Following NICE guidelines in imaging of diabetic foot ulcers; Are we there yet?

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BACKGROUND

Delay in diagnosis and management of osteomyelitis (OM) in diabetic foot ulcer increases morbidity and rate of amputation.

NICE guideline on imaging of suspected diabetic foot infection:1 If osteomyelitis is suspected and initial X-ray does not confirm the presence of osteomyelitis, use magnetic resonance imaging (MRI). If MRI is contraindicated, white blood cell (WBC) scanning may be performed instead.

Do not exclude osteomyelitis on the basis of X-rays alone. X-rays should be used for alternative diagnoses, such as Charcot arthropathy.

AIM

• To find out how often an MRI was requested to investigate the presence of OM in diabetic foot ulcer:
  • As the initial investigation
  • After a normal or abnormal plain radiograph
  • To identify the time taken to request and perform an MRI.

METHOD

Using word search we identified 880 investigations related to osteomyelitis on our institution’s radiology information system (CRIS) between January 2013 and April 2014. From these 125 studies (75 outpatients and 50 inpatients) patients were selected with diabetes & foot ulcers.

We looked to see if an initial X-ray was followed up by an MRI or plain film.

CONCLUSION

The gold standard for diagnosing osteomyelitis remains the combination of microbiological culture and histopathological examination of bone. The reported sensitivity of plain radiography in diagnosing OM ranges from 28 to 75%.

Repeating and comparing foot X-rays over time is more likely to detect OM than a single series. MRI is considered the best available technique not only for diagnosing OM but also for better visualizing deep soft tissue infection or sinus tracts.

With the inherent lower sensitivity of plain films in diagnosing osteomyelitis more patients with normal X-rays will benefit from an MRI. Do not delay starting antibiotic therapy for suspected osteomyelitis pending the results of the MRI scan.

RESULTS

MRI was done for 21/50 (42%) inpatients, 4 as the first investigation (2 showed OM), 10 following a normal initial X-ray (2 showed OM) and 7 after a suspicious or diagnostic plain film for OM (5 showed OM). Only 11/75 (15%) outpatients had an MRI, 4 with normal X-rays (2 OM on MRI) and 7 with abnormal X-rays (4 OM on MRI).

13 OM diagnosed on X-ray were followed up by plain films only. 24 normal inpatient X-rays were not followed up.

On average MRI was requested 2.5 days after X-ray and performed 5.2 days later.

References:

i. National Institute for Care and Health Excellence, Diabetic foot problems: Inpatient management of diabetic foot problems, NICE guidelines [CG119] Published date: March 2011

ii. Lipsky B. et al. 2012 Infectious Diseases Society of America Clinical Practice Guideline for the Diagnosis and Treatment of Diabetic Foot Infections, CID 2012:54

iii. Uckay I. et al. Diabetic foot infections: state-of-the-art, Diabetes, Obesity and Metabolism 2013