Supplementary Information

Title: Value of machine learning model based on superb microvascular imaging ultrasound radiomics in noninvasive assessment of chronic kidney disease

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Clinical and color Doppler indicators

The clinical indicators included: 1, sex, 2, age, 3, systolic blood pressure, 4, diastolic blood pressure, 5, RBC, 6, WBC, 7, HGB, 8, alt, 9, AST, 10, CRE, 11, UA, 12, eGFR, 13, ure, 14, IgM, 15, PLT, 16, neut, 17, ALP, 18, GGT, 19, TP, 20, ALB, 21, LDH, 22, TC, 23, TG, 24, IgG, 25, IgA, 26, C3, 27, urinary protein, 28, 24-hour urinary protein

The included color Doppler ultrasound indicators include: 1. Kidney length: the length of the target kidney measured in the maximum longitudinal section; 2. Kidney width: the width of the target kidney measured at the maximum longitudinal section; 3. Renal cortical thickness: the cortical thickness of the target kidney measured in the maximum longitudinal section; 4. Renal cortical echo: the renal cortical echo was compared with the liver / spleen echo. The normal renal cortical echo was defined as the renal echo was lower than the liver / spleen echo. The enhanced renal cortical echo was defined as the echo of the renal cortex was equal to or stronger than the echo of the liver / spleen parenchyma. The renal cortical echo intensity was divided into the enhanced renal cortical echo and the normal renal cortical echo; 5. Peak systolic velocity (PSV) of the main renal artery (MRA): images were obtained in color Doppler and pulse Doppler modes. The ultrasound probe was gently positioned in the flank in the form of oblique projection, and the kidney was visualized as a longitudinal image. The Doppler sampling volume was placed on the trunk of the renal artery of the target kidney, and the PSV of MRA was measured; 6. RI of MRA: the RI of MRA is calculated according to the peak systolic velocity (PSV) and end diastolic velocity (EDV) of the main renal artery measured for an average of 2-3 times, ri= (psv-edv) /psv; 7. The PSV of segmental renal artery (SRA) was obtained from two to three representative proximal PSVs of the target kidney (the first vascular

branch of MRA), and the PSV of SRA was obtained; 8. RI of SRA: the RI of SRA is obtained by measuring PSV and EDV of SRA for an average of 2-3 times.

Univariate analysis

Univariate analysis: gender (p=0.01), age (p=0.042), systolic blood pressure (p=0.000), diastolic blood pressure (p=0.000), kidney length (p=0.011), cortical thickness (p=0.063), main flow velocity (p=0.000), segment flow velocity (p=0.001), segment RI (p=0.012), RBC (p=0.004), WBC (p=0.064), HGB (p=0.011), ALT (p=0.021), AST (p=0.031), CRE (p=0.000), UA (p=0 034), eGFR (P =0. 000), urea (P = 0. 000), IgM (P = 0. 099) and chronic degree were statistically significant

Kidney width (p=0.428), trunk RI (p=0.105), cortical echo (p=0.814), PLT (p=0.578), neut (p=0.102), ALP (p=0.524), GGT (p=0.860), TP (p=0.737), ALB (p=0.603), LDH (p=0.336), TC (p=0.226), TG (p=0.414), IgG (p=0.296), IgA (p=0.172), C3 (p=0.733), urinary protein (p=0.664), 24-hour urine protein (P = 0. 630) and chronic degree had no statistical significance

Multivariate analysis

After multivariate analysis, gender (p=0.01) and eGFR (p=0.001) were independent predictors, among which Age (p=0.58), systolic blood pressure (p=0.173), diastolic blood pressure (p=0.215), kidney length (p=0.763), cortical thickness (p=0.111), main flow velocity (p=0.536), segment flow velocity (p=0.505), segment RI (p=0.675), RBC (p=0.107), WBC (p=0.110), HGB (p=0.448), ALT (p=0.083), AST (p=0.446), CRE (p=0.251), UA (p=0.634), urea (p=0.172), IgM (P = 0. 297) and chronic degree had no statistical significance.