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Value of non-contrast MR imaging with diffusion-weighted imaging for detection of primary small (≤20 mm) solid pancreatic tumors and prediction of pancreatic ductal adenocarcinoma

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Aim of this study is to determine the diagnostic performance of noncontrast MRI with diffusion-weighted imaging (DWI) (NonMRI) for detection of primary small (<20mm) pancreatic solid tumor and prediction of pancreas ductal adenocarcinoma (PDAC) in comparison with pancreas CT (PanCT) and pancreas MRI with MR cholangiopancreatography (PanMRI). The institutional review board approved this retrospective study and waived the requirement for informed consent. A total of 126 patients who underwent PanCT and PanMRI, including 94 small (<20 mm) pancreatic tumors (51 PDACs, 34 neuroendocrine tumors [NETs], 9 solid pseudopapillary tumors [SPTs]), and 32 patients with normal pancreas, comprised study population. Two observers assessed three sets of images: PanCT, PanMRI and NonMRI (T1- and T2-weighted images and DWI). ROC curve analysis, diagnostic accuracy (area under the receiver operating characteristic curve [Az]) were used for statistical analysis. On NonMRI and PanMRI, all of tumors except one NET were detected, but eight tumors (6 NETs, 1 PDAC, 1 SPT) were not detected on PanCT ($P < 0.01$). For prediction of PDAC, the Az value of the NonMRI (0.884 for observer 1; 0.930 for observer 2) was comparable with PanCT (0.922; 0.924) ($P > 0.05$), and inferior to PanMRI (0.930; 0.977) ($P < 0.05$), but all of 51 PDACs were considered as probable or definite PDAC on NonMRI by both observers. In conclusions, NonMRI showed better performance than PanCT, and competitive performance to PanMRI for detection of primary small solid pancreatic tumors, and showed reasonable sensitivity for prediction of PDACs compared with PanCT and PanMRI.

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