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Academic Emergency Medicine Volume 23, issue 11, 1298-1306.

Point-of-care Ultrasound for Diagnosis of Abscess in Skin and Soft Tissue Infections.

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Primary care physicians, Urgent Care physicians and Emergency Medicine Physicians rely on clinical examination with soft tissue and skin infections to differentiate between cellulitis and an abscess. Equivocal exam or misdiagnosis will lead to unnecessary incision and drainage or failed antibiotic therapy if an abscess is present. This systematic review assesses the diagnostic utility of point of care ultrasound to identify an abscess in skin and soft tissue infections.

Methods

A systematic search of Medline, Web of Science, EMBASE, CINAHL, and Cochrane Library databases from inception until May 2015 was done.

Trials comparing point of care ultrasound with clinical examination to identify abscesses when evaluating skin and soft tissue infections in the ED were included.

The presence of an abscess was defined by drainage of pus.

The absence of an abscess was defined as no pus drainage upon incision and drainage or resolution of skin and soft tissue infections without pus drainage at follow-up.

Quality of trials was assessed using the QUADAS-2 tool.

Operating characteristics were reported as sensitivity, specificity, positive likelihood ratio (LR+), and negative likelihood ratio (LR-), with their respective 95% confidence intervals (CI).

Summary measures were calculated by generating a hierarchical summary receiver operating characteristic (HSROC) model.

Trials that included intraoral abscesses or abscess drainage in the operating room were excluded.

Results

3,203 references were identified

Six observational studies (four pediatric trials and two adult trials) with a total of 800 patients were included.

Two trials compared clinical examination with clinical examination plus point of care ultrasound.

Four trials directly compared clinical examination to point of care ultrasound.

The point of care ultrasound hierarchical summary receiver operating characteristic revealed a sensitivity of 97% (95% CI = 94% to 98%), specificity of 83% (95% CI = 75% to 88%), LR+ of 5.5 (95% CI = 3.7 to 8.2), and LR- of 0.04 (95% CI = 0.02 to 0.08).

Limitations

All 6 trials were observational trials

Differential verification bias; all 6 studies used drainage of purulent material in ED or at follow up as standard for an abscess. It is unclear how physicians classified abscesses smaller than 1 cm with point of care ultrasound. A small abscess could have been classified as cellulitis and progressed to an abscess or resolved on follow up.

Skin and soft tissue infections are a spectrum; infections initially may have only been cellulitis, but progressed to an abscess on follow up.

Discussion

Despite the limitations of the 6 observational trials, ultrasound can help guide the diagnosis and treatment of soft tissue skin infections. There is no potential harm with performing point of care ultrasound and the only negative would be the increased time it takes.
