SIGNIFICANCE STATEMENT

Steroid-sensitive nephrotic syndrome (SSNS) is a major glomerular disease classification, albeit descriptive in nature. One locus in the *HLA-DQA1* coding region was identified by exome chip. To gain further insights, we performed transethnic GWAS in children from two European cohorts (NEPHROVIR and ItSpa) and integrative analysis in NEPTUNE. Three independent SNPs, all implicated in other immune-related diseases, were identified: two in the *HLA-DR/DQ* region and one in the *BTNL2-HCG23-LOC101929163* region. The lead risk allele was associated with decreased HLA transcript expression across tissues, including glomeruli. Increased burden of *HLA-D* risk alleles was associated with increased disease odds, younger onset, and increased odds of complete remission across histologic diagnoses. These results provide clues to immune dysregulation in SSNS and define a genomic subtype.