Rehabilitation in Dementia

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ABSTRACT

Dementia is an eurodegenerative disorder, which causes significant disability, especially among the elderly population worldwide. The affected person shows a progressive cognitive decline, which interferes with the independence in performing the activities of daily living. Other than the cognitive domain, the patient tends to have neuropsychiatric, behavioral, sensorimotor, speech, and language-related issues. It is expected that the global burden of the disease will rise with more people entering the geriatric age group. By 2050 close, to 140 million people will be living with one or the other type of dementia. Alzheimer's disease contributes to more than 60% of cases worldwide, followed by vascular dementia.

Pharmacotherapy has a limited role to play in the treatment, and at present, no drug is available, which can halt or reverse the progress of the disease. World Health Organization has mandated rehabilitation as a core recommendation in the global action plan on the public health response to dementia. Rehabilitation services are widely recognized as a practical framework to maximize independence and community participation in dementia care. The rehabilitation program is customized to achieve the desired goals, as each person has different experiences, preferences, motivations, strengths, and requirements based on type, course, and severity of the illness. It is an interdisciplinary-team approach with the involvement of several health care professionals. This article reviews the existing literature and outlines the effective rehabilitation strategies concisely in dementia care.

Keywords: Dementia, geriatric psychiatry, rehabilitation, review

Dementia is a global public health concern and a significant cause of disability among the elderly population worldwide.[1] It is a neurodegenerative disorder characterized by a significant cognitive decline that interferes with independence in activities of daily living (ADL).[2] In 2015, about 46 million people lived with dementia globally, and this number is expected to triple by 2050, with two-third population residing in low or middle-income countries.[3] In India, the prevalence of dementia is about 2.7% among people aged above 60 years.[4–7] The increasing disease burden globally will command a mammoth socioeconomic hardship in countries worldwide with far more complicating circumstances in low-income countries.[6,8]

Alzheimer's disease (AD) contributes to 60% of the cases of dementia followed by vascular dementia.[9] Frontotemporal dementia (FTD) is almost equivalent to AD among patients younger than 65 years age group.[10] Parkinson's disease (PD) dementia and dementia with Lewy bodies (DLW) are the other rare causes of dementia.[11,12]

AD most frequently presents with early impairment in episodic memory, with deficits in other cognitive domains, such as semantic memory, language, executive function, and visuospatial abilities.[13] In vascular dementia, executive functioning, attention, and perception are more affected than episodic memory.[14,15] Parkinsonian dementias are distinguished by impairment in attention and executive function.[16] Among the FTDs, the behavioral variant presents with early changes in behavior, personality, and executive dysfunction, while the semantic variant is characterized by naming deficits and loss of conceptual knowledge.[17,18]

A comprehensive rehabilitation program plays a major role in pharmacotherapy in the management of people living with dementia. Hence, it is necessary to have proper guidelines for the rehabilitation of these patients. This article reviews the existing literature related to management strategies and outlines the effective multidisciplinary rehabilitation program concisely in dementia care.

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A Comprehensive Approach to Rehabilitation in Dementia

World Health Organization mandated rehabilitation as a core recommendation in the global action plan on the public health response to dementia. Rehabilitation services are widely recognized as a practical framework to maximize independence and community participation in dementia care.[19,20] A rehabilitation program is customized to achieve the desired goals, acknowledging that each person with dementia has a unique experience, preference, motivation, strength, and requirement.[19] It is an interdisciplinary-team approach with the involvement of several health care professionals. The clinician heading the team could be a neurologist/psychiatrist. In a rehabilitation department, it is headed by a physiatrist/rehabilitation physician. Other members comprise psychologists, physiotherapists, orthotist, occupational therapists, speech and language therapists, social workers, etc.

Clinical Assessment and Relevant Pharmacotherapy

People with dementia have symptoms in many domains, including cognition, neuropsychiatric symptoms, behavior, and ADL, in addition to comorbid illnesses. The rehabilitation team has to consider a person's needs in a holistic way to address medical, cognitive, behavioral, physical, and social issues.[21] Thus, a comprehensive clinical assessment is required to design a customized program.

More often than not, dementia is associated with comorbid medical illnesses, which may be confused for the symptoms of dementia. Timely identification and management of the comorbidities are crucial for better functioning and the global well-being of the individual.[22] Common comorbidities that are likely to require medical attention are diabetes, hypertension, heart failure, anemia, cardiac arrhythmia, pressure ulcers, osteoporosis, and thyroid disease.[23] Unnecessary exposure to sedative-hypnotics and anticholinergic medications hurt cognition among older people.[24,25] Hence, medication review is invariably appropriate to minimize polypharmacy.

Sensory-Motor Rehabilitation

Gait Disorders

Gait deviation, balance, and motor impairments are common in people with dementia and are associated with an increased risk of falls.[26–28] There are diverse patterns of gait deviations reported across subtypes of dementia, and in general, they are more prominent in Lewy Body Dementia (LBD) and PD as compared to AD.[27,29] But some studies have reported gait dysfunction in the early stage of AD.[30,31] The gait and motor impairment patterns vary with the disease severity and may include gait apraxia, bradykinesia, extrapyramidal rigidity, resting tremor, and various other gait disorders.[27,31–33] The most prevalent impairment reported is a cautious gait in mild AD, which is nonspecific and could be related to other conditions such as arthritis, peripheral sensory, and motor neuropathy. Frontal gait disorder, characterized by striking disequilibrium, short steps, shuffling, and hesitation, may be observed in moderate and severe AD.[34] Poor cognition in these patients is associated with slower walking speed.[35] Simultaneous cognitive task (dual tasking) also leads to gait dysfunction in early dementia. Temporal disturbances (slower speed), spatial disturbances (variable step length and step width), and instability in single stance (balance impairment) are the different gait dysfunctional patterns, which have been reported during dual-tasking.[36]

Gait Rehabilitation

Gait training focusing on the ADL such as sit to stand from a chair, kneeling, walking, turning are useful in improving mobility and are considered better than resistance and flexibility exercises. Concomitant cognitive intervention along with walking may aid in improving gait.[37] As the individual shows improvement, the challenge of the task can be increased to better the gait speed and coordination of walking.[38] Other strategies like rhythmic music have been reported to show improvement in the walking speed in individuals with AD.[39]

Falls

Evidence suggests that older adults with AD, even at an early stage, are at greater risk of falls than their age-matched peers without dementia.[26,35,40] The increased risk can be explained by the interaction of various risk factors such as physiological changes (visual impairment, osteoporosis), autonomic symptoms, physical inactivity, sensory neuropathy (associated with diabetes), orthostatic hypotension, and polypharmacy. Postural control is mediated by integrating sensory, motor, visual, cognitive, and vestibular networks. Any disruption in the circuit can lead to postural instability, a major factor in falls in people with dementia.[41,42] Community-dwelling people with dementia are at higher risk of hip fracture secondary to a fall.[43]

Fall Prevention Strategies

Exercise intervention focusing on improving gait, balance, and strength effectively reduces fall and fall-related fractures in the older population.[44] An exercise program of mild to moderate intensity, practiced twice a week and focusing on balance, will help in preventing falls.[45] Fall prevention strategies need to be individually tailored considering the felt need of the patients and their caregivers and should include home safety modifications.[46] There is limited evidence regarding the effectiveness of conventional strategies in people living with dementia across hospital setup, residential care, and community.[47,48] A recent Cochrane review showed insufficient evidence for effective rehabilitation following hip fracture in people living with dementia.[49]

Physical Exercise and Lifestyle

Regular physical exercise is recommended to all older adults, as it may improve physical health, reduce frailty, decrease the risk of depression, and improve cognitive function.[50,51] A minimum of 150 minutes of moderate exercise is recommended every week for health benefits.[52] However, 30 minutes of physical exercise three times a week may improve cognition in people with dementia.[53]

Regular physical activity may lessen the risk of AD and slow the onset or progression.[53–55] A prospective study on women observed that physical and cognitive exercises at midlife reduce the risk

of AD and dementia occurring later in life.[56] Physical activity of moderate intensity may be associated with a reduced risk of developing dementia in people with mild cognitive impairment.[57]

A recent multicentric study in the UK (DAPA Trial) did not show any positive effect of moderate to high-intensity exercise on cognition.[58] A Cochrane review endorsed the positive effect of exercise programs in preserving independence in ADL in persons with dementia but showed poor evidence of benefit on cognition and neuropsychiatric symptoms.[59] Still, this finding is of some significance because maintaining functional independence is crucial for enhancing the quality of life of persons with dementia and their caregivers and for preventing hospitalization.

There is wide heterogeneity in the individual response to physical exercise, especially in strength and endurance programs.[60] Genetic factors and diet and exercise regime (volume, duration, frequency, type of exercise) may contribute to exercise insensitivity in some of these persons with dementia.[61]

High-volume physical exercise may help to overcome the lack of training effect.[62] However, the effective dose of exercise and its response to cognition is still not well understood. Brain-derived neurotrophic factor (BDNF) is a potential mediator of exercise-induced neuronal plasticity that may improve cognition.[63–65] The exercise interventions should be exhaustive enough to build lactate levels. Higher lactate concentrations are correlated with raised BDNF levels.[66,67] High-Intensity Interval Training (HIIT) could be a method to gain larger BDNF levels. There is increasing evidence about the beneficial effects of HIIT training for older populations with chronic diseases such as chronic heart failure and chronic obstructive pulmonary disease.[68] Majority of exercise programs studied in dementia incorporated moderate to high-intensity exercise, not HIIT.[57,58] Though further research is awaited, HIIT can be a worthwhile exercise regime for preventing cognitive decline in persons with dementia.[69]

The exercise regime investigated in dementia care includes various training programs such as aerobic exercise, resistance training, balance, and flexibility training. Further studies are required to determine the minimum duration, type, and intensity of exercise required to improve cognitive function in dementia. A personalized exercise program should be prescribed depending on performance analysis and modifiable individual factors.[70]

Some of the large randomized controlled trials (MAPT, PreDIVA, and FINGER) looked at the effect of multidomain lifestyle interventions on cognitive functions and prevention of dementia.[71–73] Beneficial effects of diet and physical exercise on cognitive functions among people at risk of dementia have been reported in the FINGER trial.[73]

Cognition

Dementia is characterized by a significant cognitive decline in one or more cognitive domains leading to the inability to perform everyday activities and participate in social life. As a result, cognitive impairments have a tremendous impact on patients' quality of life and their caregivers.

Cognitive rehabilitation (CR) is a common nonpharmacological approach to address cognitive issues in people living with dementia. There are three main strategies proposed for intervention. These include, cognitive stimulation (CS), cognitive training (CT), and CR.[74]

Cognitive Stimulation

CS is a nonspecific approach to stimulate all cognitive domains. A wide range of activities such as reminiscence therapy, reality orientation, and sensorimotor therapy has been tried in individual and group formats and have shown social functioning and global cognition benefits. CS has the most reliable evidence among cognitive interventions. Several studies have described a positive effect of CS on the enhancement of overall cognitive functioning in mild-to-moderate dementia.[75–77] A current systematic review revealed the beneficial effect of CS on the Mini-Mental State Examination.[78]

Cognitive Training

CT conventionally involves the repeated practice of a set of structured tasks intended to improve or maintain a particular cognitive function. The central theory underlying CT is that repeated training can enhance or maintain a concerned cognitive function. The practice also helps to perform better in a related but different task based on the same cognitive ability. CT may be delivered individually or in a group session. Computerized CT has largely replaced the conventional "paper and pencil" format. In CT, the target task is divided into small elements to improve underlying cognitive processes, and repeated performance leads to neuroplasticity in the brain.[79–81]

CT has shown promising results in older adults and people with minimal cognitive impairment with level C evidence.[82–85] In contrast, the evidence of CT in patients with moderate and severe dementia is poor with questionable effects on global cognition and verbal semantic fluency.[81,83,86]

Cognitive Rehabilitation

CR is a person-centered intervention that addresses the impact of cognitive dysfunction on everyday activities and enables the person to execute the desired action.[87] In CR, rehabilitation therapist engages both patient and caregivers to determine realistic goals associated with day-to-day activities based on a person's functioning and cognitive demand of the desired goal. CR guides the person with dementia to achieve the desired goal using evidence-based rehabilitation techniques. These techniques may comprise environmental modifications, compensatory strategies, memory aids, and procedural learning of skills. A rehabilitation plan is put into practice in the home setting to make realistic situations.[87,88] A multicentric randomized trial (The GRAET trial) confirms positive evidence of an individualized CR to improve daily life in people with early-stage dementia.[89]

Behavioral and Psychological Symptoms of Dementia

In addition to cognitive decline, people with dementia suffer from several neuropsychiatric symptoms, collectively called behavioral and psychological symptoms of dementia (BPSDs). It includes disorder of perception (delusion, hallucination), aberrant motor behavior (wandering,

repetitive movements, aggression), emotional issues (apathy, depression, anxiety, irritability, euphoria, disinhibition), and vegetative symptoms (sleep or appetite changes).[90,91] Majority of people with dementia experience BPSD in the community as well as in in-hospital setup. The most common neuropsychiatric symptoms in community-dwelling patients are delusions, agitation, motor hyperactivity, and apathy. In contrast, aggression, irritability, night-time restlessness, unusual motor behavior, and disinhibition are frequently reported in hospitalized patients.[91,92] In the Indian population, the highest prevalence of BPSD is in FTD, followed by DLB, and the least in vascular dementia.[93] It is important to evaluate BPSD at an early stage to avoid rapid progression in AD.[94]

The etiology of BPSD is multifactorial. It is probably the effect of a complex interaction of psychological, social, and biological factors. Neuroimaging shows reduced metabolism and volume reduction in the prefrontal cortex, anterior cingulate, and temporal lobe, associated with certain BPSD symptoms like apathy and psychosis.[95] The determinants of BPSD include various factors such as premorbid personality, genetics, coexisting medical conditions, drugs, and unmet physical needs. Environmental factors such as crowding, noise, isolation, inadequate temperature, change of schedule, as well as the inappropriate interaction between patient and caregiver or the inadequacy of the patient to communicate his requirements, may all precipitate BPSD.[96]

Management of BPSD

A thorough history and physical examination of the patient and caregivers is necessary to come to an individualized treatment plan. Acute or subacute onset of symptoms should be promptly investigated (e.g. infection, dyselectrolytemia, substance intoxication) to rule out causes of delirium, which usually need hospitalization. Assessing the severity of symptoms is the priority, especially for patients who are endangering the life of themselves or others who will need aggressive management.[97] More than half of the persons with dementia suffer from daily pain, which may precipitate depression, agitation, and aggression.[98]

Since neuropsychiatric symptoms can fluctuate and their assessment is subjective, establishing a clear baseline for evaluating the effects of treatment is important. Neuropsychiatric inventory (NPI) or the behavioral pathology in AD rating scale (BEHAVE-AD) is the standardized tool based on caregiver's interview and used commonly for overall BPSD assessment.[99,100]

Nonpharmacological Interventions

Currently, NPI is considered the first-line treatment for the management of BPSD.[101,102] The nonpharmacologic methods underlying the DICE approach (Description of the problem, Investigation for the cause, Create a treatment plan, Evaluate the Effectiveness) has substantial evidence, including detailed assessments of underlying causes and caregiver interventions.[103]

NPI can be delivered by targeting the patients, caregivers, and the environment.[103] The intervention extends from sensory stimulation to cognitive and behavioral approaches. Sensory stimulation includes aromatherapy, massage, music/dance therapy, light therapy, snoezelen therapy, and TENS therapy. Cognition-oriented interventions incorporate reminiscence therapy, validation therapy, and simulated presence therapy.

All these nonpharmacological interventions confer potential benefits; however, the strength of evidence is overall insufficient. Music-based intervention is effective in reducing depressive symptoms and anxiety, and improve the overall quality of life.[104] Massage therapy may positively affect behavioral and psychological symptoms; however, more research is warranted.[105,106] Aromatherapy, light therapy, and TENS have limited benefits for people with dementia.[107,108] The evidence to support cognitive/emotion-oriented interventions, which include validation therapy, simulated presence therapy, and reminiscence therapy, is lacking.[109,110]

Patients with higher cognitive functioning, fewer obstacles to perform ADL, communication, and speech may better respond to these interventions. Staff barriers and the presence of pain are associated with a poor outcome.[111] Nonpharmacological interventions need to be tailored, and they should be chosen considering the possible causes of a patient's behavioral and psychological symptoms.[112]

Psychological Therapy

There is evidence that structured psychological interventions combined with routine care can decrease symptoms of depression and anxiety in dementia. They improve patients' psychological well-being, while no impact was observed on everyday activities and quality of life.[113] Short-term group therapy immediately after diagnosis of dementia aids in improving symptoms of depression and quality of life, while personalized and multicomponent therapy appears to reduce improper behavior in people with a mild-to-moderate grade of impairment.[114]

Pharmacotherapy

Antidepressants: Antidepressants are preferred for the management of BPSD due to their low side effect but with limited evidence. They are more effective for managing agitation compared to depression, anxiety, or psychosis.[115]

In 2014, the CitAD trial showed promising evidence for the efficacy of Citalopram in reducing agitation, improving ADL performance, and caregiver stress in patients with AD. However, Citalopram had a risk of QT prolongation, limiting its wide use.[116] Although, Sertraline has a good cardiac safety profile, evidence for its efficacy is mixed. Antidepressants with anticholinergic properties like paroxetine and tricyclic antidepressants should usually be avoided.[115] Though low dose of Trazodone at 50 mg may not be effective in improving sleep and 150–300 mg daily dose was found useful in diminishing some behavioral symptoms in FTD.[117,118] Mirtazapine didn't show any positive effect in sleep disorder in AD and rather worsened daytime sleep patterns.[119]

Antipsychotics: Antipsychotics have reasonable efficacy in treating agitation, psychosis, and aggression in persons with dementia. However, due to the adverse effect profile, their use is reserved for severe symptoms refractory to nonpharmacological interventions.[120] Atypical antipsychotics are more effective for treating BPSD as compared to typical antipsychotics.[121] Risperidone, Aripiprazole, Olanzapine, Haloperidol are the

most common antipsychotics used in BPSD. American Psychiatric Association recommended that antipsychotics should be started at a low dose to be optimized up to the minimum effective dose as tolerated. Antipsychotics should be tapered and withdrawn after four weeks of adequate dose if there is no clinical response. In patients showing response to antipsychotics, medications should be tapered after four months of starting, except the patient encountered a recurrence of symptoms. A recent Cochrane review concluded that discontinuation of antipsychotics after three months of treatment is not associated with worsening BPSD or quality of life except in patients with more severe BPSD at baseline.[122] Antipsychotic medications should be avoided in patients with Lewy body disease due to the high risk of extrapyramidal symptoms; instead, cognitive enhancer like donepezil can be used to treat BPSD in patients with LBD.[123]

Pimavanserin is recently approved for treating PD psychosis with modest efficacy. However, there is a concern for QT prolongation, drug interactions, increased mortality risk, and exorbitant cost.[124] Pimavanserin showed a benefit for psychosis in AD at six weeks without any cognitive decline, but not after 12 weeks.[125] Brexpiprazole (2 mg per day) is found to reduce agitation compared to placebo in patients with AD in a recent randomized controlled trial.[126]

Benzodiazepines: Benzodiazepines are widely used in dementia; however, evidence for efficacy is inadequate with the risk of side effects.[120] Lorazepam can be used in extreme agitation or aggression, which is not manageable by other interventions.[127] Clonazepam can help in REM behavior disorder.[128]

Pharmacotherapy may work as an adjunct to rehabilitation programs to enhance patient compliance and help them become more independent in daily living activities.

Bladder Involvement and Lower Urinary Tract Dysfunction (LUTD)

LUTD is a distressing condition in persons with dementia and is associated with ADL impairment and poor quality of life.[129] LUTD refers to problems of either urinary storage or voiding. Storage symptoms include urinary urgency, frequency, nocturia, and urinary incontinence (UI), whereas voiding symptoms include hesitancy, poor flow, straining, a sensation of incomplete voiding, and urinary retention. The type of lower urinary tract symptoms is determined by the lesion distribution in the neural pathway.[130]

UI is the most prevalent complaint among storage symptoms in advanced dementia. In addition to cognitive and behavioral problems, urological problems such as detrusor overactivity can lead to UI in persons with dementia.[131]

Functional incontinence is UI that is not related to lower urinary tract pathology or micturition mechanism but occurs due to the inability to reach the toilet in time due to an impaired cognitive activity or mobility issues. People with vascular dementia, DLB, and FTD experience UI relatively at an early stage compared to AD and PD with dementia.[131,132]

A detailed history regarding the LUT symptoms, patient fluid intake, voiding complaints, and medications with anticholinergic effects should be considered. Maintaining a bladder diary that notes the time and volume of fluid intake and each voiding episode along with incontinence is essential as it provides a real-time, objective assessment of urinary symptoms. Peri-anal sensation, anal sphincter tone, bulbocavernosus reflex should be tested along with local abdomen and pelvis examination. Urinalysis is required to rule out urinary tract infections. Ultrasonography should be undertaken to check for pressure-related changes in the upper urinary tract (like hydronephrosis), bladder calculi, and significant post-void residual (PVR) urine. Raised PVR indicates voiding dysfunction. It could be due to acontractile detrusor or bladder outlet obstruction, for which urodynamics study would be required.[131]

Management

The management of LUTD is individually tailored according to disease status, the pattern of bladder dysfunction, and patient expectation, counting other factors such as cognitive impairment, mobility issues, and general health conditions.[133] Among the nonpharmacological management strategies, behavioral therapy is considered to be the first-line treatment. If it is not successful alone, pharmacological therapy can be combined.

Behavioral Therapy

Behavioral therapy programs include prompted voiding, timed voiding, and pelvic floor muscles training (PMFT) to alleviate UI.

Prompted voiding: It can be tried as per the predetermined schedule in patients with cognitive impairment. The caregiver may enquire at regular intervals (two hourly during daytime) and provide support during toileting.[129,134,135] Patients with low motivation and mobility issues can be trained for prompted and scheduled toileting.[133]

Timed voiding: Timed voiding is practiced by patients themselves, in which they follow a planned schedule to empty the bladder to prevent UI. Timed voiding is preferably used for patients with relatively intact cognition with neurogenic bladder.[129]

PFMT: Voluntary contraction of pelvic floor muscles causes activation of an inhibitory reflex on detrusor muscles and increases urethral pressure.[136] Commonly, patients tend to contract rectus abdominis or glutei, rather than the pelvic floor muscles. Hence, it's important to teach PFMT properly. By and large, the anus is contracted first as if raising the anus from the ground, and the pelvic muscles are contracted and relaxed alternatingly.[129] Supervised PFMT is an effective approach to prevent UI in the elderly with mild cognitive impairment.[137] It can be combined with auditory or visual biofeedback by recording biological signals (EMG activity) from the pelvic floor muscles to improve the therapeutic effect.[138]

Pharmacological Management

Antimuscarinic agents: Antimuscarinic agents suppress detrusor contraction through antagonism to muscarinic receptors and improve urgency and urge incontinence.[139] Oxybutynin, tolterodine, trospium are nonselective antimuscarinics

as they act on all muscarinic receptors (M1–M5), while darifenacin and solifenacin are selective antimuscarinics with affinity to M2/M3 receptors located in the bladder. These anticholinergic medications have to be used cautiously in persons with dementia for obvious reasons as their mechanism of action affects memory adversely.

Mirabegron: Mirabegron, a beta-3 receptor agonist, activates the beta-3 receptors in the detrusor muscle, leading to relaxation of the bladder and improve bladder capacity.[140] A recent clinical trial (PILLAR) reported no adverse impact on cognition following treatment with Mirabegron over 12 weeks.[141]

Other than behavioral and pharmacological treatment for bladder dysfunction, supportive measures like the use of adult diapers, external sheath drainage in males, especially during the night, intermittent catheterization can be effectively used for bladder management. Some cases may require surgical intervention like patients with prostatomegaly, augmentation cystoplasty, etc.

Inappropriate Sexual Behavior in Dementia

Inappropriate sexual behavior (ISB) is a relatively common troublesome behavior in people living with dementia.[142] It causes significant distress for family caregivers attributing to the decision of institutionalization of a patient in selected cases.[143] ISB has been estimated to be present in 7%–25% of dementia patients, and its prevalence is more in nursing facilities and in a patient with severe cognitive impairment. Inappropriate sexual talk is the most commonly reported behavior, almost 60% of all ISB. It is strongly associated with the presence of BPSD.[142,144] People with vascular dementia tend to have more ISB.[145] Moreover, hyposexual behavior and apathy towards the partner are mostly reported compared to aberrant or ISB among people with FTD.[146]

Management of Inappropriate Sexual Behavior

It becomes an important issue to be addressed by the rehabilitation team if patients are showing ISB.

Existing literature provides several nonpharmacological and pharmacological approaches to treat dementia-related ISB; evidence regarding their efficacy is insufficient due to limited research in this area.[142,145,147]

Nonpharmacological Management

Nonpharmacological methods are the first-line treatment, and it should be an individualized approach involving family and caregivers. Common examples include the elimination of aggravating factors, distraction tactics, and chances to relieve sexual urges.

Pharmacological Management

Pharmacological treatments should be prescribed only when the conservative approach fails to relieve the symptoms. In addition, it is necessary to explain the possible benefits and risks of the drugs to the patients or family members, as all the medications can only be used off-label. Pharmacological treatments used to treat ISB include antidepressants, antipsychotics, anticonvulsants, cholinesterase inhibitors, hormonal agents, and beta-blockers.

Activities of Daily Living in Dementia

A decline in the performance of ADL is a defining characteristic of dementia. ADL consists of basic ADL (BADL) such as eating, grooming, bathing, dressing, and toileting, and instrumental ADL (IADL) such as cooking meals, doing household chores, shopping, handling finances and other more complex skills. BADL is affected in moderate to severe ADL stages, whereas impairment in IADL is detected in mild cognitive impairment and early stages of dementia.[148] Cognitive decline is strongly correlated with the inability to perform ADL and poor functional status.[149] Executive cognitive dysfunction is likely to undermine the ability to carry out complex IADL as well as BADL. Behavioral symptoms, especially apathy, is significantly associated with impairments in functional abilities.[150]

Multimodal occupational therapy intervention uses a consolidated strategy that includes task simplification, environmental adjustment, adaptive devices, and caregiver education to improve functional abilities and performance in ADL.[151,152] Therapists involve the caregiver during the session to identify the desired goals, tailor the activities for the person with dementia, and mitigate the environmental barriers to maintain their interest and participation. There is substantial evidence that home-based occupational therapy improves ADL performance as well as the quality of life.[153]

An evidence-based review proposed that patient-tailored and activity-based leisure intervention may enhance caregiver satisfaction. In contrast, interventions targeted on ADL and IADL may improve the well-being and quality of life of people living with dementia. Social participation and communication, primarily involving people in the early or middle stage of dementia when verbal abilities are spared, found to have a short-term positive effect on the patient's well-being.[154]

Assistive Technology and Devices in Dementia Care

Assistive technology can play an important role in dementia care. It has the potential to ease ADL tasks, build confidence and safety, and reduce neuropsychiatric symptoms, and thus helps to improve the quality of life of people living with dementia and their caregivers.[155]

Simple assistive devices include walking sticks, standard and wheeled walkers, manual wheelchairs, and motorized wheelchairs and these are often prescribed to people with dementia. Walking using a cane or wheeled walker demands cognitive abilities, leading to a decrease in walking speed in mild to moderate dementia.[156,157] Assistive devices for daily living can be used to improve memory, communication difficulties, and orientation. Prospective memory aids consisting of digital display of calendar, voice reminder device for keeping daily appointments, medication schedule, etc.[158]

Targeted use of assistive technology can improve safety and reduce distress in caregivers. These devices include automated shut-off devices that can stop the gas supply after use, sensor lights, automatic water taps that can prevent wastage of water, and or fall sensors that can record if a person has sustained a fall. Besides, these safety devices also include tracking technologies based on

a global positioning system that detect the individuals' location if they were to get lost.[159] Social interaction with friends and family has a positive impact on cognition and well-being. Technology facilitated games can stimulate communication and social behavior.[160] Assistive devices focus on improving the quality of life and should be prescribed considering the patient's needs and privacy.[161]

Most of the rehabilitation strategies discussed in this article have got a global application and hence can be useful irrespective of the geographic location. The use of local and affordable material and technology has to be prioritized to get cost-effective and optimum gain out of rehabilitation programs in dementia care.

In India, the concept of multidisciplinary rehabilitation is confined to very few higher education teaching institutes or hospitals in big cities. Therefore, the horizontal spread of these services in tier-2 cities and towns, and awareness about rehabilitation among the public and other medical/health professionals would be the initial step to improve dementia care in the country.

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