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The association between low serum cholinesterase and renal function decline in patients

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Objectives : To explore the association between serum cholinesterase levels and renal function.
Methods : This study retrospectively collected 172,764 patients over 18 years of age with renal function and liver function data from Guangdong Provincial People's Hospital from January 2020 to June 2020. The liver function index included serum cholinesterase, glutamic pyruvic transaminase(ALT), glutamic oxaloacetic transaminase(AST), total Bilirubin(TBil), Direct Bilirubin(DBil), and Total Protein(TP). Cases with a decrease in cholinesterase were excluded if accompanied by abnormalities in other indicators of liver function. The final 96447 cases were divided into 5 groups based on different levels of estimated glomerular filtration rate(e GFR), which is referred to the stage of chronic kidney disease in KDIGO. Serum cholinesterase were compared among the 5 groups by using the Kruskal-Wallis test. The data were processed by SPSS 26.0 software and R, and Pearson's correlation and ROC curve analysis was performed.
Results : According to the Kruskal-Wallis test, there was a significant difference in serum cholinesterase levels among the five groups of patients with different eGFR levels (P=0.000), as well as the Pearson correlation analyse a correlation coefficient of 0.947 between eGFR and serum cholinesterase. Serum cholinesterase levels in patients with eGFR<15 (5239.74±1901.863) were significantly lower than those in patients with ≥eGFR15 (7372.81±2082.489), with a statistical difference (P=0.000).The ROC curve of serum cholinesterase diagnosis of patients with eGFR<15, the area under the curve was 0.788, and the optimal Cut-off value was 6389.50 U/L.
Conclusions : These findings suggest that lower serum cholinesterase (even in the normal range) is associated with renal function decline, especially when eGFR less than 15, indicating serum cholinesterase might be a kidney dysfunction biomarker