Pyogenic vertebral osteomyelitis

Pyogenic vertebral osteomyelitis is a neurological and life threatening condition. It encompasses a broad range of clinical entities, including pyogenic spondylodiscitis, septic discitis, vertebral osteomyelitis, and epidural abscess.

Differences between the characteristics of culture positive pyogenic spondylitis and tuberculous spondylitis (TS) are well known.

Epidemiology

The incidence though low appears to be on the rise.

Diagnosis

The diagnosis is based on clinical, radiological, blood and tissue cultures and histopathological findings.

Treatment

Pyogenic vertebral osteomyelitis treatment

Case series

Seventy-four patients diagnosed with PVO underwent clinical assessment for therapeutic responses based on clinical features during antibiotic therapy. The decisions of the clinical assessment were confirmed as 'Cured' or 'Non-cured'. FDG-PETs were conducted concomitantly regardless of the decision at each clinical assessment. We developed DNN models depending on the use of attributes, including C-reactive protein (CRP), erythrocyte sedimentation ratio (ESR), and maximum standardized FDG uptake values of PVO lesions (SUVmax), and we compared their performances to predict PVO remission. Results: The 126 decisions (80 'Cured' and 46 'Non-cured' patients) were randomly assigned with training and test sets (7:3). We trained DNN models using a training set and evaluated their performances for a test set. DNN model 1 had an accuracy of 76.3% and an area under the receiver operating characteristic curve (AUC) of 0.768 [95% confidence interval, 0.625-0.910] using CRP and ESR, and these values were 79% and 0.804 [0.674-0.933] for DNN model 2 using ESR and SUVmax, 86.8% and 0.851 [0.726-0.976] for DNN model 3 using CRP and SUVmax, and 89.5% and 0.902 [0.804-0.999] for DNN model 4 using ESR, CRP, and SUVmax, respectively. Conclusions: The DNN models using SUVmax showed better performances when predicting the remission of PVO compared to CRP and ESR. The best performance was obtained in the DNN model using all attributes, including CRP, ESR, and SUVmax, which may be helpful for predicting the accurate remission of PVO [1].

[1)]

Shin H, Kong E, Yu D, Choi GS, Jeon I. Assessment of Therapeutic Responses Using a Deep Neural Network Based on 18F-FDG PET and Blood Inflammatory Markers in Pyogenic Vertebral Osteomyelitis. Medicina (Kaunas). 2022 Nov 21;58(11):1693. doi: 10.3390/medicina58111693. PMID: 36422232; PMCID: PMC9698865.

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