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CHEST

Reply to Letter to the Editor re: Magnetic resonance imaging of pulmonary nodules: accuracy in a granulomatous disease-endemic region

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Dear Editor,

We thank Drs. Shen and Kuang [1] for their interest in our recent publication in *European Radiology* [2]. The aim of our study was to estimate the diagnostic accuracy of signal intensity of the lesion-to-spinal cord ratio (LSR) and apparent diffusion coefficient (ADC) in diffusion-weighted magnetic resonance imaging (DWI) of pulmonary nodules suspicious for lung cancer in granulomatous lung disease-endemic regions. We conclude that DWI can help to differentiate malignant from benign lesions according to ADC and the LSR with good accuracy.

We would like to apologise for the mistakes in the calculations presented in the *Results* sub-section*, ROC findings,* as pointed out by Drs. Shen and Kuang. Table 1 shows results for the diagnostic capability of ADC and LSR. The corrected values are: with a cut-off value of 1.08×10^{-3}mm^2/s, the ADC had a positive predictive value of 90.63%, a negative predictive value of 88.24%, a sensitivity of 93.55%, a specificity of 83.33% and an accuracy of 89.8% in the detection of lung cancer. With a cut-off value of 1.20×10^{-3} mm^2/s, the LSR had a positive predictive value of 94.12%, a sensitivity of 96.77%, a specificity of 88.89% and an accuracy of 93.9% for the detection of lung cancer. These differences do not compromise the accuracy of our article.

According to the current literature [3–5], DWI can help to differentiate malignant from benign lesions based on qualitative, quantitative, (like ADC) and semiquantitative (like LSR) parameters. In our study, both LSR and ADC have an accuracy of at least 93.9%.

We were particularly interested in the comments regarding advanced models of DWI. Recently, advanced models of DWI have been proposed to better understand the behaviour of water motion in the different tissues. Broncano et al. [6] expressed that the intravoxel incoherent motion (IVIM) model of diffusion signal decay has been shown to have a better fit than monoexponential analysis. IVIM-derived parameters are, theoretically, more reliable markers of tissue diffusivity than ADC and can separate both compartments of diffusion signal decay. In addition, ADC assumes a Gaussian diffusion behaviour, which does not always exactly fit the real signal decay of the diffusion signal. Diffusional kurtosis imaging (DKI) quantifies the deviation of tissue diffusion from a Gaussian pattern by measuring diffusion with ultra-high b values greater than 1,500 s/mm^2. IVIM and DKI models have been recently explored in the evaluation of chest malignancies and show some promise over conventional ADC measurements. However, Koyama et al. [7] found significantly higher specificity and accuracy of LSR compared with ADC- and IVIM-derived parameters in the differentiation of benign and malignant pulmonary nodules. In our study, the diagnostic capability of ADC did not differ significantly from that of LSR, but LSR calculation is more useful and practical than ADC calculation. We conclude that these advanced models of DWI may be promising, but more studies are needed before they can be incorporated into routine clinical practice.

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