

Risk factors in dementia

Introduction

Dementia is a complex condition. Many factors influence an individual's risk of developing dementia. We cannot change some of these factors, like our age and our genetic makeup. But lifestyle factors are also linked to the risk of dementia, and this information sheet looks at the possible influence of these lifestyle factors as well.

Several key risk factors for dementia have been identified:

- Ageing
- Genetics
- Medical history, particularly cardiovascular
- problems
- Lifestyle and environment.

There is no single straightforward cause of dementia, and no way of definitely preventing it, but it may be possible for each of us to reduce our risk or at least delay the onset of dementia.

Ageing

Dementia is an illness, not a normal part of growing older. Even at a very advanced age, most people do not have dementia.

However, age is the biggest risk factor for dementia and, the older you become, the more likely you are to develop dementia. Dementia affects about 2% of people aged 65 to 70, 5% of people aged 70 to 80, about 20% over 80 and 33% over 90.

Genetics

The term 'dementia' covers the effects of a range of diseases – Alzheimer's disease, vascular dementia, Dementia with Lewy bodies, etc. Many of these diseases are likely to have a genetic basis, but for most forms of dementia this is not a straightforward single gene.

Most of the research on the genetics of dementia is about Alzheimer's disease. However, there are known genes that contribute to some of the risk factors for vascular dementia, such as high cholesterol levels, high blood pressure and diabetes.

Does dementia run in families?

You may think that because dementia has cropped up in your family several times over recent generations that you are likely to develop it too and there must be something in your genes that causes this.

The vast majority of cases of dementia are not caused by an inherited genetic fault. Dementia is so common that having one or two close relatives with dementia, in itself, is not evidence of a family link. Having a close family member with Alzheimer's disease does increase your risk, but only by a small amount.

Familial Alzheimer's disease

There are rare types of Alzheimer's disease where there is a family link caused by a single defective gene. This is called familial Alzheimer's disease, and usually affects people under the age of 65. So far, three

different genes of this kind have been identified.

Only a very few families worldwide are affected by each gene and most cases of early onset Alzheimer's disease are not inherited in this way. On average, half of the children of someone with one of these rare genetic defects will inherit the disease.

ApoE

Researchers have identified a protein called apolipoprotein E (ApoE) which affects your chances of developing Alzheimer's disease. There are three forms of ApoE: ApoE2, ApoE3 and ApoE4.

Having one or two copies of ApoE4 increases someone's chance of developing the disease, but does not make it certain. Some people with one or two copies of ApoE4 never develop Alzheimer's disease, and others who develop Alzheimer's disease do not have ApoE4.

One or two copies of ApoE3 are associated with an average risk, and the risk of developing Alzheimer's disease for people with two copies of ApoE2 is reduced.

Some researchers think that ApoE4 does not affect whether a person will get the disease but, rather, when they get it, causing people with ApoE4 to develop the disease before people with ApoE2.

Down's syndrome

People with Down's syndrome are now living longer and are at particular risk of developing Alzheimer's disease at an earlier age than usual. Estimates suggest that more than 50% of people with Down's syndrome in the 50-59 age group have dementia.

Huntington's disease

Huntington's disease is a progressive hereditary disease caused by a particular gene. The symptoms of Huntington's disease usually develop when people are 30-50 years old, although they can start

much earlier or much later and can vary from person to person, even in the same family. The course of the disease also varies for each person and dementia can occur at any stage.

Each person whose parent has Huntington's disease is born with a 50-50 chance of inheriting the faulty gene. Anyone who inherits the faulty gene will, at some stage, develop the disease.

For more detailed information about genetics and dementia, see our information sheet IS 35 Genetics and dementia. www.alzscot.org/pages/info/geneticsanddementia.htm

Medical history, particularly cardiovascular problems

Conditions that affect the heart and blood circulation are particularly important for the risk of developing vascular dementia. High blood pressure, high cholesterol levels, diabetes, heart attacks, strokes and mini-strokes can all affect blood supply to the brain, leading to possible damage. Obesity in mid-life may also increase the risk of developing dementia.

There is mounting evidence that risk factors for one type of dementia may also relate to other dementias. For example, having high blood pressure in middle age is a risk factor for both vascular dementia and Alzheimer's disease, so lifestyle changes and/or medical treatment to lower blood pressure may help to prevent both these kinds of dementia, as well as mixed dementia where someone has both types.

Parkinson's disease

Not all people with Parkinson's experience dementia but it does occur in 15-30% of cases.¹

¹ Parkinson's Disease Society (2009). Dementia and Parkinson's. (Information sheet)

Lifestyle and environment

Dementia is something we tend not to think about in our 40s and 50s unless we know someone close to us who has the disease. Many people are already aware that their lifestyle - for example diet and exercise - can affect their risk of heart disease. The evidence is growing that the same factors also affect dementia risk.

This section looks at the main lifestyle and environmental factors which have been linked to dementia.

Diet

A brain-healthy diet is one that reduces the risk of heart disease and diabetes, encourages good blood flow to the brain, and is low in fat and cholesterol.

Does healthy eating reduce the risk of dementia?

The simple answer is that we don't really know for sure. The evidence is stronger for vascular dementia where a healthy diet can help reduce the risk of high blood pressure, heart disease, high cholesterol and diabetes, all risk factors for vascular dementia.

The evidence is less clear-cut for Alzheimer's disease, although it points the same way. Several studies suggest that maintaining a healthy body weight is also important, with obese people having a greater risk of developing dementia.

Physical activity

Physical activity is not just good for your body - it's also good for your brain. It is still not clear exactly why this is the case but it's likely to be something to do with improving the blood flow to the brain, which may in turn help the brain carry out its function. Getting your heart pumping and your circulation going increases blood flow, which carries nutrients and oxygen to the brain. It also helps reduce the risk of heart

attack, stroke and diabetes, which are all risk factors for dementia.

Does physical activity reduce the risk of dementia?

While the evidence is encouraging, it is not conclusive. Although physical activity does not prevent dementia, there is starting to be evidence that points towards it reducing the risk or possibly delaying the onset of the illness.

Some large scale, long term studies have suggested that people who exercise regularly have a reduced risk of developing dementia compared with people who exercise less often or not at all.

It doesn't have to be strenuous exercise. One study found that older men who walked more than two miles a day had nearly half the risk of dementia compared with those who walked less than quarter of a mile a day.

Smoking

Some small scale research studies in the past suggested that nicotine may boost the functioning of neurotransmitters in the brain known to be damaged by Alzheimer's disease. Even if this is the case, any beneficial effect is likely to be short lived. In the long term, smoking is likely to increase the risk of dementia by damaging the blood vessels which supply essential nutrients to the brain.

More recent research has shown that smoking is a significant risk factor for vascular dementia and Alzheimer's disease, with smokers twice as likely to develop the disease as non smokers.

Alcohol consumption

People who drink moderately may have a lower risk of dementia. However, too much alcohol can lead to alcohol related brain damage and severe loss of short-term memory.

Mental activity

Brain size and education level

It has been suggested that more intelligent, better educated people possibly have more brain cells and connections between brain cells in reserve – so that even if some are destroyed there are more left to work with. This is generally described as 'cognitive reserve'.

Cognitive reserve has also been suggested as the reason why some people don't show any signs of dementia while others with the same amount of brain damage do.

When some people's brains have been examined after death, they have shown significant amounts of plaques and tangles which would suggest that they must have had Alzheimer's disease, yet they apparently showed no symptoms. To explain this, researchers have suggested that the brains of such people must be able to compensate for the damage in some way.

Some research has suggested that people with larger brains are less likely to develop dementia but others say that it's how they use their brains that matters.

The concept of cognitive reserve is controversial. Some may say that it is just common sense – if you have a bigger brain, or more brain cells and more connections between cells, is it not obvious that any damage your brain receives will have less impact? However, even if cognitive reserve helps to compensate, it still doesn't mean that an individual will not develop dementia.

Keeping mentally active

Some studies suggest that people who take part in mentally stimulating activities, through their work, their education or their social life, have a lower risk developing dementia.

Activities that need mental energy, such as reading, learning languages or a musical instrument, playing board games, doing crosswords or Sudoku puzzles and playing games such as bingo or bridge, may have a protective effect.

We don't know for sure but it is possible that such activities stimulate more brain cell connections. That might mean that if brain cells are damaged, the brain can keep working well for much longer, and the person may not show symptoms of dementia.

Social activity

There is some evidence that people who have limited interaction with other people may be more likely to develop dementia when compared to those with more active social lives.

Activities which combine mental, physical and social stimulation may be even better for reducing the risk of dementia, such as day or evening classes, walking with a group or taking part in community groups.

Head injury

Head injury, particularly more severe or repeated injury, is regarded as a risk factor in the development of Alzheimer's disease and other forms of dementia later on in a person's life. It is thought that deposits may form in the brain as a result of head injury and this may increase the risk of dementia.

Boxing has been associated with a dementia called 'punch drunk syndrome' and the heading of old style leather footballs was considered a risk factor for brain damage.

Not everyone with a head injury goes onto develop dementia. However, taking steps to avoid head injury is advisable, such as wearing a seatbelt when travelling in a vehicle, and using protective head gear when riding, cycling and playing sports.

Stress and depression

There is no evidence that stress is responsible for causing dementia. People who are stressed can show some of the signs of dementia such as forgetfulness or confusion but these problems are likely to disappear if the source of the stress is removed or a stressful situation improved.

People with serious depression can have problems with memory, concentration and attention. This can create a syndrome known as “pseudodementia” where the symptoms can look like dementia, and can be misdiagnosed as Alzheimer’s disease or some other form of dementia. If depression is diagnosed, it can be treated and the dementia-like symptoms will improve or disappear.

It is known that people can have both dementia and depression, but it is not clear whether one condition leads to the other. Research published in 2010² suggested that depression may be linked with an increased risk of developing dementia. But there is much more research needed to find out how the two are linked.

Hormones

Hormone replacement therapy (HRT) provides extra oestrogen to top up a woman’s natural supply, which diminishes with age.

Observational studies have suggested that women using HRT have a reduced risk of developing dementia. It is thought that HRT may help by reducing the amount of a damaging protein called beta amyloid. Another possibility is that HRT may help the brain cope with illness and also top up neurotransmitters damaged in dementia.

There have been mixed results from research. There may be good reasons for a woman to take HRT to treat menopausal symptoms but, based on existing evidence, HRT should not be taken solely for any benefit it may have for the brain. HRT has been associated with a small but increased

risk of stroke and the development of some cancers.

Aluminium

Much of the evidence linking aluminium to Alzheimer’s disease is circumstantial. Aluminium in large quantities is shown to have a toxic effect on the nervous system. It has also been shown to be associated with both the plaques and tangles in brains of people with Alzheimer’s disease, but this does not prove that it is a cause of Alzheimer’s disease.

Based on current knowledge the majority of medical and scientific opinion is that exposure to aluminium is not a significant risk factor. Most older people do not get Alzheimer’s disease despite the widespread presence of aluminium in the environment.

How can I reduce my risk of developing dementia?

There is no single thing that should be done but an individual is most likely to see the benefit of:

- eating healthily
- taking moderate exercise
- keeping up social networks
- exercising the brain.

Four more tips to reduce your risk of dementia:

Go for regular health checks

Get your blood pressure and cholesterol levels checked at least once every five years and more often if necessary. Early prevention could prevent problems later in life.

²Saczynski, J S et al. Depressive symptoms and risk of dementia: The Framingham Heart Study Neurology July 6, 2010 75:35-41

Stop smoking

Smoking affects your circulation and may increase dementia risk.

Maintain a healthy body weight

People who are obese are considerably more likely to develop dementia later in life than people with a normal body weight.

Drink alcohol only in moderation

If you drink, don't exceed the weekly maximum of 14 units of alcohol for women and 21 units for men. A unit is, for example, a small glass of wine, a single measure of spirits or half a pint of ordinary strength beer or lager.

Doing these things will not mean you can definitely avoid dementia but they may reduce your risk considerably. A healthier lifestyle will have the added benefit of improving your health and wellbeing generally.

Further information

Alzheimer Scotland. IS 33. Healthy living with dementia. [Information sheet]
www.alzscot.org/pages/info/healthyliving.htm

Alzheimer Scotland. Good for you – good for your brain: the evidence on risk reduction and dementia. 2006.
www.alzscot.org/pages/info/riskreductionbooklet.htm

Alzheimer Scotland. Dementia – how to reduce your risk. 2007.
www.alzscot.org/pages/riskreduction.htm



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