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Interobserver Agreement Analysis Among Renal Pathologists In Classification Of Lupus Nephritis Using Digital Pathology Image Dataset: After Third Evaluation

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Objectives : Lupus nephritis is well known for its low concordance in classification. Furthermore, there has been no agreement analysis among Korean renal pathologists regarding lupus nephritis. Inconsistent diagnosis leads to confusion and increased medical costs, as well as the failure of appropriate therapeutic interventions. This study aims to assess the agreement among Korean renal pathologists in the classification and make efforts to improve it.
Methods : Representative glomerular images diagnosed as lupus nephritis were gathered from five hospitals. A total of 25 questions were formulated, each including four images of a glomerulus stained with H&E, PAS, trichrome, and PAMS. Multiple-choice responses were provided for 14 options consisting of characteristic histologic findings in lupus nephritis. The survey was conducted among members of The Renal Pathology Study Group of the Korean Society of Pathologists. Three rounds of surveys were conducted, and educational sessions were held before the second and third surveys.
Results : The agreement was calculated using Fleiss kappa. The average of Fleiss kappa for each questions were as follows: the first 0.42 (minimum 0.18, maximum 0.61), the second 0.42 (0.19, 0.64), and the third 0.47 (0.23, 0.65). Although the agreement after 1st education showed no significant difference compared to the initial agreement (P=0.95), the agreement after the 2nd education significantly increased compared to the initial agreement (P=0.0009). The agreement for each item generally increased on average with each education session, but there was no statistical significance (P=0.46, 0.17). Additionally, the ranking of agreements for each item remained relatively consistent. "Cellular crescent" and "wire loop/hyaline thrombi" maintained high agreement of 0.6 or above, while "mesangial hypercellularity", "fibrous crescent", and "double contour" consistently showed low agreement below 0.2 in all three surveys.
Conclusions : The overall agreement increased after two times of education. However, some items remained to have inconsistent diagnosis.