden for the caregiver of the patient. Furthermore, the prominent relationship between behavioural disturbance and stress/burden of the caregiver is quite often the major trigger for institutionalization of the patient. The purpose of this presentation is to briefly review the phenomenology and some selected clinical aspects of the behavioural symptoms of dementia.

ADRESA ZA DOPISIVANJE / *CORRESPONDENCE*:

Steven G. Sclan

PsyKorr, Inc.Miami, USA & Berlin, Germany

E-mail: research@psykorr.com

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CILJ

Demencija je sindrom koji uključuje globalni deficit kognicije koji, između ostalog, uključuje funkciju sjećanja. Do smanjenja kognicije ne dolazi zbog delirija. Tri elementa obilježavaju kliničku sliku demencije: smanjenje kognicije, nedostatci u sposobnostima prilagodbe (tj. svakodnevnim životnim aktivnostima [ADL] i/ili instrumentalnim životnim aktivnostima [IADL]) te poremećaji u ponašanju. Pojam „demencija" obuhvaća Alzheimerovu bolest (AB; ~ 60 % slučajeva demencije), cerebrovaskularnu demenciju (CVD: ~ 5 % slučajeva), miješanu demenciju (MD; AB i CVD; ~ 10% slučajeva), demenciju Lewyjevih tjelešaca (DLT; ~ 15 % slučajeva), frontotemporalnu demenciju (FTD; ~ 5 % slučajeva) i drugo (~ 5 % slučajeva) (1-2). Zanimljivo je da unatoč smanjenoj kogniciji i uz to povezanim problemima (npr. poteškoće u sjećanju, poteškoće s integrativnim razmišljanjem i rješavanjem problema, itd.) te smanjenju ADL/IADL novija istraživanja pokazuju da su poremećaji u ponašanju glavni izvor stresa i/ili opterećenja za njegovatelje pacijenata (3-5). U slučaju AB-a, istaknuti odnos između poremećaja u ponašanju i stresa/tereta za njegovatelja (6-11) često je glavni okidač za hospitalizaciju pacijenata (4,7,12,13). Svrha je ovog rada ukratko se osvrnuti na fenomenologiju i određene odabrane kliničke aspekte ponašajnih simptoma demencije. S obzirom da AB i CVD imaju relativno sličan ponašajni profil (14,15) koji se djelomično razlikuje od FTD-a i DLT-a te s obzirom da su AB i CVD odgovorni za 80 % slučajeva demencije, ovaj će osvrt prikazati poremećaje u ponašanju tijekom trajanja AB-a. Na kraju će se rada ukratko izložiti glavne razlike između FTD-a i DLT-a.

KLINIČKI TIJEK ALZHEIMEROVE BOLESTI

Utjecaj ponašajnih simptoma na njegovatelja pacijenta s AB-om najbolje se može shvatiti proučavanjem razvoja simptoma tijekom napre-

AIM

Dementia is a syndrome that entails a global deficit in cognition including, but not limited to, memory function. This decline in cognition is not due to delirium. The clinical picture of dementia is characterized by 3 elements: decline in cognition, deficits in adaptive capacities (i.e., activities of daily living [ADL] and/or instrumental activities of daily living [IADL]) and behavioural disturbances. The term "dementia" is an "umbrella" whose province includes Alzheimer's Disease (AD: ~ 60% of dementias), cerebrovascular dementia (CVD; ~ 5% of cases), mixed dementia (MXD; AD & CVD; ~ 10% cases); Lewy Body dementia (DLB; ~ 15% of dementia); frontotemporal lobe dementia (FTD; ~ 5% of cases); other (~ 5% of cases) (1-2). Intriguingly, despite the cognitive decline and ensuing problems because of this (e.g., memory problems, problems in higher integrative thinking & problem solving, etc.) and, as well, decrements in ADL/IADL, recent research indicates that the behavioural disturbances are the major source of stress and/or burden for the caregiver of the patient (3-5). More specifically, for AD, the prominent relationship between behavioural disturbance and stress/burden of the caregiver (6-11) is quite often the major trigger for institutionalization of the patient (4,7,12,13). The purpose of this presentation is to briefly review the phenomenology and some selected clinical aspects of the behavioural symptoms of dementia. Since AD and CVD have a relatively similar behavioural profile (14,15) that differs slightly from that of both FTD and DLB and, since AD and CVD account for about 80% of cases of dementia, this review will be accomplished via a presentation of behavioural disturbances through the course of AD. A short section at the end of this discussion will present the salient characteristic differences of both FTD and DLB.

dovanja bolesti. Ljestvica globalnog pogoršanja (GDS; prema engl. *Global Deterioration Scale*) (16-21) globalno je mjerilo koje se koristi za procjenu smanjenja kognicije u normalnom starenju i AB-u (tablica 1). Temelji se na općem dojmu stanja pacijenta, a obuhvaća područja kognicije te funkcionalnih (IADL/ADL) i ponašajnih promjena. Ono što je najvažnije jest da GDS pruža mogućnost za detaljno pojašnjenje simptoma koji obilježavaju cijeli opseg oštećenja pamćenja – od normalnog starenja (GDS stadij 1) do najtežeg stadija AB-a (GDS stadij 7) (16-22).

Ključni je element GDS-a činjenica da je ta ljestvica redna (tj. stadiji su „rangirani" na način da stadij s većim brojem predstavlja veće oštećenje u odnosu na stadij koji mu prethodi) i hijerarhijska (tj. stadiji manjeg oštećenja integriraju i upravljaju adaptivnim funkcijama organizma). Kako pacijenti napreduju kroz stadije GDS-a vezane za kliničku dijagnozu AB-a, pokazuju znakove sve uočljivijeg i ozbiljnijeg oštećenja. Kako se pacijent kreće od „stadija manjeg oštećenja" do „stadija većeg oštećenja", dolazi do pogoršanja u težini kliničkih simptoma – uključujući potencijalno pojavljivanje ponašajnih i psiholoških poremećaja.

Često korištene ljestvice za procjenu ponašajnih problema u AB-u uključuju Neuropsihijatrijski inventar (23,24), Ljestvicu za procjenu ponašanja kod demencije konzorcija za uspostavu registra Alzheimerove bolesti (25), Ljestvicu poremećaja u ponašanju kod demencije (26) te druga

CLINICAL PROGRESSION ("COURSE") OF ALZHEIMER'S DISEASE

The impact of the behavioural symptoms upon the caregiver of the AD patient can be best appreciated by viewing the evolution of the symptoms as the disease progresses through time. The Global Deterioration Scale (GDS) (16-21) is a global measure designed for the assessment of cognitive decline in normal aging and AD (Table 1). It is based on a composite impression of the patient's status encompassing the areas of cognition, functional (IADL/ADL) and behavioural changes. Most significantly, the GDS allows for a detailed elucidation of symptoms characterizing the full range of memory impairment-from normal aging (GDS Stage 1) to the most severe stage of AD (GDS Stage 7) (16- 22).

A crucial element of the GDS is that it is both an ordinal (i.e. the stages are "ranked" in such a way that a higher numbered stage implies greater impairment than the stage immediately preceding it) and hierarchical (i.e. the less impaired stages integrate and govern the adaptive functions of the organism) scale. Thus, as patients advance through the GDS stages associated with the clinical diagnosis of AD they exhibit more and more observable and devastating impairment. Therefore, as the AD patient moves from a "less impaired stage" to a "more impaired stage" there is

TABLICA 1. Ljestvica globalnog pogoršanja (GDS) – AB-u pogoršanje prati predvidljivi klinički tijek*
TABLE 1. The Global Deterioration Scale (GDS) - Deterioration in AD Follows A Predictable Clinical Course*

GDS Stadij 1 = Normalo starenje / GDS Stage 1 = Normal Aging
GDS Stadij 2 = Subjektivno kognitivno oštećenje / GDS Stage 2 = Subjective Cognitive Impairment
GDS Stadij 3 = Početna faza AB-a (blago kognitivno oštećenje) / GDS Stage 3 = Incipient AD (Mild Cognitive Impairment)
GDS Stadij 4 = Blagi AB / GDS Stage 4 = Mild AD
GDS Stadij 5 = Umjeren AB / GDS Stage 5 = Moderate AD
GDS Stadij 6 = Umjereno težak AB / GDS Stage 6 = Moderately Severe AD
GDS Stadij 7 = Težak AB / GDS Stage 7 = Severe AD

*Bibliografija / *References
Reisberg B. *et al*. Amer J Psychiat 1982;139:1136-9.
Reisberg B. *et al*. The Global Deterioration Scale (GDS). Psychopharmacol Bull 1988;24:661-3.

pomagala namijenjena određenim tipovima ponašanja kao što su Cohen-Mansfieldov inventar agitacije (27) te Inventar apatije (28). No, navedene ljestvice nisu posebno osmišljene samo za AB ili su osmišljene za procjenu isključivo malog dijela spektra poremećaja u ponašanju kod AB-a. S druge strane, Ljestvica ponašajne patologije Alzheimerove bolesti (BEHAVE-AD; prema engl. *Behaviour Pathology in Alzheimer's Disease Rating Scale*) (29-31) posebno je osmišljena za procjenu ponašajnih poremećaja kod pacijenata s AB-om. Ono što je također važno jest da se njome može procijeniti ponašajne poremećaje kod pacijenata s AB-om tijekom cijelog tijeka bolesti – od 4. stadija GDS-a (na kojem je moguće postaviti kliničku dijagnozu AB-a) do konačnog stadija bolesti u kasnijem dijelu 7. stadija GDS-a (29-32). Ljestvica sadrži 25 čestica podijeljenih u 7 kategorija (tablica 2). Njegovatelj procjenjuje svaku od čestica prema težini simptoma koristeći ljestvicu s četiri moguća odgovora, od „0" (nije prisutno) do „3" (jako izraženo).

Već je utvrđeno da pacijenti ne postižu jednake rezultate na svih 25 čestica ljestvice BEHAVE-AD (31,33,34). To je posljedica vremenskih aspekata bolesti, kao i jedinstvene dinamične prirode neuroanatomskog/neurokemijskog pogoršanja u AB-u. No, učestalost pojave (33) nekih od najčešćih kategorija simptoma kao funkcije stadija GDS-a uključuje:

TABLICA 2. Ljestvica ponašajne patologije Alzheimerove bolesti (BEHAVE-AD)*
TABLE 2. Behavioural Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD)*

Kategorije ljestvice BEHAVE-AD / BEHAVE – AD Rating Categories
Paranoidne i sumanute misli / Paranoid & Delusional Ideation
Halucinacije / Hallucinations
Poremećaji aktivnosti / Activity Disturbances
Agresija / Aggression
Poremećaji dnevnog ritma / Diurnal Rhythm Disturbance
Afektivni poremećaji / Affective Disturbance
Anksioznosti i fobije / Anxieties & Phobias

*Bibliografija / *Reference
Reisberg B *et al.* J Clin Psychiatry 1987; 48(Suppl): 9-15.

an increase in severity of clinical symptoms – including the potential manifestation of aberrant behavioural and psychological disturbances.

Frequently used rating scales for the assessment of behavioural problems in AD include the Neuropsychiatric Inventory (23,24), the Behaviour Rating Scale for Dementia of the Consortium to Establish a Registry for Alzheimer's Disease (25), the Dementia Behaviour Disturbance Scale (26) and other instruments targeting specific behaviours such as the Cohen-Mansfield Agitation Inventory (27) and the Apathy Inventory (28). However, these scales were either not specifically designed solely for AD or were designed to evaluate only a small, specialized, portion of the spectrum of the behavioural disturbances in AD. Conversely, the Behaviour Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD) (29-31) was specifically designed to assess behavioural disturbance in AD patients. Additionally, and importantly, it too allows for the evaluation of behavioural disturbance in AD patients through the entire course of the illness – from GDS Stage 4 (where a clinical diagnosis of AD can be made) to the final stage of the illness in the latter half of GDS Stage 7 (29-32). The scale contains 25 items divided into 7 categories (Table 2). Each item is rated for severity of symptom by the caregiver along a 4-point scale ranging from "0" (not present) to "3" (severely manifest).

It has previously been cited that not all patients always score on all of the 25 items of the BEHAVE-AD (31,33,34). This is due to both the temporal aspects of the illness as well as the unique dynamic nature of the neuroanatomic/neurochemical deterioration of AD. However, the frequency of occurrence (33) of some of the commonly occurring symptom categories as a function of GDS Stage include:

1. **Paranoidne i sumanute misli** = vrhunac % na 5. stadiju GDS-a (npr. „ljudi kradu stvari“, „ovo nije moj dom“)
2. **Poremećaj aktivnosti** = vrhunac % na 6. stadiju GDS-a (npr. lutanje, vrpoljenje)
3. **Agresivnost** = vrhunac % na 6. stadiju GDS-a (npr. verbalni ispadi, fizički napad)
4. **Poremećaj sna** = vrhunac % na 5. stadiju GDS-a (npr. poremećaj dnevnog ritma)
5. **Anksioznosti** = vrhunac % na 5. stadiju GDS-a (npr. ponavljanje pitanja)

Bitno je upozoriti na nekoliko stvari. Kao prvo, s obzirom da pacijenti ne postižu jednake rezultate na svim česticama, valjana strategija analize utjecaja stresa/tereta ponašajnih simptoma na njegovatelja uključivala bi procjenu podataka na temelju postignutih rezultata po kategorijama (tj. prosječne „težine“ kategorija)/stadiju GDS-a umjesto na temelju samo učestalosti pojave/kategorija/stadija GDS-a. Kao drugo, pokazalo se da kod težih kroničnih bolesti (npr. raka) rezultati težine točnije odražavaju probleme kvalitete života i psihološki nemir od rezultata učestalosti (35). Rezultati našeg istraživanja (34) pokazuju niže prosječne ukupne rezultate ljestvice BEHAVE-AD za pacijente na 4. i 7. stadiju GDS-a te više rezultate za pacijente na 5. i 6. stadiju GDS-a (tj. veću težinu na 5. i 6. stadiju GDS-a). To ne začuđuje – pacijenti na 4. stadiju GDS-a nemaju ozbiljno pogoršanje, dok pacijenti na 7. stadiju GDS-a (vrlo teška Alzheimerova bolest) imaju ozbiljno pogoršanje na svim kognitivnim i funkcionalnim područjima. Pacijenti na 7. stadiju GDS-a često primaju njegu u staračkim domovima od stručnih njegovatelja umjesto od članova obitelji i/ili neformalnih njegovatelja koji imaju veću vjerojatnost da ih uznemire poremećaji u ponašanju.

DEMENCIJA LEWYJEVIH TJELEŠACA (DLT) I FRONTOTEMPORALNA DEMENCIJA (FTD)

Ponašajni poremećaji dio su simptomatske slike demencije Lewyjevih tjelešaca (DLT) i frontotemporalne demencije (FTD) (36,37).

1. **Paranoid & Delusional Ideation** = peak % at GDS Stage 5 (e.g. “people are stealing things”; “this is not my home”)
2. **Activity Disturbance** = peak % at GDS Stage 6 (e.g. wandering; fidgeting)
3. **Aggressiveness** = peak % at GDS Stage 6 (e.g. verbal outbursts; physical assaults)
4. **Sleep Disturbance** = peak % at GDS Stage 5 (e.g. diurnal rhythm disturbance)
5. **Anxieties** = peak % at GDS Stage 5 (e.g. repetitive questions)

Several caveats should be noted. Firstly, since not all patients score on all items, a reasonable strategy for analysis of the impact of stress/burden of the behavioural symptoms on the caregiver would be to evaluate the data in terms of the category scores (i.e. mean “severity” of category)/GDS Stage rather than just frequency of occurrence/category/GDS Stage. Secondly, it has been demonstrated that in more oppressive chronic illnesses (e.g. cancer) the severity scores more accurately reflect issues of quality of life and psychological distress than frequency scores (35). The results of our research (34) demonstrate lower mean total BEHAVE-AD scores for patients at GDS Stages 4 & 7 and higher scores for patients at GDS stages 5 & 6 (i.e. greater rating of severity at GDS stages 5 & 6). This is not surprising – patients at GDS stage 4 are not severely deteriorated while patients at GDS stage 7 (very severe AD) are, for the most part, severely compromised in just about all cognitive and functional spheres. Furthermore, patients at GDS stage 7 are frequently cared for within the context of a nursing home with professional care rather than family members and/or informal caregivers who are more likely to be disturbed by the aberrant behaviour.

LEWY BODY DEMENTIA (DLB) AND FRONTOTEMPORAL DEMENTIA (FTD)

Both Lewy Body Dementia (LBD) and Frontotemporal Dementia (FTD) display behavioural disturbances as part of their symptomatic pic-

No, njihovi se ponašajni profili međusobno razlikuju, a drugačiji su i od ponašajnog profila AB-a. Što se tiče DLT-a, primijećeno je da se kognitivni poremećaj mijenja, s ranim i donekle istaknutim pojavljivanjem vizualnih halucinacija i poremećajem sna (37). Pacijenti često imaju prolazne ali sustavne sumanute misli te imaju poteškoća sa složenim kognitivnim zadatcima (npr. rješavanje problema, izvršavanje više zadataka odjednom, itd.), dok se teškoće u pamćenju javljaju kasnije u tijeku bolesti (37). Također je primijećeno da demencija povezana s kasnijim stadijima Parkinsonove bolesti može na neki način biti povezana s DLT-om, s obzirom na sličnost njihovih profila (38). Profil FTD-a značajno se razlikuje od onog AB-a i DLT-a. Poremećaj počinje mnogo ranije u životu te se često dijagnosticira između 45. i 50. godine života (36). Iako halucinacije i sumanute misli nisu česte u FTD-u, ponašajni poremećaji su zamjetni: neprimjereni socijalni postupci, nedostatak socijalnog prosuđivanja, kompulzivna ponašanja koja se ponavljaju, prejedanje (pogotovo slatkišima), poteškoće u govoru (logika i sintaksa, ali ne i problemi s odabirom riječi) te nedostatak subjektivne svijesti o promjenama u razmišljanju i ponašanju (36,39). Ti se problemi pojavljuju vrlo rano u razvoju poremećaja te nastupaju prije očitih poteškoća s pamćenjem i razmišljanjem u demenciji (36,39).

ZAKLJUČAK

Iz gore navedenog opisa ponašajnih poremećaja u demenciji jasno je zašto oni njegovateljima pacijenata predstavljaju glavni izvor stresa i/ili tereta. Očito je da, primjerice, u kontekstu starijeg supružnika koji se kod kuće brine za pacijenta, takvi poremećaji mogu biti glavni poticaj za hospitalizaciju pacijenta. Kada je riječ o takvim problemima kod starijih ljudi, liječenje (a naročito psihofarmakološke intervencije) se mora provoditi s posebnim oprezom zbog velike vjerojatnosti za nepoželjne psihološke, neurološke i psihijatrijske nuspojave i komplikacije.

ture (36,37). However, their behavioural profiles differ from each other and, also, from that of AD. Regarding LBD, it has been observed that the cognitive disturbance fluctuates with an early and somewhat prominent appearance of visual hallucinations and sleep disorder (37). The patients will often exhibit transitory but systematized delusions and have difficulty with complex cognitive tasks (e.g. problem solving, multi-tasking, etc.) rather than a primary memory deficit which comes later in the disorder (37). It has also been noted that the dementia associated with the latter stages of Parkinson's Disease may be related, in some way, to LBD as the profiles are similar (38). The profile for FTD is quite different from that of both AD and LBD. The disorder starts much earlier in life and is frequently diagnosed at age 45-50 years (36). Although hallucinations and delusions are uncommon in FTD, the behavioural disturbances are striking: inappropriate social actions, lack of social judgement, repetitive compulsive behaviours, overeating (especially sweets), problems with speech (logic and syntax, not word finding difficulties), and a subjective unawareness of thinking and behavioural changes (36,39). These problems occur quite early in the evolution of the disorder and precede the obvious memory and cognitive deficits of the dementia (36, 39).

CONCLUSION

From the above descriptions of the behavioural disturbances of dementia it can be clearly understood why they are the major source of stress and/or burden for the caregiver of the patient. Furthermore, it is evident how such disturbance, in the context of an elderly spouse (for example) caring for a dementia patient at home, can serve as a primary stimulus for institutionalization of the patient. Treatment, especially psychopharmacological intervention, for these problems in the elderly must be handled with great care because of the high potential for adverse physiological, neurological and psychiatric side effects and complications.

LITERATURA/*REFERENCES*

1. Alzheimer's Research U.K. [Internet]. 2018. Different types of dementia. Available from: https://www.dementiastatistics.org/statistics/different-types-of-dementia/
2. Alzheimer's Association [Internet]. 2019. What is dementia? Available from: https://www.alz.org/alzheimers-dementia/what-is-dementia/types-of-dementia
3. Ory M, Hoffman RR, Yee YL, Tennstedt S, Schulz R. Prevalence and impact of caregiving: A detailed comparison between dementia and nondementia caregivers. Gerontologist 1999; 39(2): 177-85.
4. Thyrian JR, Eichler T, Hertel J, Wucherer D, Dreier A, Michalowsky B *et al*. Burden of behavioral and psychiatric symptoms in people screened positive for dementia in primary care: Results of the DelpHi study. J Alzheimers Dis 2015; 46(2): 451-9.
5. Terum TM, Andersen JR, Rongve A, Aarsland D, Svendsboe EJ, Testad I. The relationship of specific items on the Neuropsychiatric Inventory to caregiver burden in dementia: A systematic review. Int J Geriatr Psychiatry 2017; 32(7): 703-17.
6. Burns A. The burden of Alzheimer's Disease. Int J Geriatr Neuropsychopharmacol 2000; 3(7): 31-8.
7. Allegri R, Sarasola D, Serrano CM, Taragano FE, Arizaga RL, Butman J *et al*. Neuropsychiatric symptoms as a predictor of caregiver burden in Alzheimer's Disease. Neuropsychiatr Dis Treat 2006; 2(1): 105-10.
8. Aguera-Ortiz L, Frank-Garcia A, Gil P, Moreno A, 5E Study Group. Clinical progression of moderate-to-severe Alzheimer's Disease and caregiver burden: A 12-month multicenter prospective observational study. Int Psychogeriatr 2010; 22(8): 1265-79.
9. Bergvall N, Brinck P, Eek D, Gustavsson A, Wimo A, Winblad B *et al*. Relative importance of patient disease indicators on informal care and caregiver burden in Alzheimer's Disease. Int Psychogeriatr 2011; 23(1): 73-85.
10. Isik AT, Soysal P, Solmi M, Veronese N. Bidirectional relationship between caregiver burden and neuropsychiatric symptoms in patients with Alzheimer's Disease: A narrative review. International J Geriatr Psychiatry 2019; 34(9): 1326-34.
11. Reed C, Belger M, Scott Andrews J, Tockhorn-Heidenreich A, Jones RW *et al*. Factors associated with long-term impact on informal caregivers during Alzheimer's Disease dementia progression: 36-month results from GERAS. Int Psychogeriatr 2019; 1-11. doi: 10.1017/S1041610219000425
12. de Vugt ME, Stevens F, Aalten P, Lousberg R, Jaspers N, Verhey FR. A prospective study of the effects of behavioral symptoms on the institutionalization of patients with dementia. Int Psychogeriatr 2005; 17(4): 577-89.
13. Gaugler JE, Yu F, Krichbaum K, Wyman JF. Predictors of nursing home admission for persons with dementia. Med Care 2009; 47(2): 191-8.
14. Bathgate D, Snowden JS, Varma A, Blackshaw A, Neary D. Behaviour in frontotemporal dementia, Alzheimer's disease and vascular dementia. Acta Neurol Scand 2001; 103(6): 367-78.
15. Srikanth S, Nagaraja AV, Ratnavalli E. Neuropsychiatric symptoms in dementia-frequency, relationship to dementia severity and comparison in Alzheimer's Disease, vascular dementia and frontotemporal dementia. J Neurol Sci 2005; 236(1-2): 43-8.
16. Reisberg B, Ferris SH, de Leon MJ, Crook T. The Global Deterioration Scale for assessment of primary degenerative dementia. Am J Psychiatry 1982; 139(9): 1136-9.
17. Reisberg B. The Brief Cognitive Rating Scale and Global Deterioration Scale. In: Crook T, Ferris S, Bartus R (ed). Assessment in geriatric psychopharmacology. New Canaan: Mark Powley Assoc. Inc., 1983, pp 19-35.
18. Reisberg B. Dementia: A systematic approach to identifying reversible causes. Geriatrics 1986; 41(4): 30-46.
19. Reisberg B, Ferris SH, de Leon MJ, Crook T. Global Deterioration Scale (GDS). Psychopharmacol Bull 1988; 24(4): 661-3.
20. Reisberg B, Ferris SH, Kluger A, Franssen E, de Leon MJ, Mittelman M *et al*. Symptomatic changes in CNS aging and dementia of the Alzheimer type: Cross-sectional, temporal and remediable concomitants. In: Bergener M, Reisberg B (ed). Diagnosis and treatment of senile dementia. Berlin: Springer-Verlag, 1989, pp 193-223.
21. Reisberg B, Sclan SG, Franssen E, Kluger A, Ferris S. Dementia staging in chronic care populations. Alzheimer Dis Assoc-Disord 1994; 8(Suppl 1): S188-205.
22. Auer S, Sclan SG, Yaffee RA, Reisberg B. The neglected half of Alzheimer's Disease: Cognitive and functional concomitants of severe dementia. J Am Geriatr Soc 1994; 42(12): 1266-72.
23. Cummings JL, Mega M, Gray K, Rosenberg-Thompson S, Carusi DA, Gornbein J. The Neuropsychiatric Inventory: Comprehensive assessment of psychopathology in dementia. Neurology 1994; 44: 2308-14.
24. Cummings J. The Neuropsychiatric Inventory Questionnaire: Background and Administration [Internet]. Available from: https://www.alz.org/media/Documents/npiq-questionnaire.pdf
25. The Behavior Rating Scale for Dementia of the Consortium to Establish a Registry for Alzheimer's Disease. The Behavioral Pathology Committee of the Consortium to Establish a Registry for Alzheimer's Disease. Am J Psychiatry 1995; 152(9): 1349-57.
26. Baumgarten M, Becker R, Gauthier S. Validity and reliability of the behavior disturbance scale. J Amer Geriatr Soc 1990; 38(3): 221-6.
27. Cohen-Mansfield J. Instruction Manual for the Cohen-Mansfield Agitation Inventory (CMAI). Rockville, MD: The Research Institute of the Hebrew Home of Greater Washington; 1991. [Internet] Available from: https://www.alz.org/media/Documents/npiq-questionnaire.pdf
28. Robert PH, Clairet S, Benoit M, Kouthich A, Bertogliati C, Tible O *et al*. The apathy inventory: Assessment of apathy and awareness in Alzheimer's Disease, Parkinson's Disease and mild cognitive impairment. Int J Geriatr Psychiatry 2002; 17(12): 1099-105.

29. Reisberg B, Borrenstein J, Franssen E, Shulman E, Steinberg G, Ferris SH. Remediable behavioral symptomatology in Alzheimer's disease. Hosp Community Psychiatry 1986; 37: 1199-201.
30. Reisberg B, Borenstein J, Salob SP, Ferris SH, Franssen E, Georgotas A. Behavioral symptoms in Alzheimer's Disease: Phenomenology and treatment. J Clin Psychiatry 1987; 48(Suppl): 9-15.
31. Reisberg B, Monteiro I, Torossian C, Auer S, Shulman MB, Ghimire S *et al*. The BEHAVE-AD assessment system: A perspective, a commentary on new findings, and a historical review. Dement Geriatr Cogn Disord 2014; 38(1-2): 89-146.
32. Auer SR, Sclan SG, Yaffee RA, Reisberg B. The neglected half of Alzheimer disease: cognitive and functional concomitants of severe dementia. J Am Geriatr Soc 1994; 42: 1266-72.
33. Reisberg B, Franssen E, Sclan S, Kluger A, Ferris SH. Stage specific incidence of potentially remediable behavioral symptoms in aging and Alzheimer disease: a study of 120 patients using the BEHAVE-AD. Bull Clin Neurosci 1989; 54: 95-112.
34. Sclan SG, Saillon A, Franssen E, Hugonot-Diener L, Saillon A, Reisberg B. The Behavioral Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD): reliability and analysis of symptom category scores. Int J Geriatr Psychiatry 1996; 11: 819-30.
35. Salsman J, Schalet B, Andrykowski M, Cella D. The Impact of Events Scale: A comparison of frequency versus severity approaches to measuring cancer-specific distress. Psychooncology 2015; 24(12): 1738-45.
36. Srikanth S, Nagaraja AV, Ratnavalli E. Neuropsychiatric symptoms in dementia – frequency, relationship to dementia severity and comparison in Alzheimer's Disease, vascular dementia and frontotemporal dementia. J Neurol Sci 2005; 236(1-2): 43-8.
37. Engelborghs S, Maertens K, Nagels G, Vloeberghs E, Marien P, Symons A *et al*. Neuropsychiatric symptoms of dementia: Cross-sectional analysis from a prospective, longitudinal Belgian study. Int J Geriatr Psychiatry 2005; 20(11): 1028-37.
38. American Parkinson Disease Association. [Internet]. 2019. Lewy Bodies, Dementia, and Parkinson's – What Does it all Mean? Available from: https://www.apdaparkinson.org/article/understanding-parkinsons-disease-dementia-lewy-bodies/
39. Alzheimer's Association. [Internet]. 2019. Frontotemporal Dementia. Available from: https://www.alz.org/alzheimers-dementia/what-is-dementia/types-of-dementia/frontotemporal-dementia