The validity of high-resolution computer tomography in predicting active pulmonary tuberculosis of elderly man at emergency department

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Purpose

This study evaluates the use of high-resolution computed tomography (HRCT) to differentiate active pulmonary tuberculosis (PTB) of elderly patients from other pulmonary infections (PI) in the emergency room (ER).

Methods and Materials

Three hundred and eighty-nine patients diagnosed with PI in an ER were divided into an derivation (DG-G1 and G2) and validation groups (VG-G3 and G4). The DG and VG divided into PTB (G1=163, G3=102) and other PI (G2=63, G4=61). HRCT images from a 64-MDCT scanner were analyzed, retrospectively, for the morphology, number, and segmental distribution of any lesions.

Results

Utilizing multivariate analysis, five variables were found to be independent risk factors predictive of G1 and G3: 1) consolidations in the apex segment (S1), posterior segment (S2) of the right upper lobe (RUL), apicoposterior segment (S1+2) of the LUL ($p<0.001$), cavitations of the S1, S2 of the RUL, S1+2 of the LUL ($p=0.002$) and tree in bud ($p<0.001$) were independently significant factors that were predictive for active PTB. 2) The consolidation of right or left lower lobes and fibrosis were more frequently found in PI ($p<0.05$) had an independently negative predictive value for the active PTB. A prediction score was generated based on these 5 criteria to help differentiate G1 from G2 and G3 from G4. The area under the receiver operating characteristic (ROC) curve was (0.918±0.012, 0.915±0.012) respectively. With an ideal cut-off point score of 1, the sensitivity, specificity, positive predictive value, and negative predictive value were (81.6%, 85.7%), (93.1%, 78.7%), (95.0%, 80.6%), (76.0.0%, 84.4%) respectively.

Conclusion

The use of this active PTB prediction model based on 5 key HRCT findings may help ER physicians determine whether or not isolation is required while awaiting serial sputum culture results in high risk elderly patients.
References


**Personal Information**

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