We all forget things once in a while, forgetting is a part of life and it often becomes more common with people aging. Mental illness is yet another factor that precipitates forgetfulness. Alzheimer disease (AD), which affects some older people, is, however, different from everyday forgetting. It is a condition that permanently affects the brain, and over time, makes it harder to remember even basic stuff, like how to tie a shoe. Eventually, the person may have trouble remembering the names and faces of family members or even who he or she is. This can be very sad for the person and their families. Alzheimer’s disease is among the most feared consequences of old age.

Alzheimer’s disease is named after Dr Alois Alzheimer, a German neuropathologist and psychiatrist, in 1906.

**Definition:** Alzheimer’s disease is a progressive neurologic disease of the brain leading to the irreversible loss of neurons and the loss of intellectual abilities, including memory and reasoning.

**Incidence**

It is estimated that there are currently about 18 million people worldwide with Alzheimer’s disease. This figure is projected to nearly double by 2025 to 34 million. Currently, more than 50 percent of people with Alzheimer’s disease live in developing countries and by 2025, this will be over 70 percent. Ten percent of people over 65 years of age and 50 percent of those over 85 years of age have Alzheimer’s disease.

**Risk Factors**

*Age:* Advancing age is the number one risk factor for developing Alzheimer’s disease. One out of eight people over the age of 65 has Alzheimer’s disease, and almost one out of every two people over the age of 85 has Alzheimer’s.

*Family history:* People who have a parent or sibling that developed Alzheimer’s disease are two to three times more likely to develop the disease.

The second kind of gene is a “deterministic gene” and is much rarer than risk genes. Deterministic genes are only found in a few hundred extended families around the world. If a deterministic gene is inherited, the person will undoubtedly develop Alzheimer’s.

**Lifestyle factors:** Lifestyle factors can influence a person’s risk of developing Alzheimer’s disease. A connection has been found between serious head injury and future development of Alzheimer’s, so those who practice safety measures such as wearing seat belts and do not engage in activities where there is a high risk of falling are at an advantage.

**Heart health and brain health:** Those who are free of heart disease or related conditions are at a lower risk of developing Alzheimer’s.

**Gender:** Women are more likely than men to develop the disease, in part because they live longer and as stated above, the risk of the disease increases greatly with advanced age.

**Aetiology**

Scientists do not yet fully understand what causes Alzheimer’s disease. The cause(s) of Alzheimer’s disease remain unknown.

**Patho-Physiology**

*Acetylcholine alteration:* In the brain of a person with Alzheimer’s, the enzyme required to produce acetylcholine is reduced in the nucleus basalis of the inferior fore brain area, because of decreased acetylcholine, the amount of neurotransmitter reduces that is released to cells in the cortex which result in a disruption of the cognitive process. Other neurotransmitters implicated in pathology of disease are norepinephrine, serotonin, dopamine and amino acid glutamate.

*Plaques and Tangles:* These occur in the brain of individual with Alzheimer’s. The plaques are made of protein called beta-amyloid, which are fragment of larger protein called amyloid precursor protein. Tangles are made up of a special kind of
cellular protein called tau protein. It is considered that plaque and tangles contribute to the destruction and death of neuron, leading to memory failure and personality changes.

**Symptoms**

Alzheimer's disease symptoms include difficulty with many areas of mental function, including:

- Language
- Memory
- Perception
- Emotional behaviour or personality
- Cognitive skills (such as calculation, abstract thinking, or judgment).

Dementia usually first appears as forgetfulness.

Mild cognitive impairment is the stage between normal forgetfulness due to aging, and the development of AD.

Symptoms of mild cognitive impairment include:

- Forgetting recent events or conversations
- Difficulty in performing more than one task at a time
- Difficulty in solving problems
- Taking longer to perform more difficult activities.

The early symptoms of AD can include:

- Language problems, such as trouble in finding the name of familiar objects
- Misplacing items
- Getting lost on familiar routes
- Personality changes and loss of social skills
- Losing interest in things previously enjoyed, flat mood
- Difficulty in performing tasks that take some thought, but used to come easily, such as balancing a check book, playing complex games (such as bridge), and learning new information or routines.

As the AD becomes worse, symptoms are more obvious and interfere with one's ability to take care of oneself. Symptoms can include:

- Forgetting details about current events
- Forgetting events in one's own life history, losing awareness of what one is
- Change in sleep patterns, often waking up at night
- Difficulty in reading or writing
- Poor judgment and loss of ability to recognise danger
- Using the wrong word, mispronouncing words, speaking in confusing sentences
- Withdrawing from social contact
- Having hallucinations, arguments, striking out, and violent behaviour
- Having delusions, depression, agitation
- Difficulty in doing basic tasks, such as preparing meals, choosing proper clothing, and driving.

People with severe AD can no longer:

- Understand language
- Recognise family members
- Perform basic activities of daily living, such as eating, dressing, and bathing.

Other symptoms that may occur with AD:

- Incontinence
- Swallowing problems.

**Diagnosis**

**Medical History and Physical Examination:**

Patient's health history, including other medical conditions the patient has, recent or past illnesses, and progressive changes in mental function, behaviour, or daily activities. Evaluate the patient's hearing and vision, and check blood pressure and other physical signs. A neurological test will also be conducted to check the patient's reflexes, coordination, and eye movement.

**Laboratory Tests:** Blood, urine, and possibly spinal fluid samples are collected. They can help the doctor evaluate other possible causes of dementia, such as thyroid imbalances or vitamin deficiencies.

**Neuro-psychological Tests:** A number of psychological tests are used to assess difficulties in attention, perception, memory, language, and problem-solving, social, and language skills. One commonly used test is the Mini-Mental State Exam (MMSE), which uses a series of questions and tasks to evaluate cognitive function.

**Brain-Imaging Scans:** Imaging tests are useful for ruling out blood clots, tumours, or other structural abnormalities in the brain that may be causing signs of dementia. These tests include magnetic resonance
imaging (MRI) or computed tomography (CT)

**Treatment**

At present, there is no cure for Alzheimer’s disease. However, some drugs are available that may slow the cognitive decline of the disease.

*Cholinesterase inhibitors* (generally used to treat mild-to-moderate Alzheimer’s; donepezil is also administered in treatment of severe dementia)

- **Rivastigmine**
- **Galantamine (Razadyne)**. Galantamine protects the cholinergic system and acts on nicotine receptors, which are also depleted during Alzheimer’s.

*N-methyl-D-aspartate (NMDA) receptor antagonists* (used to treat moderate-to-severe Alzheimer’s)

- Memantine (Namenda) is approved for treatment of moderate-to-severe Alzheimer’s disease.

**Treatment of psychiatric symptoms**

- Antipsychotics
- Mood-stabilising anticonvulsants
- Anxiolytics, and
- Beta-blockers

**Home Treatment in Early Stages**

*Telling the Patient:* Often doctors will not tell patients that they have Alzheimer’s. If a patient expresses a need to know the truth, it should be disclosed. Both the caregiver and the patient can then begin to address issues that can be controlled, such as access to support groups and drug research.

*Mood and Emotional Behaviour:* Patients display abrupt mood swings, and many become aggressive and angry. Some of this erratic behaviour is caused by chemical changes in the brain. But it may also be due to the experience of losing knowledge and understanding of one’s surroundings, causing fear and frustration that patients can no longer express verbally.

Following recommendations for caregivers may help soothe patients and avoid agitation:

- Keep environmental distractions and noise at a minimum if possible.
- Speak clearly.
- Use a combination of facial expressions, voice tones, and words for communicating emotions.
- Limit choices (such as clothing selection).

- Offer diversions, such as a snack or car ride, if the patient starts shouting or exhibiting other disruptive behaviour.
- Simply touching and talking may also help.
- Maintain as natural an attitude as possible. Patients with Alzheimer’s disease can be highly sensitive to the caregiver’s underlying emotions and react negatively to patronisation or signals of anger and frustration.
- Showing movies or videos of family members and events from the patient’s past may be comforting.

**Appearance and Cleanliness:** For the caregiver, grooming the patient may be an alienating experience. Often patients with Alzheimer’s disease lose their sense of colour and design and will put on odd or mismatched clothing. It is important to maintain a sense of humour and perspective and to learn which battles are worth fighting and which ones are best abandoned.

**Driving:** As soon as Alzheimer’s is diagnosed, the patient should be prevented from driving.

**Wandering:** A potentially dangerous trait is the patient’s tendency to wander. At the point the patient develops this tendency, many caregivers feel it is time to seek out nursing homes or other protective institutions for their loved ones.

For those who remain at home, the following precautions are recommended:

- Locks should be installed outside the door, which the caregiver can open, but the patient cannot.
- Alarms may be installed at exits.
- A daily exercise programme should be implemented, which may help tire the patient.

**Speech Problems:** Speech therapy combined with Alzheimer’s disease medications may be helpful for maintaining verbal skills in patients with mild symptoms.

**Sexuality:** In many cases, the patient becomes sexually uninhibited. At the same time, the patient’s physical deterioration and receding capacity to recognise the spouse as a known and loved individual can make sexual activity unattractive for the caregiving spouse. Some patients may lose interest in sex.

**Home Treatment During Later Stages**

Patients with Alzheimer’s disease need 24-hour a day attention.
Incontinence: When the patient first shows signs of incontinence, urinary incontinence may be controlled for some time by trying to monitor timings of liquid intake, feeding, and urinating. Once a schedule has been established, the caregiver may be able to anticipate incontinent episodes and get the patient to the toilet before its occurrence.

Immobility and Pain: As the disease progresses, patients become immobile, literally forgetting how to move. Eventually, they become almost entirely wheelchair-bound or bedridden. Bedsores can be a major problem. Sheets must be kept clean, dry, and free of food. The patient’s skin should be washed frequently. The patient should be moved every 2 hours and the feet kept raised with pillows or pads. Exercises should be administered to the legs and arms to keep them flexible.

Dehydration: Dehydration can become a problem. It is important to encourage fluid intake equal to 8 glasses of water daily. Coffee and tea are diuretics and will deplete fluid.

Eating Problems: Weight loss and the gradual inability to swallow are two major related problems in late-stage Alzheimer’s and are associated with an increased risk of death. Weight gain, however, is linked to a lower risk of dying. The patient can be fed through a feeding syringe, or the caregiver can encourage chewing action by pushing gently on the bottom of the patient’s chin and on the lips. The caregiver should offer the patient foods of different consistency and flavour. Because choking is a danger, the care-giver should learn to administer the Heimlich maneuver.

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