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Behavioral and Psychological Symptoms of Dementia

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Definition

Behavioral and psychological symptoms of dementia (BPSD) refer to symptoms that frequently occur in patients with dementia, including disturbed perception, memory loss, difficulty concentrating, confused reasoning and judgment, mood changes, and mobility disability (Cerejeira et al. 2012). More than 90% of people who have dementia will experience BPSD as part of their illness, and all of those living with dementia will have at least one symptom of BPSD at a time (Anand et al. 2017).

Overview

Dementia affects almost 50 million people globally, with a new case of dementia diagnosed every 3 sec somewhere in the world (see Alzheimer's Disease International, https://www.alz.co.uk/). Dementia affects not only patients but also caregivers and the whole society. Dementia can even occur at younger ages, under the age of 65, so-called younger onset dementia. A better understanding of dementia is essential to challenge the existing myths and misconceptions.

Dementia is a chronic decline in mental processes that is enough to hinder the daily performance. Dementia decreases the quality of life both for dementia patients and their caregivers and increases the financial stress for dementia care (Moore et al. 2001). Combining non-pharmacological with pharmacological interventions is the preferred therapy for managing BPSD. However, the efficacy of current approaches is moderate. There is an urgent need to identify novel pharmacological targets and develop new non-pharmacological methods to improve the adverse effects associated with BPSD.

Key Research Findings

Dementia is an age-related disease that is primarily referred as an irreversible neurodegenerative disorder characterized by a chronic loss of memory and other cognitive abilities, which are serious enough to interfere with the performance of daily activities (Burns and Iliffe 2009; Wu et al. 2016). Behavioral and psychological symptoms

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of dementia (BPSD) is designated by the International Psychogeriatrics Association (Finkel et al. 1997) to describe a heterogeneous range of psychological reactions, psychiatric symptoms, and behaviors resulting from dementia of any etiology (Finkel and Burns 2000). This concept has its origins in clinical descriptions that date back to the time when Esquirol (1838) firstly described these symptoms and Alzheimer (1906) reported in his first written case.

BPSD comprise various symptoms, including visual hallucinations, delusions, depression, euphoria, agitation, aggression, abnormal vocalizations, wandering, overactivity, sleep disturbances, and apathy (Anand et al. 2017). Among these, the most clinically significant symptoms are depression, apathy, anxiety, and agitation (Cerejeira et al. 2012). Although prevalence and severity of BPSD are likely to vary according to the individual's level of cognitive function and stage of the disease (Cerejeira et al. 2012), there is a wide consensus that BPSD are present in virtually all demented patients during the illness independent of subtypes (Savva et al. 2009).

Moreover, according to DSM-IV, the core feature of BPSD consists of gradual onset of multiple cognitive deficits (involving memory and at least one additional cognitive domain) not occurring exclusively during delirium and representing a decline from a previous level of functioning. Specifically, dementia can be characterized by several subtypes, as a result of changes that happen in the brain and irrevocable loss of neuronal cells. The most prevalent form of dementia is Alzheimer's disease (AD), accounting for 60–80% of cases, whereas other major types are frontotemporal dementia (FTD), dementia with Lewy bodies (LBD), and vascular dementia (VaD) (Duong et al. 2017).

However, neuropsychiatric symptoms in subjects with dementia are heterogeneous and largely unpredictable, affecting the emotional experience, thinking content, perception, and motor behavior (Kales et al. 2014; Karantzoulis et al. 2011). The most frequent clinical syndrome of frontotemporal disorder, behavioral variant frontotemporal dementia (bvFTD), also involves personality decline and changes in judgment (Johnen and Bertoux 2019). For instance, the increased likeliness choosing immediate rewards was found in behavioral variant FTD, but not in Alzheimer's disease or healthy group, which means bvFTD patients were more impulsive than other participants (Chiong et al. 2015; Bertoux et al. 2015). Early bvFTD patients were prone to choose from the risky decks and presented diminished loss aversion, showing that they tended to be lured by the prospect of immediate reward but were less sensitive to the future consequences of their choices (Manes et al. 2011). Similarly, executive deficits are arguably the most frequent cognitive deficit observed in the LBD syndromes but showing more difficulties in perceptual decision-making and social functioning (Bodden et al. 2010; Dirnberger and Jahanshahi 2013; Djamshidian et al. 2014; McKeith et al. 2004).

Assessments

For assessment, the various contributing factors to the development of BPSD are taken into account, including the person's physical health, psychological health, personal history, environment, and the neurological damage which caused the dementing different process (see Pathway for the Assessment and Management of Behavioural and Psychological Symptoms of Dementia (BPSD) v1.01). BPSD-like symptoms were firstly described in the 1830s (Finkel 1996). But it was not until in 1987 that the first structured psychiatric rating scale for BPSD, the Behavioural Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD), was developed to evaluate the presence and severity of 25 behavior symptoms in 7 categories (paranoid and delusional ideation, hallucination, activity disturbances, aggressiveness, sleep disturbances, affective symptoms, and anxieties and phobias) (Reisberg et al. 1987).

Currently, one of the most widely used instruments to assess BPSD is the Neuropsychiatric Inventory (NPI). It covers most of the important disruptive behaviors, including delusions, hallucinations, agitation, depression, anxiety, apathy, irritability, euphoria, disinhibition, aberrant motor behavior, nighttime behavior disturbances, and eating behavior abnormalities (Cummings et al. 1994).

Treatments

Non-pharmacological interventions, especially the psychosocial interventions, are oriented for alleviating the BPSD, working as the first-line method, whereas pharmacological interventions are intended to cure or control the BPSD by using medicines. With the advantages of no adverse effect, non-pharmacological interventions for BPSD should always be tried before pharmacological interventions and implemented throughout the treatment.

Non-pharmacological Interventions

According to the mental processing orientation of the implements, non-pharmacological interventions have been classified into the following types (O'Neil et al. 2011): (1) cognitive/emotion-oriented interventions (reminiscence therapy, simulated presence therapy, validation therapy); (2) sensory stimulation interventions (acupuncture, aromatherapy, light therapy, massage/touch, music therapy, Snoezelen multisensory stimulation, transcutaneous electrical nerve stimulation); (3) behavior management techniques; and (4) other psychosocial interventions such as animal-assisted therapy and exercise.

Additionally, several approaches were recommended for caregiver interventions in behavioral management training with great efficiency. For example, the describe, investigate, create, and evaluate model (DICE) is an evidence-informed method centered on BPSD developed both for patients and caregivers (Kales et al. 2014). Treatment Routes for Exploring Agitation (TREA) can guide caregivers in identifying needs underlying agitation through collected data using systematic methodology (Cohen-Mansfield et al. 2012). Several types of research have also regarded Tailored Activity Programs (TAP) and Dementia Care Mapping (DCM) as promising methods for alleviating BPSD in multiple settings (Gitlin et al. 2009; O'Connor et al. 2017; Surr et al. 2018).

Pharmacological Interventions

A variety of pharmacological treatments have been used to treat BPSD, depending on the target symptom and the particular type of medication, including typical and atypical antipsychotics, antidepressants, cholinesterase inhibitors, anticonvulsant mood stabilizers, benzodiazepines, and memantine.

The use of antipsychotics, particularly since the introduction of atypical antipsychotics, has increased over time (Briesacher et al. 2005). They have shown efficacy in treating specific symptoms, such as aggression, psychosis, and agitation (Ballard et al. 2008; Gauthier et al. 2010). However, atypical antipsychotics were reported to be associated with an increased risk of many adverse events including somnolence, extrapyramidal symptoms, cerebrovascular adverse events, urinary tract infections, edema, gait abnormality, and death compared to a placebo (Ma et al. 2014). The use of an antipsychotic for severe symptoms such as agitation, aggression, and psychotic symptoms should be time-limited, and a careful individual evaluation is recommended due to increased risk of stroke and mortality (Gill et al. 2007).

Cholinesterase inhibition is the only strategy that has thus far proven to have beneficial effects in enhancing cholinergic function and cognition in patients with Alzheimer's disease, working as cognitive enhancers (Press and Alexander 2013). Previous studies found improvements in some patients using anticonvulsant mood stabilizers in the treatment of BPSD (Konovalov et al. 2008), while some researches demonstrated that anticonvulsants appear to have no promising beneficial effects (Tampi et al. 2017). Numerous studies clarify that antidepressant medications can be an effective alternative in the treatment of BPSD in dementia individuals, with good efficacy and tolerability (Henry et al. 2011).

It has been demonstrated that memantine preferentially improves Alzheimer's disease brain neuropathology, as well as prevents Alzheimer's disease production, aggregation, or downstream neurotoxic consequences by preventing the excessive continuous extra-synaptic NMDAR disease activation, therefore hindering neuronal cell death (Taipale et al. 2018). The recent evidence from meta-analysis revealed that particular benzodiazepines with careful selections still might be the drug of choice for treating insomnia in elderly

patients, despite several studies have found the use of benzodiazepines could increase the risk of dementia (He et al. 2019).

Future Directions of Research

Although demented disorders are biologically and clinically distinct from each other, there are many similarities between them, which means non-timely diagnosis and misdiagnosis are common problems. Hence, many patients would receive an uncertain or ambiguous diagnosis. Extensive efforts need to be made in developing better diagnoses for different subtypes of dementia and identifying new and effective therapeutic methods to cure them. In addition, future studies are also needed to explore long-term trends in the incidence and prevalence of dementia in order to optimize treatments and psychosocial care according to the epidemiologic transition.

Dementia is a multifactorial and heterogeneous disorder that is driven by a constellation of genetic and environmental risk and protective factors. Key neuropathological hallmarks of AD are extracellular amyloid plaques and intracellular accumulation of hyperphosphorylated tau protein. The APOE gene has been shown to be the strongest common genetic risk factor for dementia (van der Lee et al. 2018). Candidate-gene-based association studies have also identified other common genetic variants that are related to on the onset of Alzheimer's disease and dementia (van der Lee et al. 2018; Mishra et al. 2017; Van Mossevelde et al. 2018). Identifying genetic liability for specific subtypes of dementia may promote personalized interventions that utilize genetic information.

Accumulating evidence suggests that dementia is related to several common modifiable risk factors, including diabetes mellitus, midlife hypertension, midlife obesity, physical inactivity, depression, smoking, and low education. Given that there is currently no cure and no treatment to stop the progression, prevention and early intervention to delay onset of symptoms play a pivotal role in combating dementia. Several randomized controlled trials (RCTs), e.g., FINGER, MAPT, and PreDIVA have shown that multidomain lifestyle intervention targeting of preventive interventions to at-risk individuals is an effective strategy to prevent cognitive decline (Kivipelto et al. 2018). Future studies should conduct RCTs to test interventions that either modify risk or reduce the development of early disease holds the promise to delay the onset of dementia.

Summary

BPSD are commonly encountered in long-term care settings and often lead to the need for assisted living and nursing. The Neuropsychiatric Inventory (NPI) is the most commonly used instrument to assess BPSD. It is recommended that people with mild to moderate BPSD should be managed without the use of pharmacological treatments which may have serious side effects and the known risks of adverse events. However, if non-pharmacologic approaches are insufficient or fail, medications to treat BPSD should be considered. Due to the adverse effects along with the BPSD, the need to develop appropriate approaches to assess the level of the dementia is urgent, and more effective behavioral interventions should be used to address BPSD.

Cross-References

- ▶ Behavioral Interventions in Dementia
- ▶ Cognitive Disorders
- ▶ Dementia as Cultural Metaphor
- ▶ Dementia Narratives
- ▶ Dementia
- ▶ Mild Cognitive Impairment
- ▶ Prevention of Age-Related Cognitive Impairment
- ▶ Alzheimer's Disease and Dementia
- ▶ Vascular Dementia

References

Alzheimer A (1906) Uber einen eigenartigen schweren Er Krankungsprozeb der Hirnrinde. Neurologisches Centralblatt 23:1129–1136

Anand A, Khurana P, Chawla J, Sharma N, Khurana N (2017) Emerging treatments for the behavioral and psychological symptoms of dementia. CNS Spectr 1–9. https://doi.org/10.1017/S1092852917000530

Ballard C, Day S, Sharp S, Wing G, Sorensen S (2008) Neuropsychiatric symptoms in dementia: importance and treatment considerations. Int Rev Psychiatry 20(4):396–404. https://doi.org/10.1080/09540260802099968

Bertoux M, de Souza LC, Zamith P, Dubois B, Bourgeois-Gironde S (2015) Discounting of future rewards in behavioural variant frontotemporal dementia and Alzheimer's disease. Neuropsychology 29(6):933. https://doi.org/10.1037/neu0000197

Bodden ME, Dodel R, Kalbe E (2010) Theory of mind in Parkinson's disease and related basal ganglia disorders: a systematic review. Mov Disord 25(1):13–27. https://doi.org/10.1002/mds.22818

Briesacher BA, Limcangco MR, Simoni-Wastila L, Doshi JA, Levens SR, Shea DG, Stuart B (2005) The quality of antipsychotic drug prescribing in nursing homes. Arch Intern Med 165(11):1280–1285. https://doi.org/10.1001/archinte.165.11.1280

Burns A, Iliffe S (2009) Clinical review: dementia. Br Med J 338:b75

Cerejeira J, Lagarto L, Mukaetova-Ladinska E (2012) Behavioral and psychological symptoms of dementia. Front Neurol 3:73. https://doi.org/10.3389/fneur.2012.00073

Chiong W, Wood KA, Beagle AJ, Hsu M, Kayser AS, Miller BL, Kramer JH (2015) Neuroeconomic dissociation of semantic dementia and behavioural variant frontotemporal dementia. Brain 139(2):578–587. https://doi.org/10.1093/brain/awv344

Cohen-Mansfield J, Thein K, Marx MS, Dakheel-Ali M, Freedman L (2012) Efficacy of nonpharmacologic interventions for agitation in advanced dementia: a randomized, placebo-controlled trial. J Clin Psychiatry 73(9):1255–1261. https://doi.org/10.4088/JCP.12m07918

Cummings JL, Mega M, Gray K, Rosenberg-Thompson S, Carusi DA, Gornbein J (1994) The neuropsychiatric inventory: comprehensive assessment of psychopathology in dementia. Neurology 44(12):2308–2308. https://doi.org/10.1212/WNL.44.12.2308

Dirnberger G, Jahanshahi M (2013) Executive dysfunction in Parkinson's disease: a review. J Neuropsychol 7(2):193–224. https://doi.org/10.1111/jnp.12028

Djamshidian A, O'Sullivan SS, Lawrence AD, Foltynie T, Aviles-Olmos I, Magdalinou N, Tomassini A, Warner TT, Lees AJ, Averbeck BB (2014) Perceptual decision-making in patients with Parkinson's disease. J Psychopharmacol 28(12):1149–1154. https://doi.org/10.1177/0269881114548437

Duong S, Patel T, Chang F (2017) Dementia: what pharmacists need to know. Can Pharm J/Rev Pharm Canada 150(2):118–129. https://doi.org/10.1177/1715163517690745

Esquirol E (1838) Des maladies mentales, 2 vols. JB Baillière, Paris

Finkel SI (1996) Research methodologic issues in evaluating behavioral disturbances of dementia. Int Psychogeriatr 8(S2):149–150. https://doi.org/10.1017/S104161029700330X

Finkel SI, Burns A (2000) Behavioral and psychological symptoms of dementia (BPSD): a clinical and research update-introduction. Int Psychogeriatr 12(1):9–12

Finkel SI, e Silva JC, Cohen G, Miller S, Sartorius N (1997) Behavioral and psychological signs and symptoms of dementia: a consensus statement on current knowledge and implications for research and treatment. Int Psychogeriatr 8(S3):497–500. https://doi.org/10.1017/S1041610297003943

Gauthier S, Cummings J, Ballard C, Brodaty H, Grossberg G, Robert P, Lyketsos C (2010) Management of behavioral problems in Alzheimer's disease. Int Psychogeriatr 22(3):346–372. https://doi.org/10.1017/S1041610209991505

Gill SS, Bronskill SE, Normand S-LT, Anderson GM, Sykora K, Lam K, Bell CM, Lee PE, Fischer HD, Herrmann N (2007) Antipsychotic drug use and mortality in older adults with dementia. Ann Intern Med 146(11):775–786. https://doi.org/10.7326/0003-4819-146-11-200706050-00006

Gitlin LN, Laraine W, Tracey VE, Herge E, Adel CNL, Piersol CV, Burke JP (2009) The tailored activity program to reduce behavioral symptoms in individuals with dementia: feasibility, acceptability, and replication potential. Gerontologist 49(3):428–439. https://doi.org/10.1093/geront/gnp087

He Q, Chen X, Wu T, Li L, Fei X (2019) Risk of dementia in long-term benzodiazepine users: evidence from a meta-analysis of observational studies. J Clin Neurol 15(1):9–19. https://doi.org/10.3988/jcn.2019.15.1.9

Henry G, Williamson D, Tampi RR (2011) Efficacy and tolerability of antidepressants in the treatment of behavioral and psychological symptoms of dementia, a literature review of evidence. Am J Alzheimers Dis Other Dement 26(3):169–183. https://doi.org/10.1177/1533317511402051

Johnen A, Bertoux M (2019) Psychological and cognitive markers of behavioral variant frontotemporal dementia–a clinical neuropsychologist's view on diagnostic criteria and beyond. Front Neurol 10. https://doi.org/10.3389/fneur.2019.00594

Kales HC, Gitlin LN, Lyketsos CG, Assessment DEPot, Dementia MotNSo (2014) Management of neuropsychiatric symptoms of dementia in clinical settings: recommendations from a multidisciplinary expert panel. J Am Geriatr Soc 62(4):762–769. https://doi.org/10.1111/jgs.12730

Karantzoulis S, Galvin JE, Braak S, Mckhann MK, Jack S, Hodges B (2011) Distinguishing Alzheimer's disease from other major forms of dementia. Expert Rev Neurother 11(11):1579–1591. https://doi.org/10.1586/ern.11.155

Kivipelto M, Mangialasche F, Ngandu T (2018) Lifestyle interventions to prevent cognitive impairment, dementia and Alzheimer disease. Nat Rev Neurol 14(11):653–666. https://doi.org/10.1038/s41582-018-0070-3

Konovalov S, Muralee S, Tampi RR (2008) Anticonvulsants for the treatment of behavioral and psychological symptoms of dementia: a literature review. Int Psychogeriatr 20(2):293–308. https://doi.org/10.1017/S1041610207006540

Ma H, Huang Y, Cong Z, Wang Y, Jiang W, Gao S, Zhu G (2014) The efficacy and safety of atypical antipsychotics for the treatment of dementia: a meta-analysis of randomized placebo-controlled trials. J Alzheimers Dis 42(3):915–937. https://doi.org/10.3233/JAD-140579

Manes F, Torralva T, Ibáñez A, Roca M, Bekinschtein T, Gleichgerrcht E (2011) Decision-making in frontotemporal dementia: clinical, theoretical and legal implications. Dement Geriatr Cogn Disord 32(1):11–17. https://doi.org/10.1159/000329912

McKeith I, Mintzer J, Aarsland D, Burn D, Chiu H, Cohen-Mansfield J, Dickson D, Dubois B, Duda JE, Feldman H (2004) Dementia with Lewy bodies. Lancet Neurol 3(1):19–28

Mishra A, Ferrari R, Heutink P, Hardy J, Pijnenburg Y, Posthuma D, Consortium IF-G (2017) Gene-based association studies report genetic links for clinical subtypes of frontotemporal dementia. Brain 140(5):1437–1446. https://doi.org/10.1093/brain/awx066

Moore S, Sandman CA, McGrady K, Patrick Kesslak J (2001) Memory training improves cognitive ability in patients with dementia. Neuropsychol Rehabil 11(3-4):245–261. https://doi.org/10.1080/0960201004 2000222

O'Connor CM, Clemson L, Brodaty H, Low LF, Jeon YH, Gitlin LN, Piguet O, Mioshi E (2017) The tailored activity program (TAP) to address behavioral disturbances in frontotemporal dementia: a feasibility and pilot study. Disabil Rehabil 41(3):299–310. https://doi.org/10.1080/09638288.2017

O'Neil ME, Freeman M, Christensen V, Telerant R, Addleman A, Kansagara D (2011) A systematic evidence review of non-pharmacological interventions for behavioral symptoms of dementia. Department of Veterans Affairs, Washington, DC

Press D, Alexander M (2013) Cholinesterase inhibitors in the treatment of dementia. UpToDate Waltham (MA): UpToDate. http://www.uptodate.com/contents/cholinesterase-inhibitors-in-the-treatment-of-dementia

Reisberg B, Borenstein J, Salob SP, Ferris SH (1987) Behavioral symptoms in Alzheimer's disease: phenomenology and treatment. J Clin Psychiatry 48 (Suppl):9–15

Savva GM, Zaccai J, Matthews FE, Davidson JE, McKeith I, Brayne C (2009) Prevalence, correlates and course of behavioural and psychological symptoms of dementia in the population. Br J Psychiatry 194(3):212–219. https://doi.org/10.1192/bjp.bp.108.049619

Surr CA, Griffiths AW, Kelley R (2018) Implementing dementia care mapping as a practice development tool in dementia care services: a systematic review. Clin Interv Aging 13:165–177. https://doi.org/10.2147/CIA.S138836

Taipale H, Gomm W, Broich K, Maier W, Tolppanen AM, Tanskanen A, Tiihonen J, Hartikainen S, Haenisch B (2018) Use of antiepileptic drugs and dementia risk – an analysis of Finnish health register and German health insurance data. J Am Geriatr Soc 66(6):1123–1129. https://doi.org/10.1111/jgs.15358

Tampi RR, Tampi DJ, Balachandran S (2017) Antipsychotics, antidepressants, anticonvulsants, melatonin, and benzodiazepines for behavioral and psychological symptoms of dementia: a systematic review of meta-analyses. Curr Treat Options Psychiatry 4(1):55–79. https://doi.org/10.1016/j.jagp.2018.01.113

van der Lee SJ, Wolters FJ, Ikram MK, Hofman A, Ikram MA, Amin N, van Duijn CM (2018) The effect of APOE and other common genetic variants on the onset of Alzheimer's disease and dementia: a community-based cohort study. Lancet Neurol 17(5):434–444. https://doi.org/10.1016/S1474-4422(18)30053-X

Van Mossevelde S, Engelborghs S, van der Zee J, Van Broeckhoven C (2018) Genotype–phenotype links in frontotemporal lobar degeneration. Nat Rev Neurol 14(6):363–378. https://doi.org/10.1038/s41582-018-0009-8

Wu Y-T, Fratiglioni L, Matthews FE, Lobo A, Breteler MM, Skoog I, Brayne C (2016) Dementia in western Europe: epidemiological evidence and implications for policy making. Lancet Neurol 15(1):116–124. https://doi.org/10.1016/S1474-4422(15)00092-7