Tangles and Plaques and Memory Loss

Rose had always been an active, healthy woman. At the age of 69, she liked to garden and volunteered at the local public school. She and her husband, Bob, enjoyed taking a walk together every evening. They travelled regularly to visit their children and grand children. Life was good! Then Bob passed away and life changed for Rose. She began to spend a lot of time alone at home. She found that she was becoming more and more forgetful, and even frequently felt confused about the date and time, or where she was. Her family worried that she had Alzheimer’s disease and that soon she would not be able to care for herself at all.

The fear of losing our mental faculties is the greatest concern about aging for many of us. When we misplace our keys or forget an appointment we wonder if that is an early sign of Alzheimer’s disease. And it is not an unreasonable concern, considering the high incidence of dementia with increasing age and that Alzheimer’s disease (AD) is the leading cause of dementia in those over age 60. Recent research indicates that early detection and diagnosis of the disease can result in better outcomes for both the individual and their family, but it is estimated that only 20 to 50% of dementia cases are recognized and treated. As populations age, it will become more and more important for the public to understand what Alzheimer’s disease is, how to recognize the warning signs, and where they can go for help.

Alzheimer’s disease is a progressive, degenerative disease that slowly destroys the memory and thinking skills, resulting in memory loss, deterioration of judgement and reasoning, difficulty with day-to-day tasks and changes in mood, behaviour and communication skills. Dementia is the general term used to describe this group of symptoms. Though dementia is related to many diseases such as cerebral vascular disease, frontotemporal brain disease, brain tumor or infections, AD is the most common cause of dementia in older people. An estimated 36 million people worldwide live with this disease and this number is expected to double every 20 years.

Named for the doctor who first identified it, Dr. Alois Alzheimer, AD has two characteristic features: tiny dense plaques or deposits scattered throughout the brain that become toxic to cells, and tangles of neural tissue that disrupt the brain processes. As the plaques and tangles progressively get worse, brain cells die and there is a decrease in the chemicals that allow communication between cells. Consequently, parts of the brain that normally work together become isolated and disconnected. The areas of the brain that are involved with memory and emotion are affected early in the progression of the disease. Eventually the person’s ability to think logically and make decisions is compromised. In the later stages of the disease, physical co-ordination and mobility deteriorate, resulting in a gradual physical decline. It is not clear what causes the disease, though researchers believe that it is related to both genetic, environmental and lifestyle factors. Disease of the blood vessels that supply the brain has been shown to be strongly related to the development of AD. As well, age related changes in the brain may harm neurons and contribute to the development of AD.

Alzheimer’s disease usually progresses slowly through three stages--- early, middle and late--- each with characteristic features. In the early stage, individuals with AD experience forgetfulness, communication difficulties and mood and behaviour changes. They usually retain many of their abilities and may not need much assistance with daily living. As the disease progresses to the middle stage, thinking abilities continue to deteriorate and assistance with some aspects of life-- typically with banking, shopping, driving, decision making-- is needed. During the late stage, verbal communication is lost and care in all aspects of life is required, 24 hours a day.

The process of diagnosis is usually started when the individual or a family member expresses a concern that difficulties with memory are causing problems in every day functioning or safety. The health care provider will begin with asking questions and doing testing to assess how severe the thinking problems have become. For example, they may ask questions about the difficulty of doing everyday things like driving, shopping for food and paying bills. They will want to talk with a family member or someone who knows the individual well about their memory problems and to double check on the accuracy of the information that the individual has given them. They will also carry out some standardized tests to evaluate memory, problem solving ability, counting and language skills.

The next step is to complete a medical history and physical examination directed at eliminating other possible causes of the symptoms. Tests may be ordered to help rule out medical problems such as thyroid disease, vitamin deficiency, brain tumour, stroke, medication intoxication, infection, anaemia, and depression. Computed tomography (CT) or magnetic resonance imaging (MRI) of the brain may be done to look for causes such as brain tumour or stroke. MRI and CT scans may not show structural changes in the brain due to AD until the disease has progressed to its later stages, so AD may be present even if the scan appears to be normal. Finally, a psychiatric evaluation may be requested in order to rule out illnesses such as depression that may contribute to dementia symptoms. The diagnosis of Alzheimer’s disease is made when significant decline in thinking and memory abilities that interferes with everyday functioning is clearly present, and when no apparent correctable cause for the symptoms can be found. Early diagnosis can lead to earlier treatment that can slow the progression of the disease and improve the quality of life for both the AD sufferer and their family.

Treatment is aimed at maintaining functioning for as long as possible, decreasing troubling behaviours and agitation, supporting function and safety by making changes in the home environment, and helping family and other caregivers to cope. Though there is no treatment for the underlying disease process, there are medications that help to maintain thinking and speaking functions by regulating the chemicals that transmit messages between nerve cells in the brain. Some of these medications are donepezil (Aricept), rivastigmine (Exelon), galantamine (Razadyne) and memantine (Namenda). They are usually quite well tolerated though they may cause side effects such as indigestion, diarrhea, loss of appetite, muscle cramps and fatigue. Unfortunately, they are not effective for everyone, and they lose their effectiveness over the long-term. Medication may also be used to treat behavioural disorders and agitation, but more and more it is being recognized that non-drug approaches to these challenging behaviours have better results with fewer risks. For example, by modifying the environment to eliminate bright lights, noise and other stimuli that may be difficult for the person with AD to understand and process, some troubling behaviours can be avoided. Caregivers can be trained to see behaviours as a mode of communication for the person with AD, and to interpret behaviours early to avoid escalation of agitation. With sensitivity to discomforts such as pain, hunger, or the need to go to the bathroom, caregivers can learn to anticipate these needs and avoid problems.

Caring for an individual with AD can have high costs for families, emotionally, physically and financially. Support for family and other caregivers is a significant part of the treatment of this disease. Families need information to help them to understand what to expect as the disease progresses. They need to be encouraged to have discussions about difficult decisions regarding care options, financial and estate management, and end of life planning while the person with AD is still able to be involved. Developing strong support networks of family and friends is another way that families can cope and handle the stresses of caring for a loved one with AD. As well they need to be encouraged to care for themselves by getting help so that they can get sufficient rest, eat well, exercise regularly and have time to themselves to rejuvenate.

Early diagnosis allows people with AD to get timely information and advice, to plan ahead while they still have the capacity to be involved in important decision making, and to get access to drugs that seem to be most effective in the early stages of the disease. However, evidence indicates that only 20 – 50% of dementia cases are recognized and diagnosed. There are many reasons for this. For one thing, many people consider that memory problems are an expected part of aging and just have to be tolerated. There is also a false notion that there is nothing that can be done for people with AD and this, combined with a stigma of dementia, can prevent open discussion and seeking of help. Better understanding about the differences between normal aging and AD can help people to recognize disturbing signs and to take action.

The Canadian Alzheimer Society has developed a list of ten warning signs that may indicate the need for further investigation: loss of memory of recent happenings that negatively impacts day to day functioning; difficulty performing familiar tasks; forgetting simple words or substituting words that do not make sense; becoming lost in familiar territory; decreased judgement or making poor decisions; difficulty with tasks that require abstract thinking such as balancing a check book; misplacing things in inappropriate places such as putting an iron in the freezer; exhibiting varied mood swings for no apparent reason; changes in personality such as confusion, suspiciousness or withdrawal; and loss of initiative , becoming passive and requiring prompting to become involved. Most people become a bit forgetful as they age. However, having difficulty retrieving a word or remembering a name is not the same as the memory loss of early dementia which interferes with everyday functioning. Significant memory loss is not a normal part of aging. It is a signal of a disease process that should be diagnosed and treated. There is hope for significant quality of life for AD sufferers and their families when diagnosis is made early enough for them to adjust to and make plans together for the life changes that they will inevitably experience because of the disease. Recognizing AD as a disease process rather than an unavoidable part of aging can also motivate people to take action to reduce their risk for the disease.

While there is no proven way to prevent Alzheimer’s disease, there is significant evidence to suggest that we can reduce our risk factors. Strong associations have been established between AD and vascular and metabolic conditions such as heart disease, stroke, high blood pressure and diabetes. This suggests that lifestyle factors that protect against these diseases could also decrease risk of AD. Particularly for those who have a family history of dementia, it may be worthwhile to consume a low fat diet, increase intake of cold water fish that are rich in omega 3 fatty acids, increase antioxidants in the diet by increasing intake of darkly coloured fruits and vegetables. Taking action to detect and treat high blood pressure and diabetes can also have an important impact on risk reduction. As well, a nutritious diet, regular physical activity, active social engagement and mentally stimulating activities can all contribute to healthy aging and decrease the likelihood of developing AD.

So what of our friend Rose? Her daughter helped her to make an appointment with her doctor for a thorough medical history and physical. She did, indeed, have significant dementia symptoms as her family had feared. However, a psychiatric evaluation uncovered depression as the cause of her symptoms. Her doctor prescribed an antidepressant and encouraged her to increase her social contact with friends and family. Rose lives with her son and his family now. She enjoys attending a women’s club on a weekly basis and participates in a gardening group. Though she still forgets things from time to time, her thinking is clear and she seldom experiences confusion. The lesson: memory problems are not all a result of AD, neither are they related to normal aging. Memory and thinking problems should be taken seriously and investigated to discover the underlying cause. The earlier the diagnosis, the earlier the treatment and better outcomes are the result.