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PREDICTIVE VALUES OF THE WELLS AND REVISED GENEVA SCORES COMBINED WITH D-DIMER FOR SUSPECTED PULMONARY EMBOLISM IN ELDERLY PATIENTS

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Objectives To compare the predictive values of the Wells and revised Geneva scores combined with D-dimer for suspected pulmonary embolism (PE) in elderly patients, and to explore suitable and simple predictive approaches for PE in elderly patients.

Methods 336 patients who were admitted for suspected PE due to chest pain, dyspnoea, syncope, and haemoptysis were enrolled between January 2006 and April 2011, and they were divided into two groups based on the age >=65 or <65 years. The main clinical presentation and medical history of patients was recorded, with plasma D-dimer tested and CT pulmonary arteriography performed. The analyses were done as follows: Firstly, the clinical characteristics of the cases of two groups were compared. Secondly, the Wells and revised Geneva scores defined as possible PE for Wells

scores>4, and impossible PE for the scores <=applied to evaluate the diagnostic possibility of PE, and the positive predictive value of both scores were calculated with CTPA as gold standard. The area under the curve of ROC were compared to assess the predictive value of both scores for suspected PE in elderly patients. And thirdly, the negative predictive value of the test results of the Wells and revised Geneva scores combined with D-dimer were calculated.

Results 9 cases (28.6%) were definitely diagnosed by CTPA among the 336 cases admitted for suspected PE (196 aged older than 65, and 140 aged <65), among which 56 cases (58.3%) were older than 65, and 40 (41.7%) were <65. Clinical characteristics of both groups were compared, and heart rate and respiration rate of the elderly patients were higher than that of the non-elderly (heart rate: 95.04±19.00 vs 85.90±13.69 beats per minute, $p<0.05$; respiration rate: 20.52±3.71 vs 18.93±2.14 breaths per minute, $p<0.05$), and with arterial oxygen saturation lower than that of the non-elderly (92.74±6.21 vs 95.62±3.95%, $p<0.05$). The positive predictive value of Wells and revised Geneva scores were 65.8%, 32.4% ($p<0.05$) in the elderly patients, and 65.6%, 32.4% ($p=0.21$) in the non-elderly patients. The negative predictive value of D-dimer, the Wells score combined with D-dimer, and the revised Geneva score combined with D-dimer were 93.7%, 100%, and 100%, respectively, in the elderly patients.

Conclusions Heart rate and respiration rate of the elderly cases with PE were higher than those of the non-elderly, with arterial oxygen saturation lower than that of the non-elderly. Different from the non-elderly cases, the predictive value of the Wells score was higher than the revised Geneva score for the elderly cases with suspected PE, and using of the Wells score could reduce the rate of misdiagnosis. The combination of either the Wells score or the revised Geneva score and a normal D-dimer concentration is a safe strategy to rule out PE and could reduce the number of unnecessary scans for the elderly cases with suspected PE.