Imaging tests for the detection of osteomyelitis: a systematic review

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Plain English summary

Osteomyelitis is an infection of the bone and is treated with antibiotics. Left untreated, it can cause permanent damage and can lead to amputation.

The best method to diagnose osteomyelitis is to take a bone sample (bone biopsy) but this is invasive and painful. Imaging may help target the best locations for biopsies or remove the need for a biopsy entirely. Several methods are available, including radiography, ultrasound, magnetic resonance imaging (MRI), single-photon emission computed tomography (SPECT) and positron emission tomography (PET).

This project systematically reviewed the relevant literature to determine which tests are the most accurate and relevant for clinical practice. All types of patients and all types of osteomyelitis were reviewed. Studies were pooled using statistical methods (meta-analyses) to estimate the overall accuracy of the imaging tests.

The review identified 81 studies and concluded that MRI, PET and SPECT all had similar accuracy, correctly identifying over 85% of people who did have osteomyelitis and over 80% of people who did not have osteomyelitis. Radiography and computed tomography were less accurate. Modern forms of scintigraphy have accuracy similar to PET or MRI.

There was no evidence that the accuracy of the imaging tests was different depending on the cause of osteomyelitis or which body part was affected. In particular, diagnostic accuracy in people with diabetic foot ulcers was similar to other types of osteomyelitis in adults. There was not enough evidence about which tests are most accurate in children, so further studies in children are needed.
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The journal is indexed in NHS Evidence via its abstracts included in MEDLINE and its Technology Assessment Reports inform National Institute for Health and Care Excellence (NICE) guidance. HTA research is also an important source of evidence for National Screening Committee (NSC) policy decisions.

This report

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