

Cognitive Impairment and Dementia

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- Dr Mina Chandra

Introduction

There has been increase in life expectancy globally with improvement in nutrition and medical services. Age associated decline in function is observable with every organ of the body, with brain being no exception. Amongst different functions of the brain, cognition is one of the most important.

What is Cognition?

Cognition is the sum total of all intellectual faculties like memory, language, planning, judgement, mathematical ability, abstraction etc. Cognition is essential for independent functioning. To summarise, cognition is what makes human beings, human.

While there may be some decline in cognition with age, cognitive impairment is a cardinal symptom in neuropsychiatric disorders like Mild Cognitive Impairment (MCI) and Dementia.

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What is Mild Cognitive Impairment?

Mild Cognitive Impairment (MCI) is a condition in which the impact of cognitive decline on social and occupational functioning is mitigated by use of secondary aids and compensatory strategies like using diaries and lists as reminders, involving family members to ensure minimisation of errors etc. One third to half cases of MCI progress to Dementia.

What is Dementia?

In contrast to MCI, the decline in cognition in Dementia is accompanied by adverse impact on social and occupational functioning which cannot be addressed by compensatory strategies.

How common is MCI and Dementia?

MCI is a common condition and affects 12 to 18 percent of persons older than 60 years. Though Dementia is less common, it still affects 50 million persons globally and more than 4 million Indians.

How to identify MCI and Dementia? Common Symptoms and Subtypes

There are six cardinal domains which may be affected in MCI and Dementia. Patients may show impairment in one or more domains.

1. Memory: can be impaired in old age, MCI and Dementia. However, there can be cases of MCI and Dementia where memory is preserved. Initially, the loss of memory is apparent for recent events and information acquired recently e. g, what a person had for breakfast while information

acquired many years back, like events in their childhood and adulthood, is preserved. This pattern often appears confusing to general public as to how the memory for distant events is intact while the memory for current events is lost. It is important to understand that this is a typical pattern in MCI and Dementia and occurs due to deficits in acquiring and storing new information while the information stored earlier, prior to the onset of disease, may be preserved for a longer period. However, as the illness progresses, even memory of older events will get lost.

2. **Attention and Concentration:** Attention is the ability to focus while concentration is the ability to maintain, sustain and shift focus. Persons with cognitive impairment report getting easily distracted with difficulty in doing several unrelated tasks at the same time (multi-tasking) and making simple errors like copying list of numbers (e. g, phone numbers) or information (e. g. address) incorrectly
3. **Executive Functioning:** refers to the ability to plan, organise, make decisions from complex decisions like investment to simple decisions like which clothes to wear in the summer season. For example, when we make a financial investment, we find out the possible options, their financial returns, the tax benefit, the lock in period, time when we want ready cash or liquidity. The ability to do so is through executive function. Similarly, planning meals for family and guests, requires understanding of number of persons for whom food has to be prepared, portion size for each person so that all dishes are adequate in quantity, any special food requirements e. g. for children or older people. This complex task, though commonly done on a daily basis, is made possible with executive functioning.
A person with dementia may make unwise investments and lose money. Similarly, a house wife who could plan and cook for both small numbers (daily cooking for family) and large numbers (family gathering with guests) may no longer be able to do so after getting dementia. She may not be able to cook complex dishes, or may cook inadequate amounts or large amounts which can go waste.
4. **Language deficits:** include difficulty in naming, reduction in vocabulary, difficulty in communicating effectively and difficulty in understanding what others are telling. There may be difficulty in using syntax and grammar.
For example, a patient with dementia may not be able to use the word “key” and instead state “that which opens a lock” instead. While speaking, they may lose their chain of thought during a conversation. Similarly, if a number of sentences are spoken to them, they may not be able to keep up with the topic. Persons who know and speak several languages i.e. those who are multilingual are able to preserve language function longer than those who speak a single language.

5. Perceptual — Motor: refers to the ability to understand the objects perceived by our five senses: (eyes, ears, nose, taste and touch) and take action

For example while driving, we see the position and relative speeds of vehicles in front of us, by our side and behind us, see the indicators for vehicles about to change lanes or make turns, listen to the horns of vehicles trying to pass us or overtake us. Our brain processes visual and auditory information to modulate our speed and choice of lane to ensure safe driving.

6. Social Cognition: refers to the ability to express and behave in accordance with social and cultural norms. Persons with Dementia may exhibit impaired social cognition.

For example, the host, instead of serving guests in a family gathering, might first serve himself/ herself and start eating food contrary to Indian cultural traditions.

The symptoms develop over time and progressively worsen usually. The different levels of severity of dementia are as follows:

1. Mild Dementia: Person may become forgetful, get lost in familiar surroundings or may lose track of time. However, they respond to cues and hints.
2. Moderate Dementia: Person may experience loss of memory of recent events, may get confused about location and pathway to different rooms within his own home, difficulty in communication, need help in self-care and may show psychological and behavioral symptoms like depression, anxiety, agitation, wandering away from home etc.
3. Late Stage/ Severe Dementia: There is severe cognitive impairment in nearly all the domains with inability to maintain independent functioning. The patient becomes completely dependent on others for basic needs.

In advanced cases of Dementia, person may not be able to recognise close family members and may even forget their own names. They may need assistance in feeding, self-care and hygiene, dressing, feeding and ambulation. Even in such advanced cases, persons may still be able to understand and enjoy music and art and remember brief disjointed pieces of information from their past.

Types of Dementia

Dementia can occur due to several causes. Accordingly, Dementias are classified as reversible (where improvement is possible with treatment) and irreversible which is marked by progressive worsening.

Reversible Dementia may occur due to Hypothyroidism (lower levels of thyroid hormones), Deficiency of Vitamin B12 and Folate, increase in fluid in the

brain (called Normal Pressure Hydrocephalous), Infections like Syphilis, HIV and other conditions.

Generally, the term 'Dementia' is used for irreversible types. The common types of Irreversible Dementias are neurodegenerative diseases like Alzheimer's Disease, Parkinson's Disease, Dementia with Lewy Bodies and Fronto-Temporal Dementia. Another common subtype is Vascular Dementia which is due to impaired blood supply to brain and is commonly seen with long standing Hypertension, Diabetes, Raised Cholesterol Levels (Dyslipidaemia), Paralytic Stroke etc.

How to Differentiate from apparently Similar But Different Conditions?

The most common condition with some symptoms similar to dementia is Age associated Memory Decline. This is normal accompaniment of ageing and requires no treatment.

Similarly, Subjective Memory Loss is a condition wherein on examination by trained specialist there is no objective impairment even though the patient thinks that he has reduced memory. This requires no treatment.

In addition, Depression may present as cognitive impairment and this condition is known as Pseudo Dementia. However, in such cases other symptoms of depression like sadness, decreased interest in work, social interaction and pleasurable activities, easy fatigability, sleep and appetite disturbances will also be present.

What is meant by Activities of Daily Living (ADL)? What is functional Impairment? What happens to ADL in Dementia?

Activities of Daily Living (ADL) are those tasks which are done on a day-to-day basis as essential to care of self and maintaining independence. These include toilet care, bathing, dressing, feeding, walking etc.

Instrumental Activities of Daily Living (IADL) are complex activities required for independent living in society like shopping, cooking, doing household chores, managing transportation and finances.

Both ADL and IADL are conceptualized in the brain and implemented as per directions from the brain. Both of them require the cognitive modalities of memory, executive function (planning, organizing), concentration to complete the task, language (to communicate), perceptual motor skill (procedure of performing the task in context of surroundings) and social cognition (adhering to when, where and how the task should be performed as per social and cultural norms).

As dementia advances, there is progressive decline in functional capacity of the patient for IADL initially and ADL eventually and the patient may become progressively dependent on others for care and survival.

How does a Doctor evaluate MCI and Dementia?

A person with cognitive impairment is evaluated by a specialist physician, psychiatrist and/ or neurologist by taking detailed history, conducting detailed physical, neurological examination, mental status examination. Neuropsychological testing may also be conducted along with relevant blood tests, CT Scan or MRI of brain and other specialized tests to identify the cause of dementia.

Treatment

Treatment of Dementia is both by medications and by cognitive exercises. The medications are specialised and are prescribed by a psychiatrist or neurologist. The medications target cognitive impairment, behavioural and psychological symptoms, sleep and appetite disturbances. Unfortunately, there is no cure for Dementia as yet.

The principle of "Use it or Lose it" reflects the beneficial effect of continuing intellectual engagement and participation. Patients with mild and moderate dementia must continue with their daily activities and skills as long as they can to maintain cognitive reserve and productivity. Hence, such patients must be encouraged to continue knitting, crochet, embroidery, sewing, drawing, painting, cooking, reading, gardening, shopping for daily needs, managing small budgets etc. for as long as they can and even if they make minor errors. This ensures cognitive stimulation, intellectual engagement, productivity and self-efficacy.

It must be ensured that patients with dementia have prescription glasses for visual impairment and hearing aids for hearing impairment so that they can effectively communicate with others. Further, efforts should be made that persons with mild to moderate dementia participate in family gatherings and functions as well as pleasure trips with their family. This ensures adequate socialisation, maintains self-concept and a sense of purpose as well as prevents isolation.

In addition, efforts must be made to ensure appropriate home environment. Assistive devices, hand rails and anti-skid tiles should be placed in wash rooms to facilitate independent use of washing facilities. The chairs and bed should be of appropriate height to allow the patient to sit or lie down and get up independently. The chairs should have arms to facilitate sitting and getting up without external assistance. To address visuo-spatial deficits, names of rooms can be written on the doors like kitchen, bathroom, living room, patient's room. If staying in an apartment complex with similar dwelling units, the colour of the main gate of the apartment can be painted differently and in a primary colour, so that the person with dementia can easily identify their own home.

Several cognitive exercises and interventions have been demonstrated to have evidence base including Cognitive Stimulation Therapy, Cognitive Retraining,

Reminiscence Therapy, Light Exercise etc. The goals of these interventions are multi-fold. The primary aim of these interventions is to stimulate neural circuits to prevent decline of previously acquired skills due to lack of practice. In addition, group-based therapies provide conducive environment for social interaction, social affiliation and friendships. Last but not the least, these interventions aim to preserve sense of self, a compassionate self-concept and a positive self-identity.

In advanced cases, when patients with dementia may not be able to remember their close family members or even their own names, they can still benefit non-pharmacological interventions like art therapy, music and dance therapy, aroma therapy, pain management, sleep hygiene etc. with demonstrable improvement in mood and subjective well-being as well as reduced irritability and agitation.

If the person with dementia is staying in a long stay facility, it is incumbent on staff of that facility to implement above strategies to ensure well-being and quality of life.

Prevention Strategies

While dementias with genetic basis cannot be prevented, cognition can be preserved by taking balanced diet to avoid nutritional deficiencies like vitamin B12, Folate etc., maintaining regular activity with productivity as long as one can, regular exercise, abstinence from tobacco, alcohol and other drugs, appropriate treatment of hypertension, diabetes and dyslipidaemia, hypothyroidism etc.

Conclusion

Dementia is a serious condition. Early identification and treatment can help in reversing cognitive impairment in case of reversible dementias and slowing the decline and maintaining quality of life for genetic neurodegenerative dementias.

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