Background and aims High dose corticosteroids and cyclophosphamide are commonly used to treat LN. Although effective in preventing end stage renal disease (ESRD) in most cases, significant long-term side effects such as infections, increased risk of malignancy, and infertility are common and are related to the duration of therapy or the cumulative dose of medications. There are currently no markers that can reliably determine response or refractoriness to treatment at an individual level. MicroRNAs are small, non-coding RNAs responsible for post-transcriptional regulation, have been shown to have altered expression levels in a variety of diseases suggesting their potential use as biomarkers. We propose miRNAs can be predictive markers for response to cyclophosphamide.

Methods RNA was isolated and analysed via TaqMan Array MicroRNA 384 well Cards, from formalin-fixed paraffin embedded (FFPE) renal biopsies of two cohorts of patients with LN who were subsequently treated with cyclophosphamide with at least 2 years of follow up history. Patients who responded to cyclophosphamide based on urinalysis criteria of no active urinary sediments, no RBCs or WBCs in urine, and proteinuria less than 1 gram were classified as responders while those that did not fit the criteria were classified as non-responders. Significantly differentially expressed miRNAs, determined via \( 2^{\Delta \Delta Ct} \) method, from the first cohort were validated by the second cohort.

Results Six significantly up-regulated miRNAs, has-miR-30c-2-3p, has-miR-29b-1-5p, has-miR-195-3p, has-miR-424-3p, has-miR-1260a, and has-miR-1248 were found in responders. Conclusions These miRNAs may act as prognostic markers of renal outcomes and treatment response, which can establish a more personalised treatment of lupus nephritis in the future.