

EANM PRESS RELEASE

Prostate cancer: molecular imaging techniques improve diagnosis and disease management

(Vienna, 4 July 2012) Approximately every second prostate cancer patient who has his prostate surgically removed or has undergone radiation therapy suffers from relapse. Routinely used biochemical tests give early warning but provide no information about the sites and the extent of the recurrent cancer. “Recent findings show that molecular imaging techniques fill this gap and allow for a precise planning of the most appropriate treatment,” says Prof. Bernd Krause, expert of the European Association of Nuclear Medicine (EANM).

Prostate cancer is the second most frequently diagnosed cancer and the sixth leading cause of cancer death in males worldwide. As applies to all tumour patients in general, follow-up examinations at regular intervals after the treatment has been finished are essential. In approximately one half of the patients who have undergone surgery or radiation therapy prostate cancer recurs within ten years after primary therapy. About 50% of these patients develop a local tumour while the others develop metastases, sometimes combined with local tumour recurrence. For follow-up examinations PSA tests have proven useful and are state of the art. They measure the concentration of the prostate-specific antigen (PSA) – a protein found in the prostate tissue – in the serum. If a certain level is exceeded, this indicates the recurrence of the disease. Such an increase can precede a clinically detectable tumour by months or even years. “Thus, PSA tests provide an efficient early-warning system, but PSA measurement can neither reveal the extent and location of the tumour nor whether it has metastasised,” says EANM expert Prof. Bernd Krause (University of Rostock, Germany).

PET/CT provides urgently needed information

This information can be provided by molecular imaging techniques as recent studies show. In particular, the combination of positron emission tomography (PET), which spots cancerous cells by making visible their metabolism through tracers (radioactively labelled substances), and computed tomography (CT), which uses X-rays to deliver cross-sectional anatomical images, has proven very useful. “In order to detect, define and assess recurrent prostate cancer at an early stage, PET/CT is an important means as it can precisely localise tumours as well as detect and characterise associated lymph node and bone metastases in many patients. Such information is crucial for efficient therapy planning and disease management,” says Prof. Krause. The PET tracers best suited at the present time for imaging of recurrent prostate cancer are based on choline, a molecule which is part of the human metabolism as well as of the nervous system.

With PET/CT being so helpful in the detection of recurrent prostate cancer, why is it not routinely used for primary prostate cancer diagnosis, too? In fact, several studies have already tackled this issue, but with somewhat mixed results as Prof. Krause points out. One

major reason is that primary prostate tumours are often small (“micro-carcinoma”) and partly “rind-like”, therefore presenting configurations which, due to technological restrictions, PET/CT and imaging modalities in general are not always able to detect. However, ongoing research indicates that upcoming scientific and technological development might strengthen the role of imaging methods in primary prostate cancer diagnosis in the future.

Large potential for improvement

Meanwhile, the emphasis lies on further exploiting the imaging techniques’ large diagnostic potential concerning cancer relapse. While choline-based PET/CT is state of the art, the combination of PET and magnetic resonance imaging (MRI) – which makes use of magnetic and radio frequency fields – might be the technique of tomorrow. “The combined use of these techniques delivers synergistic information because the sensitive molecular information provided by PET is completed by excellent soft-tissue contrast through MRI, which makes the latter an excellent imaging method for the assessment of bone marrow and the detection of bone metastases at early stages. In any case, the future is very likely to lie in hybrid scanners such as PET/CT and PET/MRI,” says Prof. Krause. Another approach to increase the accuracy of prostate cancer diagnosis focuses on the development of novel, more sensitive and more specific tracers suited for prostate tissue and other affected body regions. “Although we have to await the results of ongoing studies, it can safely be assumed that this is a very promising aspect of further improvement of molecular imaging as these tracers could be used with PET/CT as well as with PET/MRI,” says Prof. Krause.

For an animated introduction to nuclear medicine, please visit the website
www.whatisnuclearmedicine.com

Press contact

impresum health & science communication
Robin Jeganathan
Haus der Seefahrt, Hohe Brücke 1
20459 Hamburg, Germany
Email: jeganathan@impresum.de
Tel: +49 (0)40 – 31 78 64 10
Fax: +49 (0)40 – 31 78 64 64