



Healthcare
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Scotland

SHTG
Advice on health
technologies

FDG-PET imaging in the diagnosis of dementia

Plain language summary | December 2024

What is dementia?

Dementia is a brain condition that can affect memory, thinking, mental agility, language, understanding and emotions. Dementia affects different parts of the brain over time. It can affect people physically and change the way the brain processes senses such as sight and taste.

What is an FDG-PET scan?

PET stands for positron emission tomography. PET scans are imaging tests that are used to diagnose disease by showing the build-up of radioactive tracers in certain parts of the body. The radioactive tracers are normally given to a patient by an injection.

FDG stands for fluorodeoxyglucose. FDG is a type of radioactive tracer used in PET scans. FDG is taken up by the body in the same way as glucose (a type of sugar that is the body's main source of energy). FDG-PET brain scans detect and map how the brain is taking up FDG. If uptake is decreased, it indicates that the brain is not using energy as it should, and possible neurodegeneration (a loss of neurons in the brain).

Why is this important?

There are over 100 kinds of dementia (known as subtypes). The most common are Alzheimer's disease, vascular dementia, mixed dementia, dementia with Lewy bodies and frontotemporal dementia. In Scotland, it is estimated that there are around 90,000 people living with dementia. However, many people are living with dementia but are undiagnosed.

In order to get a diagnosis of dementia, patients may need to undergo several tests and assessments. If someone is diagnosed with dementia, doctors will often also try to diagnose the subtype of dementia that they have. This is important because although the different subtypes of dementia can have similar symptoms, the treatments that are offered to patients may be different.

An FDG-PET scan may be useful for some people with dementia, for whom the subtype of dementia is not clear. However, FDG-PET scans are not readily available in Scotland for people with dementia. Instead, people in this position are normally offered a different type of scan, called a SPECT scan. SPECT stands for single-photon emission computed tomography. SPECT scans are more readily available in Scotland. We have been asked to assess how FDG-PET scans compare to SPECT scans in this group of patients.

What we did

We looked for studies that assessed how accurate FDG-PET scans and SPECT scans are for people who have a diagnosis of dementia, but in whom it is not clear what subtype of dementia they have. We also considered other factors such as costs, the experience and perspectives of patients and their carers, and the practicalities of offering people an FDG-PET scan rather than a SPECT scan.

What we found

We identified several studies on the use of FDG-PET and SPECT scans for people with dementia. Together these suggest that FDG-PET scans are more accurate, compared with SPECT scans, in people undergoing assessment for dementia. However, the studies were variable in quality, and differences between them made it hard to compare the results. More research would allow more confident conclusions.

What is our conclusion?

In people who have undergone standard assessment for dementia, further investigations should only be used if clarifying dementia subtype would change the treatment that patients are offered. Either a SPECT scan or an FDG-PET scan should be considered as a further investigation for clarifying dementia subtype in people with suspected Alzheimer's disease or frontotemporal dementia.

What next?

This work will inform the National PET-CT Review Group decision as to whether an FDG-PET dementia imaging service should be developed as part of a potential PET-CT service expansion in NHSScotland.

This plain language summary has been produced based on SHTG Recommendation: FDG-PET imaging in the diagnosis of dementia