Malignant brain tumors: Benefit of PET and PET/CT in the detection of recurrences is not assessable

EurekAlert

Malignant gliomas are fast-growing brain tumours with poor prospects of recovery depending on disease stage. Experts hope that the examination of patients by means of positron emission tomography (PET) is more helpful in the choice of the right treatment than other procedures. In a final report the German Institute for Quality and Efficiency in Health Care (IQWiG) has now investigated the benefit of PET in the detection of recurrences. According to this report, no robust conclusions are possible on the advantages or disadvantages of PET.

Two research questions investigated

The Institute investigated two research questions:

First question: Does PET as a single device or as a combination of PET and computer tomography (CT) in one device (PET/CT) contribute to patients with recurrence of glioma surviving longer or experiencing fewer complications caused by their disease or treatment? This question could not be answered by IQWiG, as no robust study was found in the literature allowing any conclusions on the patient-relevant (additional) benefit of this intervention.

The Institute also investigated a second question: Can recurrence of glioma after treatment be detected more accurately with PET or PET/CT than with other methods? Twelve studies on PET conducted over a period of two decades were identified; however, the results for this procedure differed so substantially between studies that no general answer could be provided. Not a single study on PET/CT was found.

This lack of good studies is regrettable. PET has been applied in studies investigating patients with brain tumours since the early eighties; there would have been enough time to conduct meaningful studies. IQWiG therefore advocates that these missing studies be conducted as quickly as possible. As gliomas are relatively rare, ideally several hospitals should cooperate on an international level in order to obtain robust data within a reasonable period of time.

How does PET work?

CT and magnetic resonance imaging (MRI), also referred to as magnet resonance tomography (MRT), are procedures used to diagnose brain tumours. These devices can depict whole organs in a three-dimensional manner. If a patient with a brain tumour is treated with radiotherapy, it is often not possible to distinguish on images of the brain whether the visible residuals represent active cancer tissue or tissue

residuals destroyed by radiation (radiation necroses).

PET is supposed to help solve this problem. For this purpose, patients are injected a contrast agent that emits weak and non-toxic radiation. As tumour tissue often has a more active metabolism than healthy or necrotic tissue, the radioactive contrast agent accumulates there. This "illuminating" tissue in the body can be measured by means of PET and blended into CT images, so that doctors can see the location and metabolic activity of any tissue abnormalities at the same time. In newer studies, PET and MRI are also combined.

Even if the PET examination provided more information, this would not necessarily mean that patients would benefit from it. The decisive question is whether PET or PET/CT improves the treatment of patients by, for example, helping doctors choose the best treatment for the individual patient.

SOURCE [1]

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