P-110

루푸스 신장염에서 생검된 조직에 포함된 개별 사구체의 조직학적 특징을 이용하여 전체 신장의 병리를 추정하는 방법

한양대학교 병리학교실[1], 건양대학교병원 병리과[2]

송영수[1], 민경환[1], 전영진[1], 장기석[1], 박문향[2]

Approaches to Estimation of Organ-Level Pathology from Individual Glomerular Histology in Lupus Nephritis

Young Soo Song[1], Kyueng-Whan Min[1], Young Jin Jun[1], Ki-Seok Jang[1], Moon Hyang Park[2]

Department of Pathology[1], College of Medicine, Hanyang University
Department of Pathology[2], Konyang University Hospital

Kidney pathology is generally assessed in a qualitative rather than quantitative manner from renal biopsies. In lupus nephritis, quantification requires two processes: 1) synthesising information from individual glomerular histology to define sample-level pathology, 2) estimation of errors between sample-level and organ-level pathology. Examples of pathology in this context include the ISN/RPS 2003 classification, and the diversity of glomerular histology. To facilitate the process, we developed criteria for classifying individual glomeruli into seven types, which can be used to reconstruct the ISN/RPS classification. Using our glomerular classification, we were able to obtain the proportions of each type of glomerulus in each sample. To estimate inconsistencies between the ISN/RPS classes in a biopsy sample and the whole organ, we developed a class inconsistency rate (CIR) using bootstrapping. To quantify the diversity of glomerular histology, we developed a measure of glomerular diversity (GD) using a diversity index. The features of CIR and GD and their use for defining organ-level pathology were evaluated. CIR (15.80 ± 40.03%) increased when the number of biopsied glomeruli was low and the sample was intermediate between different classes. GD was larger in classes IV-G and V than in classes III and IV-S. Serum creatinine levels were higher in the middle-range of GD in class IV-G samples. In simulations, the GD of samples differed from those of the whole organ when low numbers of glomeruli were sampled, but converged to their true values when large numbers of glomeruli were sampled. We conclude that CIR can distinguish between cases whose classification on the ISN/RPS classification is secure from ones whose classification is less secure and GD can add to the information on the pathologic state of the kidney obtained from the ISN/RPS classification. Our procedures should be applicable to other renal pathologies.

Key Words: 루푸스 신장염, 사구체 조직학, 정량 분석
Lupus nephritis, Glomerular histology, Quantitative analysis