

Chapter 1 : Alzheimer's stages: How the disease progresses - Mayo Clinic

The stages don't always fall into neat boxes, and the symptoms might vary -- but they can be a guide and help you plan for your friend or relative's care.

Repeats same conversations More abusive, anxious, or paranoid The disease course is divided into four stages, with a progressive pattern of cognitive and functional impairment. Pre-dementia The first symptoms are often mistakenly attributed to ageing or stress. In a small percentage, difficulties with language, executive functions, perception agnosia , or execution of movements apraxia are more prominent than memory problems. Reading and writing skills are also progressively lost. Common manifestations are wandering , irritability and labile affect , leading to crying, outbursts of unpremeditated aggression , or resistance to caregiving. Although aggressiveness can still be present, extreme apathy and exhaustion are much more common symptoms. The cause of death is usually an external factor, such as infection of pressure ulcers or pneumonia , not the disease itself. Most of autosomal dominant familial AD can be attributed to mutations in one of three genes: Cholinergic hypothesis The oldest, on which most currently available drug therapies are based, is the cholinergic hypothesis, [52] which proposes that AD is caused by reduced synthesis of the neurotransmitter acetylcholine. The cholinergic hypothesis has not maintained widespread support, largely because medications intended to treat acetylcholine deficiency have not been very effective. While apolipoproteins enhance the breakdown of beta amyloid, some isoforms are not very effective at this task such as APOE4 , leading to excess amyloid buildup in the brain. These toxic oligomers, also referred to as amyloid-derived diffusible ligands ADDLs , bind to a surface receptor on neurons and change the structure of the synapse, thereby disrupting neuronal communication. In this model, beta-amyloid plays a complementary role, by depressing synaptic function. In early , a trial of verubecestat , which inhibits the beta-secretase protein responsible for creating beta-amyloid protein was discontinued as an independent panel found "virtually no chance of finding a positive clinical effect". The tau hypothesis proposes that tau protein abnormalities initiate the disease cascade. Eventually, they form neurofibrillary tangles inside nerve cell bodies. These ions affect and are affected by tau, APP, and APOE, [69] and their dysregulation may cause oxidative stress that may contribute to the pathology. This loss results in gross atrophy of the affected regions, including degeneration in the temporal lobe and parietal lobe , and parts of the frontal cortex and cingulate gyrus. Tangles neurofibrillary tangles are aggregates of the microtubule-associated protein tau which has become hyperphosphorylated and accumulate inside the cells themselves. Although many older individuals develop some plaques and tangles as a consequence of ageing, the brains of people with AD have a greater number of them in specific brain regions such as the temporal lobe. The beta-amyloid fragment is crucial in the formation of senile plaques in AD. APP is critical to neuron growth, survival, and post-injury repair. Every neuron has a cytoskeleton , an internal support structure partly made up of structures called microtubules. These microtubules act like tracks, guiding nutrients and molecules from the body of the cell to the ends of the axon and back. A protein called tau stabilises the microtubules when phosphorylated , and is therefore called a microtubule-associated protein. Inflammation is a general marker of tissue damage in any disease, and may be either secondary to tissue damage in AD or a marker of an immunological response. Obesity and systemic inflammation may interfere with immunological processes which promote disease progression. The presence of characteristic neurological and neuropsychological features and the absence of alternative conditions is supportive. The diagnosis can be confirmed with very high accuracy post-mortem when brain material is available and can be examined histologically. A histopathologic confirmation including a microscopic examination of brain tissue is required for a definitive diagnosis. Good statistical reliability and validity have been shown between the diagnostic criteria and definitive histopathological confirmation. In the tests, people are instructed to copy drawings similar to the one shown in the picture, remember words, read, and subtract serial numbers. Neuropsychological tests such as the miniâ€”mental state examination MMSE are widely used to evaluate the cognitive impairments needed for diagnosis. More comprehensive test arrays are necessary for high reliability of results, particularly in the earliest stages of the disease. Further neurological examinations are crucial in the

differential diagnosis of AD and other diseases. Blood tests can identify other causes for dementia than AD [22] – causes which may, in rare cases, be reversible. It is also necessary to rule out delirium. Psychological tests for depression are employed, since depression can either be concurrent with AD see Depression of Alzheimer disease , an early sign of cognitive impairment, [] or even the cause. There is no definitive evidence to support that any particular measure is effective in preventing AD. Only further research, including clinical trials, will reveal whether these factors can help to prevent AD. This includes vitamin A, [] [] C, [] [] the alpha-tocopherol form of vitamin E, [] selenium , [] zinc , [] [] and folic acid with or without vitamin B Current treatments can be divided into pharmaceutical, psychosocial and caregiving. Medications Three-dimensional molecular model of donepezil , an acetylcholinesterase inhibitor used in the treatment of AD symptoms Molecular structure of memantine , a medication approved for advanced AD symptoms Five medications are currently used to treat the cognitive problems of AD: The benefit from their use is small.

Chapter 2 : The 7 Stages Of Alzheimer's Disease

The symptoms of Alzheimer's disease worsen over time, although the rate at which the disease progresses varies. On average, a person with Alzheimer's lives four to eight years after diagnosis, but can live as long as 20 years, depending on other factors.

There is no universally agreed upon staging system, so healthcare providers may use the one that they are most familiar with. Or your doctor may identify biomarkers that indicate your risk. But there will be no noticeable symptoms during the first stage, which can last for years or decades. Someone in this stage is fully independent. They may not even know they have the disease. Memory troubles are still very mild and may not be apparent to friends and family. While the entire stage lasts about seven years, the symptoms will slowly become clearer over a period of two to four years. Only people close to someone in this stage may notice the signs. Work quality will decline, and they may have trouble learning new skills. Other examples of stage 3 signs include: They may experience mild to moderate anxiety and denial. You or your loved one will have more trouble with complex but everyday tasks. Mood changes such as withdrawal and denial are more evident. Decreased emotional response is also frequent, especially in a challenging situation. New signs of decline that appear in stage 4 may include: But they may ask for help with other tasks such as writing checks, ordering food, and buying groceries. People in this stage will remember their own names and close family members, but major events, weather conditions, or their current address can be difficult to recall. At first, some people will forget to flush or throw tissue paper away. By this stage, memory is much worse, especially around current news and life events. Counting backward from 10 will be difficult. Your loved one may also confuse family members with other people and display personality changes.

Chapter 3 : Increased Levels of Human Herpesvirus Identified in Alzheimer Disease

The most common system, developed by Dr. Barry Reisberg of New York University, breaks the progression of Alzheimer's disease into seven stages. This framework for understanding the progression of the disease has been adopted and used by a number of healthcare providers as well as the Alzheimer's Association.

It involves plaques and tangles forming in the brain. Symptoms start gradually and are most likely to include a decline in cognitive function and language ability. People can have more than one type of dementia. Other assessments may include a blood or urine test, a CT or MRI scan of the brain, and screening for depression. What is your age? What is the time, to the nearest hour? What is the year? What is the name of the hospital or town we are in? Can you recognize two people, for example, the doctor, nurse, or carer? What is your date of birth? In which year did a well-known historical event happen? Count backward from 20 down to 1 Repeat an address at the end of the test that I will give you now for example, "42 West Street" A number of assessment tools are available to assess cognitive function. Genetic testing In some cases, genetic testing may be appropriate. Using this test early could indicate the likelihood of someone having or developing the disease. However, the test is controversial, and the results are not entirely reliable. The death of brain cells cannot be reversed. However, there are therapeutic interventions that can make it easier for people to live with the disease. Cholinesterase inhibitors that are approved for symptomatic relief in the U. Donepezil Aricept Rivastigmine Exelon Tacrine Cognex A different kind of drug, memantine Namenda , an NMDA receptor antagonist, may also be used , alone or in combination with a cholinesterase inhibitor. Other therapy The need for quality-of-life care becomes more important as the person becomes less able to live independently. It is a neurodegenerative disease, which means there is progressive brain cell death that happens over time. The plaques are found between the dying brain cells, and they are made from a protein known as beta-amyloid. The tangles occur within the nerve cells, and they are made from another protein, called tau. Researchers do not fully understand why these changes occur. Several different factors are believed to be involved. You can access it here. Risk factors Unavoidable risk factors for developing the condition include:

Chapter 4 : CSF p-Tau levels in the prediction of Alzheimer's disease

Alzheimer's disease is the most common type of dementia, a general term for a decline in mental abilities. With Alzheimer's disease, someone will experience a decline their abilities to: remember.

These occur in strokes and other brain injuries. The disease more commonly leads to problems with movement and motor control, but it also can cause dementia in some people. Frontotemporal dementia Frontotemporal dementia refers to a group of dementias that often cause changes in personality and behavior. It can also cause language difficulty. Mixed dementia Mixed dementia is dementia in which multiple types of dementia-causing brain abnormalities are present. No single test can determine whether you have dementia. Diagnosis is based on a range of medical tests and your medical history. If you exhibit symptoms of dementia your doctor will perform: Some common tests used to diagnose dementia include: The MMSE uses a point scale and includes questions that test memory, language use and comprehension, and motor skills, among other things. A score of 24 or higher indicates normal cognitive function. While scores 23 and below indicate that you have some degree of cognitive impairment. Mini-Cog test This is a short test for helping your doctor diagnose dementia. It involves these three steps: This score is based on your performance in these and other tests, as well as your medical history. The scores are as follows: A score of 0 is normal. A score of 0. A score of 1 is mild dementia. A score of 2 is moderate dementia. A score of 3 is severe dementia. Dementia progresses differently in everyone. MCI is characterized by losing things often, forgetfulness, and having trouble coming up with words. Mild dementia People may still be able to function independently in mild dementia. Common symptoms of mild dementia include: It becomes harder to perform regular daily activities and self-care as dementia progresses. Common symptoms during this stage include: Severe dementia often can cause: People with dementia will progress through these stages at different speeds and with differing symptoms. If you suspect you may be experiencing early symptoms of dementia, talk to your doctor. Early diagnosis also allows people to participate in clinical trials. This helps researchers develop new treatments and eventually find a cure. Medically reviewed by Timothy J.

Chapter 5 : Alzheimer's disease: Symptoms, stages, causes, and treatment

Low education levels are less than a high school education appear to be a risk factor for Alzheimer's disease. Complications Memory and language loss, impaired judgment, and other cognitive changes caused by Alzheimer's can complicate treatment for other health conditions.

See what types of behaviors are common in each of the stages as the disease progresses. Memory, thinking, judgment, language, problem-solving, personality and movement can all be affected by the disease. Dementia is a term used to describe a group of symptoms that affect intellectual and social abilities severely enough to interfere with daily function. The disease is a continuous process. People with MCI may have memory lapses when it comes to information that is usually easily remembered, such as conversations, recent events or appointments. People with MCI may also have trouble judging the amount of time needed for a task, or they may have difficulty correctly judging the number or sequence of steps needed to complete a task. The ability to make sound decisions can become harder for people with MCI. Memory loss for recent events. Individuals may have an especially hard time remembering newly learned information and ask the same question over and over. Difficulty with problem-solving, complex tasks and sound judgments. Planning a family event or balancing a checkbook may become overwhelming. Many people experience lapses in judgment, such as when making financial decisions. People may become subdued or withdrawn especially in socially challenging situations or show uncharacteristic irritability or anger. Reduced motivation to complete tasks also is common. Difficulty organizing and expressing thoughts. Finding the right words to describe objects or clearly express ideas becomes increasingly challenging. Getting lost or misplacing belongings. Individuals have increasing trouble finding their way around, even in familiar places. Show increasingly poor judgment and deepening confusion. Individuals lose track of where they are, the day of the week or the season. They may confuse family members or close friends with one another, or mistake strangers for family. They may wander, possibly in search of surroundings that feel more familiar. Experience even greater memory loss. People may forget details of their personal history, such as their address or phone number, or where they attended school. They repeat favorite stories or make up stories to fill gaps in memory. Need help with some daily activities. Assistance may be required with choosing proper clothing for the occasion or the weather and with bathing, grooming, using the bathroom and other self-care. Some individuals occasionally lose control of their bladder or bowel movements. Undergo significant changes in personality and behavior. Individuals often grow restless or agitated, especially late in the day. Some people may have outbursts of aggressive physical behavior. Lose the ability to communicate coherently. An individual can no longer converse or speak coherently, although he or she may occasionally say words or phrases. Require daily assistance with personal care. This includes total assistance with eating, dressing, using the bathroom and all other daily self-care tasks. Experience a decline in physical abilities. A person may become unable to walk without assistance, then unable to sit or hold up his or her head without support. Muscles may become rigid and reflexes abnormal. Eventually, a person loses the ability to swallow and to control bladder and bowel functions. Pneumonia is a common cause of death because impaired swallowing allows food or beverages to enter the lungs, where an infection can begin. Other common causes of death include dehydration, malnutrition and other infections.

Chapter 6 : What is Alzheimer's Disease? | CDC

Dementia symptoms change as patients progress through the different stages of the disease. Learn how stages of dementia are defined. The Seven Stages of Dementia - Alzheimer's Disease Center.

As the principal investigator of studies conducted by the National Institutes of Health, Dr. Normal Stage 1 Figure 1 At any age, persons may potentially be free of objective or subjective symptoms of cognition and functional decline and also free of associated behavioral and mood changes. We call these mentally healthy persons at any age, stage 1, or normal. Just forgetful, or is it dementia? The nature of these subjective complaints is characteristic. Elderly persons with these symptoms believe they can no longer recall names as well as they could 5 or 10 years previously. They also frequently develop the conviction that they can no longer recall where they have placed things as well as previously. Subjectively experienced difficulties in concentration and in finding the correct word when speaking, are also common. Stage 2 Figure 2 Various terms have been suggested for this condition, but normal aged forgetfulness is probably the most satisfactory terminology. These symptoms which, by definition, are not notable to intimates or other external observers of the person with normal aged forgetfulness, are generally benign. However, there is some recent evidence that persons with these symptoms do decline at greater rates than similarly aged persons and similarly healthy persons who are free of subjective complaints. Mild cognitive impairment Persons at this stage manifest deficits which are subtle, but which are noted by persons who are closely associated with the stage 3 subject. The subtle deficits may become manifest in diverse ways. The capacity to perform executive functions also becomes compromised. Commonly, for persons who are still working, job performance may decline. For those who must master new job skills, decrements in these capacities may become evident. MCI subjects who are not employed, but who plan complex social events, such as dinner parties, may manifest declines in their ability to organize such events. Many persons with these symptoms begin to experience anxiety, which may be overtly evident. The prognosis for persons with these subtle symptoms of impairment is variable, even when a select subject group who are free of overt medical or psychological conditions which might account for, or contribute to, the impairments are studied. A substantial proportion of these persons will not decline, even when followed over the course of many years. However, in a majority of persons with stage 3 symptoms, the overt decline will occur, and clear symptoms of dementia will become manifest over intervals of approximately 2 to 4 years. Even when symptoms do become noticeable, MCI subjects are commonly midway or near the end of this stage before concerns result in clinical consultation. Consequently, although progression to the next stage in MCI subjects commonly occurs in 2 to 3 years, the true duration of this stage, when it is a harbinger of subsequently manifest dementia, is probably approximately 7 years. Management of persons in this stage includes counseling regarding the desirability of continuing in a complex and demanding occupational role. The most common functioning deficit in these patients is a decreased ability to manage instrumental complex activities of daily life. The stage 4 patient shown has difficulty writing the correct date and the correct amount on the check Figure 4. Consequently, her husband has to supervise this activity. The mean duration of this stage is 2 years. Stage 4 Figure 4 Symptoms of impairment become evident in this stage. Similarly, overt mistakes in recalling the day of the week, month or season of the year may occur. Patients at this stage can still generally recall their correct current address. They can also generally correctly recall the weather conditions outside and very important current events, such as the name of a prominent head of state. Despite the overt deficits in cognition, persons at this stage can still potentially survive independently in community settings. However, functional capacities become compromised in the performance of instrumental i. For the stage 4 patient who is living independently, this may become evident in the form of difficulties in paying rent and other bills. A spouse may note difficulties in writing the correct date and the correct amount in paying checks. The ability to independently market for food and groceries also becomes compromised at this stage. Similarly, the ability to order food from a menu in a restaurant setting begins to be compromised. The dominant mood at this stage is frequently what psychiatrists term a flattening of affect and withdrawal. In other words, the patient often seems less emotionally responsive than previously. Although the patient is

aware of their deficits, this awareness of decreased intellectual capacity is too painful for most persons and, hence, the psychological defense mechanism known as denial, whereby the patient seeks to hide their deficit, even from themselves where possible, becomes operative. In this context, the flattening of effect occurs because the patient is fearful of revealing their deficits. Consequently, the patient withdraws from participation in activities such as conversations. In the absence of complicating medical pathology, the diagnosis of AD can be made with considerable certainty from the beginning of this stage. Studies indicate that the duration of this stage of mild AD is a mean of approximately 2 years. The characteristic functional change in this stage is incipient deficits in basic activities of daily life. Some patients begin to wear the same clothing day after day unless reminded to change. The spouse or other caregiver begins to counsel regarding the choice of clothing. The mean duration of this stage is 1. At this stage, deficits are of sufficient magnitude as to prevent independent, catastrophe-free, community survival. Patients can no longer manage on their own in the community. Very common reactions for persons at this stage who are not given adequate support are behavioral problems such as anger and suspiciousness. Cognitively, persons at this stage frequently cannot recall such major events and aspects of their current lives as the name of the current president, the weather conditions of the day, or their correct current address. Characteristically, some of these important aspects of current life are recalled, but not others. Also, the information is loosely held, so, for example, the patient may recall their correct address on certain occasions, but not others. Remote memory also suffers to the extent that persons may not recall the names of some of the schools which they attended for many years, and from which they graduated. Orientation may be compromised to the extent that the correct year may not be recalled. Calculation deficits are of such magnitude that an educated person has difficulty counting backward from 20 by 2s. Functionally, persons at this stage have incipient difficulties with basic activities of daily life. The characteristic deficit of this type is decreased ability to independently choose proper clothing. This stage lasts an average of approximately 1. In this stage, deficits are of sufficient magnitude as to prevent catastrophe-free, independent community survival. The spouse or other caregiver begins to counsel regarding the choice of clothing Figure 5. Functionally, five successive substages are identifiable. Initially, in stage 6a, patients, in addition to having lost the ability to choose their clothing without assistance, begin to require assistance in putting on their clothing properly. Unless supervised, patients may put their clothing on backward, they may have difficulty putting their arm in the correct sleeve, or they may dress themselves in the wrong sequence Figure 6. Generally, the earliest such deficit noted in this stage is decreased ability to put on clothing correctly without assistance. The total duration of the stage of moderately severe AD stage 6a through 6e is approximately 2. At approximately the same point in the evolution of AD, but generally, just a little later in the temporal sequence, patients lose the ability to bathe independently without assistance stage 6b. Characteristically, the earliest and most common deficit in bathing is difficulty adjusting the temperature of the bath water. Initially, once the spouse adjusts the temperature of the bath water, the patient can still potentially otherwise bathe independently. Subsequently, as this stage evolves, additional deficits in bathing independently as well as in dressing independently occur. In this 6b substage, patients generally develop deficits in other modalities of daily hygiene such as properly brushing their teeth independently. Stage 6b Figure 7 Requires assistance adjusting the temperature of the bath water. Stages 6c, 6d, 6e With the further evolution of AD, patients lose the ability to manage independently the mechanics of toileting correctly stage 6c. Unless supervised, patients may place the toilet tissue in the wrong place. Many patients will forget to flush the toilet properly. As the disease evolves in this stage, patients subsequently become incontinent. Generally, urinary incontinence occurs first stage 6d, then fecal incontinence occurs stage 6e. The incontinence can be treated, or even initially prevented entirely in many cases, by frequent toileting. Subsequently, strategies for managing incontinence, including appropriate bedding, absorbent undergarments, etc. Stage 6c Figure 8 Requires assistance with cleanliness in toileting Figure 8. Requires assistance to maintain continence Figure 9. Generally, urinary incontinence precedes fecal incontinence. Strategies to prevent episodes of incontinence include taking the patient to the restroom and supervision of toileting. In this sixth stage cognitive deficits are generally so severe that persons will display little or no knowledge when queried regarding such major aspects of their current life circumstances as their current address or the weather

conditions of the day. At the end of this stage, speech ability overtly breaks down. Recall of current events is generally deficient to the extent that the patient cannot name the current national head of state or other, similarly prominent newsworthy figures. Persons at this sixth stage will most often not be able to recall the names of any of the schools which they attended. They may, or may not, recall such basic life events as the names of their parents, their former occupation and the country in which they were born. They still have some knowledge of their own names; however, patients in this stage begin to confuse their spouse with their deceased parent and otherwise mistake the identity of persons, even close family members, in their own environment. Calculation ability is frequently so severely compromised at this stage that even well-educated patients had difficulty counting backward consecutively from 10 by 1s. Stage 6e Figure 10 Emotional changes generally become most overt and disturbing in this sixth stage of AD. Consequently, unless the appropriate direction is provided, patients begin to fidget, to pace, to move objects around and place items where they may not belong, or to manifest other forms of purposeless or inappropriate activities. Because patients can no longer survive independently, they commonly develop a fear of being left alone. Treatment of these and other behavioral and psychological symptoms which occur at this stage, as well as at other stages of AD, involves counseling regarding appropriate activities and the psychological impact of the illness upon the patient, as well as pharmacological interventions. The mean duration of this sixth stage of AD is approximately 2. As this stage comes to an end, the patient, who is doubly incontinent and needs assistance with dressing and bathing, begins to manifest overt breakdown in the ability to articulate speech. Six consecutive functional substages can be identified over the course of this final seventh stage. Early in this stage, speech has become so circumscribed, as to be limited to approximately a half-dozen intelligible words or fewer in the course of an intensive contact and attempt at an interview with numerous queries stage 7a.

Chapter 7 : Alzheimer's disease - Symptoms and causes - Mayo Clinic

Dementia refers to a category of diseases that cause loss of memory and deterioration in other mental functions. Dementia occurs due to physical changes in the brain and is a progressive disease.

This article has been cited by other articles in PMC. Neurofibrillary tangles are formed due to the hyperphosphorylation of tau protein. There is an urgent need to develop a reliable biomarker for the diagnosis of AD. Cerebrospinal fluid CSF is surrounding the brain and reflects the major neuropathological features in the AD brain. Diagnosis, disease progression and drug actions rely on the AD biomarkers. The levels of p-Tau were found to be increased in AD patients. The window period for the AD may be around 15 years before the onset of clinical symptoms. In the window period the disease process continues but both patient and clinician remain ignorant. Kandimalla et al. In western society and developing countries with the increasing life expectancy AD becomes one of the health problems in the elderly population. For promising therapeutics, it requires differential biomarker for the early detection of AD. Based on the Alois Alzheimer observations, there are differences in the dyed brain fibrils of a patient afflicted with dementia compared with fibrils in a normal brain. Thus, it is generally accepted that there are differences in the composition of neurofibrils. In AD brain tau protein accumulates in the form of hyperphosphorylated form. The determination of phosphorylated form of tau p-Tau may increase the specificity and sensitivity in the detection of AD in CSF as opposed to total tau. Blennow et al. In normal brain tau is responsible for the assembly and stability of the microtubules in the axons of neurons and in turn responsible for the neuronal plasticity. In human brain, tau exists in six different isoforms with alternatively spliced exons. The largest tau isoform has residues tau and four repeat domains with exon 10 spliced in and two extra domains from exons 2 and 3 whereas smallest contains amino acid residues and three repeat microtubule-binding domains. Blennow et al. Since then many studies have confirmed the increase of total CSF tau protein concentration in AD patients compared to controls. Kandimalla et al. Therefore, CSF p-Tau levels may be considered as potential biochemical marker for AD instead of CSF total tau levels, because it represents directly to the neuronal axon degeneration. **Materials and Methods** After approval of the local Ethics Committee, informed consent was obtained from each patient or their caregivers. Altogether 92 patients were enrolled over 3 years in four groups. **Exclusion criteria** The patients who were less than 50 years with AD, doubtful AD, AD overlapping with other dementias and with other neurological diseases were excluded from this group. **Exclusion criteria** The patients who were less than 50 years and with other neurological diseases were excluded in this group. **Neurological controls NC** **Inclusion criteria** Twenty three 23 NC group of either sex, above 50 years, with other neurological diseases for which dementia is not a component like polyneuropathy, motor neuron disease MND, demyelination, multiple sclerosis, amyotrophic lateral sclerosis ALS, Meningitis, encephalopathy, cervical myelopathy, sensory ataxia. **Exclusion criteria** Neurological diseases with dementia as a component, hyperthyroidism, cerebral palsy, psychomotor patients were excluded from this group. **Exclusion criteria** Patients with Diabetes, doubtful neurological disease and age less than 50 years were excluded from this group. The monoclonal antibodies which are coated on the ELISA plate recognize both the entire moiety and its fragments. Vanmechelen et al. The relation between the two variables was calculated using the chi square test.

Chapter 8 : The 7 Stages of Alzheimer's Disease | How Alzheimer's Progresses

The public health response to the Alzheimer's disease epidemic on a state and community level is addressed. The module describes the concept of a "dementia capable" system and explores how public health may support the development of such systems through public health research and translation, support services and programs, workforce.

Brain atrophy involves the loss of neurons. Some degree of atrophy and subsequent brain shrinkage is common with old age, even in people who are cognitively healthy. Many factors have been implicated in affecting the rate of brain atrophy, one of which is high levels of an amino acid in the blood called homocysteine. In a recent randomised controlled trial, researchers investigated the role of vitamin B in regulating levels of homocysteine. They specifically wanted to test whether lowering homocysteine through giving high doses of vitamin B for two years could reduce the rate of brain atrophy in people with pre-existing mild cognitive impairment. Volunteers aged 70 and older with concerns about their memory were recruited for this study. It was specified that volunteers should have a diagnosis of mild cognitive impairment (MCI), defined using specific criteria. These included a concern about memory that did not interfere with activities of daily living and pre-specified scores on some cognitive scales assessing word recall and fluency. The study excluded people with a diagnosis of dementia, who were taking anti-dementia drugs or who had active cancer. People taking folic acid and vitamin B6 or B12 above certain doses were also excluded. Every six months, the volunteers were randomly assigned to receive either high-dose oral vitamin B tablets or placebo. The participants, their partners and all staff directly involved in the study were unaware which pills participants were taking. MRI scans were performed at the start of the study and again after two years. The researchers used these scans to calculate the rate of brain atrophy each year. A total of 1000 people were randomly assigned a treatment, although 500 did not start the study. A similar proportion from each treatment group dropped out along the course of the study. The researchers measured adherence to the study treatments by counting returned tablets. For the main analysis of brain shrinkage, the researchers used data on 850 receiving active treatment and 850 receiving placebo who had completed an MRI at both the start and at follow-up. The analyses took into account a variety of factors that may be linked to brain atrophy or use of vitamin B, which the researchers had tested and found to be important. These factors were age, blood pressure, initial brain volume and concentration of homocysteine at the start of the study. Treatment with vitamin B tablets had notable effects on the levels of homocysteine in the blood, reducing it by 70%. Levels of homocysteine increased by 70% in the placebo group. Overall, treatment with B vitamins for a period of 24 months led to a reduction in the rate of brain atrophy. The effect was greater in people who were more compliant with taking their medication and in those who started with the highest levels of homocysteine. The researchers also found that, overall, the safety of vitamins was good with no adverse events. This was a well-conducted, albeit small, study. It was a randomized controlled trial, which is the most appropriate way to assess the effects of a new treatment. No study is perfect, though, and the researchers highlighted some shortcomings: The treatment was a combination of three B vitamins, so the researchers could not determine whether these have different effects individually. The study was not set up to assess the effects of treatment on cognition, but only on the rate of change in brain measurements. Based on the evidence gathered so far, it is too early to claim that vitamin B can prevent clinical disease, but these results are promising. It is also interesting to note that this is a major study that exemplifies the use of potential biomarkers such as imaging, in therapeutic trials for MCI and AD.

Chapter 9 : Alzheimer's disease - Wikipedia

Alzheimer's disease can last more than a decade. See what types of behaviors are common in each of the stages as the disease progresses. Alzheimer's disease tends to develop slowly and gradually worsens over several years. Eventually, Alzheimer's disease affects most areas of your brain. Memory.

You might also like these other newsletters: Please enter a valid email address Sign up Oops! Please enter a valid email address Oops! Please select a newsletter We respect your privacy. Dementia symptoms can range from mild memory loss to more severe cognitive difficulties that make it hard to manage daily activities without help. These symptoms are broadly grouped into categories called stages that help guide doctors and families in their care of dementia patients. Shah points out that people with dementia progress along the memory loss continuum in their own individual way, and often there is no clear-cut moment when you know that your loved one has moved from one stage to another. Becoming familiar with the stages of dementia, however, is still useful for giving care. This can help guide: The medications available to help control dementia symptoms have been studied in clinical trials during different stages of dementia. Not all medications are necessarily appropriate for your family member, depending on their specific symptoms and stage of dementia. The Stages of Dementia The stages of dementia are as follows: At this stage, there are no obvious signs of dementia and people are still able to function independently. Dementia signs are barely noticeable and simply appear to be the kind of forgetfulness associated with aging – such as misplacing keys but finding them again after some searching. Symptoms of dementia at this stage may include: Some forgetfulness and memory loss Repetition Losing items without being able to retrace steps to find them Slight trouble managing finances, such as balancing a checkbook Confusion while driving Trouble managing medications Loss of concentration Moderate. Other dementia symptoms during this stage include: Trouble holding urine incontinence Increase in memory loss and forgetfulness Inability to use or find the right words and phrases Difficulty doing challenging mental math exercises, such as counting backwards from by 7 Increase in social withdrawal Moderately severe. At this stage, dementia patients will need some assistance with their day-to-day activities. Symptoms of moderately-severe dementia include: Increase in memory loss, including inability to remember home address, phone number, or other personal details Confusion about location or chain of events Trouble with less challenging mental math exercises Needing help to select appropriate clothing for the climate, season, or occasion Severe. Dementia signs at the severe stage include: Needing help to get dressed Requiring help with toileting , such as wiping and flushing Wandering and becoming lost if not supervised Inability to recall the names of family members or caregivers, but still being able to recognize familiar faces Sleep disturbances Changes in personality or behavior, such as increased paranoia or even hallucinations Very severe. This is the final stage of the disease. Symptoms of dementia during this stage include: These questions may include some mental tests. One frequently used screening tool is called the Mini-Mental State Examination, an question exam that can help pinpoint cognitive decline on a scale of 0 to