

Abstract Submission No.: A-1062**Identification of two novel phenotypes in membranous lupus nephritis patients****Wang Zhipeng**, Ruihan Tang, Xi Xia, Wei Chen

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Objectives : Membranous lupus nephritis (MLN) patients were traditionally classified into three subtypes including class V, class V+III and class V+IV based on the 2003 International Society of Nephrology/Renal Pathology Society (ISN/RPS) classification, the clinical and treatment value of which remains controversial.

Methods : A total of 412 membranous lupus nephritis (MLN) patients from the First Affiliated Hospital of Sun-Yat Sen University (1st January 1996 to 15th July 2023) were enrolled retrospectively. Unsupervised analysis (including Kmeans, Principal component analysis and decision tree analysis) were utilized to identify and validate novel phenotypes.

Results : Compared to the traditional three classifications by ISN/RPS, a new method for clustering MLN patients resulted in two clusters with more distinct features and outcomes (17.9% and 5.7% adverse renal events rate for high-risk and low-risk group, P value<0.001). Meanwhile, new clusters intuitively separate the MLN patients based on many other clinical features beyond fundamental pathologic characteristics. The high-risk cluster (consisting of 72.6% class V+IV MLN patients) has severe clinical indicators and poorer prognosis than the low-risk cluster (consisting of 68.9% class V MLN patients). However, class V+III MLN patients overlap the distribution both in the high-risk group (accounting for 14.9%) and the low-risk group (accounting for 25.0%). Therefore, decision tree analysis was then used to summarize nine variables (systemic lupus erythematosus duration, SLEDAI score, leukocytopenia, serum creatine, serum albumin, pathological classification, chronic index, glomerular crescent percentage, and glomerular cellular crescent percentage), which guide MLN patients into their appropriate clusters with 84.68% accuracy in our cohort, especially for class V+III MLN patients.

Conclusions : This study identifies two novel phenotypic clusters surpassing three traditional classifications, which may contribute to more efficient clinical decisions and prognostic prediction.