NU Rounds

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Dear Doctor,

Greetings from Micro Labs limited. We are happy to bring you "NU Rounds" which contains latest and interesting news in the field of Nephrology and Urology.

Inside This Issue:

1. **Chronic renal illness alters the size and electrophoretic mobility of HDL subpopulation particles.**
2. **A retrospective analysis from a single facility evaluated the effectiveness of cystoprostatectomy in patients with prostate cancer that had progressed to bladder.**
3. **Comparison of SuperPulsed Thulium Fiber Laser with Low-Power Holmium:YAG Laser Results in Pediatric Ureteroscopy**
4. **A Case Report on of membranous nephropathy with the Gitelman syndrome**

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback

Best Regards,

Medical Team, Micro Labs Ltd

NU Rounds

Vol 3 | Issue 33 | 2022

Nephrology and Urology

1.Chronic renal illness alters the size and electrophoretic mobility of HDL subpopulation particles.

Introduction:

Chronic kidney disease (CKD) patients have an increased risk of mortality from atherosclerosis-related complications such myocardial infarction and stroke, as well as heart failure (HF) and lethal arrhythmias, especially in advanced stages of the disease.[1] Chronic renal disease also alters the metabolism of high-density lipoprotein (HDL), a heterogeneous group of particles having anti-atherogenic characteristics (CKD).[2] This study's objective was to assess the HDL subpopulations' mobility and particle size in non-dialysis CKD patients.

The size and mobility of HDL particles are impacted by chronic kidney disease, which may be associated to HDL dysfunction.

Methods:

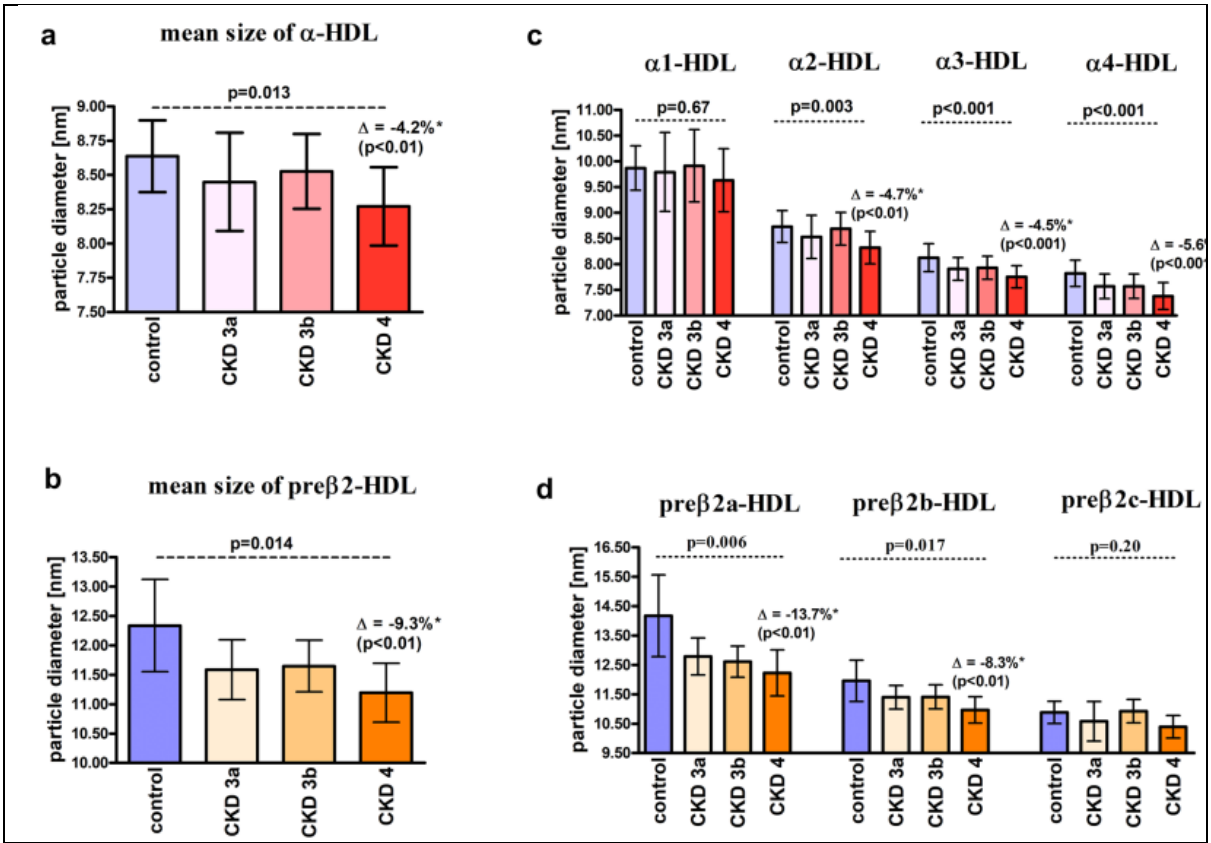
The study involved 60 adult participants: 18 non-CKD participants served as the control group and 42 patients with stage 3a to 4 CKD were treated conservatively at the University Clinical Center . In a total of 42 non-dialysis CKD patients (stages 3a–4) and 18 control patients participated in the study. Eight HDL subpopulations, pre-1, pre-2a-c, and 1-4, were identified by non-denaturing two-dimensional polyacrylamide gradient gel electrophoresis (2D-PAGGE). In addition to doing a regression analysis, the size and electrophoretic mobility of HDL subpopulation particles were examined between the groups.

Results:

In contrast to the control group, CKD patients had significantly smaller mean -HDL and pre2-HDL particle sizes (8.42±0.32 nm vs. 8.64±0.26 nm; 11.45±0.51 vs. 12.340.78 nm, p=0.003; respectively). In contrast to the control group, CKD patients had significantly higher electrophoretic mobility of pre-2-HDL in comparison to -HDL (Rf 0.65±0.06 vs. 0.53±0.10, p=0.002). eGFR levels and HDL subpopulation size and mobility were associated (p<0.01). After considering age, gender, statin use, apolipoprotein AI, total cholesterol, and triglyceride levels, these correlations were still statistically significant.

Discussion:

In this investigation, researchers describe alterations in HDL subpopulation size and mobility in non-dialysis CKD patients. In CKD patients compared to controls, researchers discovered that the mean size of HDL particles with α- and preβ2 mobility was much smaller and the relative pre2-HDL mobility was significantly higher. Additionally, researchers discovered that the extent of these changes varied for various HDL subpopulations and depending on the stage of CKD.[2] The mean HDL particle size was also shown to be smaller in CKD patients, but the studies' findings are conflicting. Larger HDL particles were associated with decreased CVD risk, according to the NMR study, which found that patients with eGFR45 mL/min/1.73 m2 had significantly smaller mean HDL particle sizes than those with eGFR>60 mL/min/1.73 m2.[3]



HDL particle sizes for the CKD patients and control group. a the mean size of α-HDL particles; b the mean size of preβ2-HDL particles; c the sizes of α-HDL subpopulations; d the sizes of preβ2- subpopulations. Data is presented as mean±SD; p—ANOVA test, *vs. control group (with post hoc test p value in brackets

Conclusion:

HDL dysfunction may be connected to CKD's effects on the size and mobility of HDL particles. The degree of HDL size and mobility alterations varied for each HDL subpopulation and depending on the stage of CKD, suggesting that particular stages of HDL metabolism may be more adversely affected by the presence of chronic renal disease.

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NU Rounds

Vol 3 | Issue 33 | 2022

Nephrology and Urology

2.A retrospective analysis from a single facility evaluated the effectiveness of cystoprostatectomy in patients with prostate cancer that had progressed to bladder.

Introduction:

The most frequent malignancy among men worldwide is prostate cancer. Locally advanced prostate cancer (LAPC) is defined as prostate cancer that has spread beyond the prostate capsule without distant metastases. [1] According to the most recent categorization method described in the European Association of Urology guidelines, prostate cancer that has invaded the bladder is classified as clinical T4 stage and locally advanced prostate cancer (LAPCa). In the lack of strong evidence, no research have yet determined the best course of treatment. [2] Additionally, LAPC is linked to biological recurrence, metastatic progression, and poor survival. For carefully chosen LAPC patients with bladder invasion, cystoprostatectomy may be an alternative to surgery as part of multimodal therapy. This may help to improve the patients' symptoms and quality of life in general.[1] This study examined the effects of cystoprostatectomy (CP), a treatment for prostate cancer (PCa) that has spread to the bladder, to see how it affected patient quality of life (QoL) and survival rates.

Patients with locally advanced prostate cancer and bladder invasion responded effectively to cystoprostatectomy which improved their quality of life and alleviated their local symptoms.

Methods:

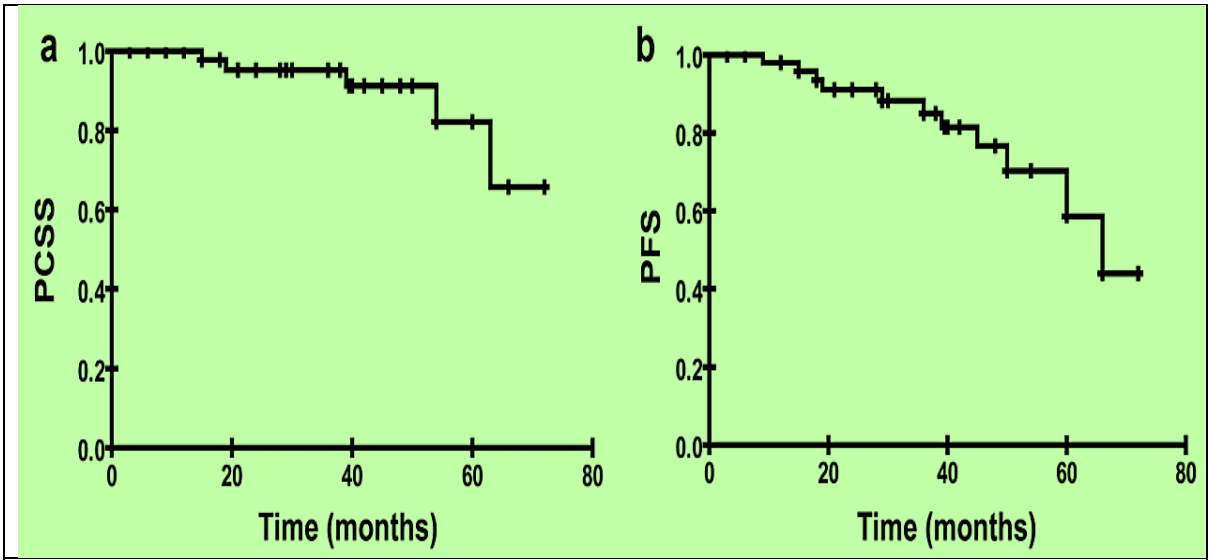
In the hospital, 27 PCa patients with bladder involvement had CP and underwent routine follow-up examinations. Age, PSA, Gleason score, bone scan, chest x-ray, pelvic MRI results, pelvic symptoms (hematuria, obstructive voiding symptoms, pelvic discomfort, hydronephrosis, and indwelling tubes), and quality of life (QoL) were all basic pathophysiologic parameters that were documented for all patients. Following a two-year period of three-monthly visits, all patients were evaluated for PSA and pelvic symptoms at six-monthly intervals. Analysis was done on PCSS and PSA recurrence-free survival (PFS). By using Kaplan-Meier analysis, the prostatic cancer-specific survival (PCSS) and prostate-specific antigen recurrence-free survival (PFS) were evaluated. A multivariate Cox regression analysis was done to assess the clinical traits that predicted survivals. Also assessed were QoL and pelvic symptom severity.

Results:

The median PCSS was not reached during the follow-up period. PCSS rate over five years was 82.1%. PFS was 66.0 months on average. 58.5% of PFS throughout a 5-year period. Gleason score of 8 (hazard ratio: 2.55, 95% confidence interval: 1.28–4.04, p=0.033), positive local lymph node status (hazard ratio: 3.52, 95% CI: 1.57–7.38, p=0.006), and bladder muscle invasion (hazard ratio: 4.75, 95% CI: 1.37–7.53, p<0.001) were all found to be independent predictors of worse PCSS in multivariate analysis. After operations, the number of patients with pelvic discomfort significantly dropped, and QoL scores significantly improved.

Discussion:

The significantly lower QoL scores following operations indicated that CP may have contributed to the improvement of quality of life in patients with PCa that has spread to the bladder. Furthermore, consistent with a prior report, these findings indicated the function of CP in alleviating pelvic symptoms, particularly in ceasing tube dependence.[2] In LAPCa patients with bladder invasion, our investigation confirmed the hypothesis that CP gave effective and long-lasting palliation, enhancing QoL and minimising local symptoms. Similarly , the recent review by Yaun et al. indicates that cystoprostatectomy reduces symptoms and enhances quality of life for LAPC patients.[1] Palliative cystoprostatectomy is a therapy option for advanced symptomatic prostate cancer, according to the research done by Surcel C et al.[3]



Survival analyses were assessed by Kaplan–Meier analysis. a Median PCSS was not reached over the period of follow-up. PCSS at 5-year was 82.1%. b Median PFS was 66.0 months. 5-year PFS rate was 58.5%

Conclusion:

The findings of this study supported the idea that CP offered effective and long-lasting palliation in LAPCa patients with bladder invasion, improving QoL and reducing local symptoms. Gleason score ≥8, local lymph node status of N1, and muscular invasion of the bladder wall were independent indicators of a worse outcome in these patients who underwent CP, according to the summary of all cases.

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3.Comparison of SuperPulsed Thulium Fiber Laser with Low-Power Holmium:YAG Laser Results in Pediatric Ureteroscopy

Introduction:

Recent developments have made the SuperPulsed Thulium fibre laser available to urologists. For the purpose of laser lithotripsy, it can be used on patients safely and effectively. This cutting-edge technique, in particular, solves the major drawbacks of Holmium:YAG lasers, which had previously been the main energy source for lithotripsy.[1] The thulium fibre laser is a promising new lithoptripsy device that has never been researched in children. The SuperPulsed thulium fibre laser was the first platform selected by the facility in North America (SPTF). [2] Researchers sought to evaluate the SPTF's performance in paediatric ureteroscopy to that of the gold-standard, low-power holmium:yttrium-aluminum-garnet (Ho:YAG) laser.

Compared to the low-power Ho:YAG laser, the SPTF laser had a better stone-free rate while maintaining safety and operating time.

Methods:

As an early user of the SPTF, from 2016 to 2021, paediatric patients underwent unilateral ureteroscopy with laser lithotripsy in the context of this retrospective, consecutive cohort study. Logistic regression was used to examine 30-day complications and stone-free status, which was determined by the absence of a stone fragment on follow-up imaging within 90 days. Utilizing linear regression, operational periods were contrasted. In order to account for any cohort imbalance, propensity values for SPTF use were used in regression analysis.

Results:

109 paediatric patients had 125 procedures altogether, 93 of which used Ho:YAG and 32 of which used SPTF. Age (p=0.2), gender (p=0.6), stone burden (p > 0.9), and stone location (p=0.1) were all unremarkable. 62% of patients were stone-free overall, compared to 70% with SPTF and 59% with Ho:YAG. In comparison to Ho:YAG, SPTF significantly reduced the likelihood of a remaining stone fragment (OR=0.39, 95% CI: 0.19-0.77, p=0.01). Operative time did not change significantly (p=0.8). Complications were detected with SPTF in seven cases (25%) and Ho:YAG in 19 cases (22%) (p=0.6).

Discussion:

The results of paediatric ureteroscopy performed with the SPTF were compared to those performed with the gold standard, low-power holmium:yttrium-aluminum-garnet (Ho:YAG) laser in this study. Longer surgical times are linked to higher complication rates, hence operating time is still a crucial factor for ureteroscopies. There was no discernible difference

between the laser groups in this cohort's median operating time of 83.5 minutes. The average operating duration, was significantly longer than the first adult SPTF.[3] With a reported 23% complication rate and no intraoperative complications and no significant difference between the 2 laser groups. This rate is high compared to several other series with complication rates of 10% or less. Researchers did, however, include flank discomfort necessitating immediate medical treatment as a complication, unlike many other series. Only 1 of the 26 problems in this sample needed surgery, while 17 of the 26 complications were due to symptomatic flank discomfort that necessitated emergency department examination. Urosepsis, a serious consequence necessitating a hospitalisation in an intensive care unit , was the only other major problem. Although it followed a case using the SPTF laser, this issue was not thought to be brought on by the laser itself.[2]

	Overall		Ho:YAG		SPTF	
No. location stone-free/total No. (%):	57/92	(62)	41/69	(59)	16/23	(70)
Ureteral only	32/34	(94)	28/30	(93)	4/4	(100)
Renal only, no lower pole stone	5/14	(36)	2/9	(22)	3/5	(60)
Renal only, lower pole stone	7/24	(29)	5/19	(26)	2/5	(40)
Ureteral+renal, no lower pole stone	3/5	(60)	1/2	(50)	2/3	(67)
Ureteral+renal, lower pole stone	10/15	(67)	5/9	(56)	5/6	(83)
No. complications/total No. (%)	26/114	(23)	19/86	(22)	7/28	(25)
No. Clavien-Dindo grade/total No. (%):						
I	15/114	(13)	11/86	(13)	4/28	(14)
II	9/114	(8)	7/86	(8)	2/28	(7)
≥III	2/114	(2)	1/86	(2)	1/28	(4)
Median mins operative time (IQR)	83.5 (67.0, 104.5)		84.0 (67.3, 102.8)		78.0 (65.8, 109.8)	

Stone-free rate(SFR) by stone location, complications and operative time with results from weighted regression analyses

Conclusion:

When treating young patients with urolithiasis, the SPTF laser employing TFL technology is a good substitute for the low-power Ho:YAG laser. SPTF usage was connected to a greater SFR after a single ureteroscopic surgery. While this technology was being used, the operating times and complication rates were not higher.

References:

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NU Rounds

Vol 3 | Issue 33 | 2022

Nephrology and Urology

4.A Case Report on of membranous nephropathy with the Gitelman syndrome

Introduction:

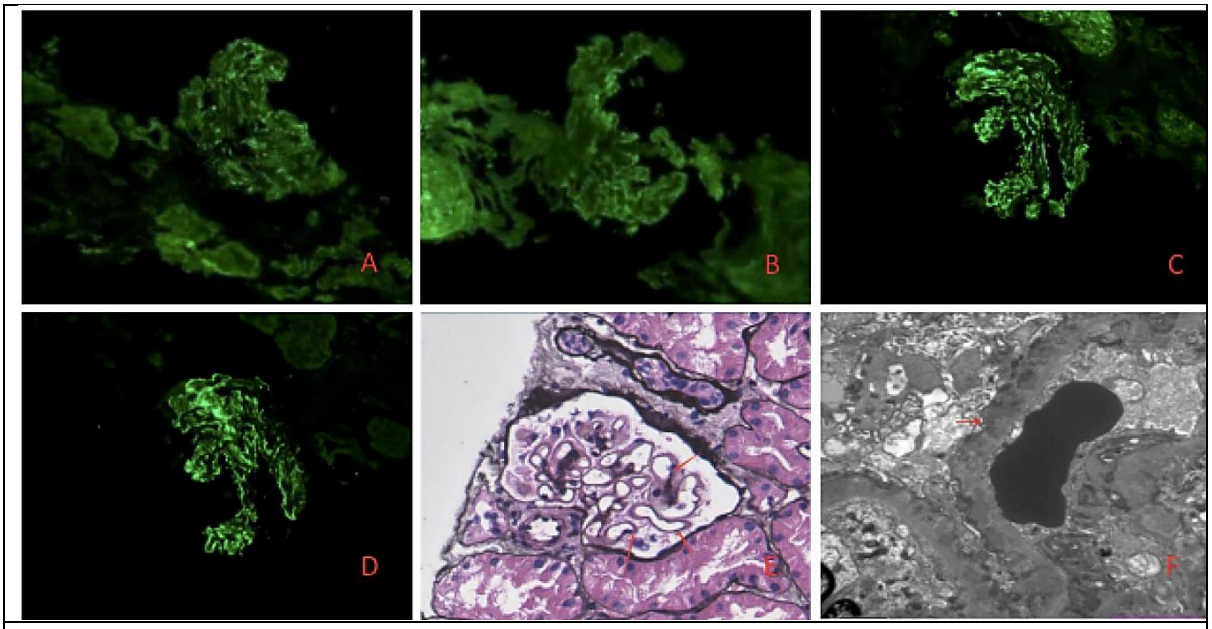
Gitelman syndrome (GS) is an autosomal recessive, salt-losing tubulopathy marked by hyperreninemic hyperaldosteronism, hypokalemia, metabolic alkalosis, hypocalciuria, and hypomagnesemia. Familial hypokalemia-hypomagnesemia is another name for the Gitelman syndrome. Mutations in a few of the genes encoding the sodium, chloride, and magnesium carriers in the apical membrane of the distal convoluted tubule result in the autosomal recessive tubular condition known as Gitelman syndrome. A mutation in one of the genes encoding the sodium, chloride, or magnesium carriers in the apical membrane of the distal convoluted tubule results in Gitelman syndrome, an autosomal recessive tubular condition.[1] The SLC12A3 gene, which codes for the sodium-chloride cotransporter of distal convoluted tubules, has mutations that make it inactive causes gitelman syndrome. A common cause of adult nephrotic syndrome (NS), PLA2R-associated membranous nephropathy (MN) is an auto-immune condition characterised by moderate to nephrotic-range proteinuria.[2] Here, researchers describe a case of GS overlapping nephrotic syndrome (NS) caused by PLA2R-associated membranous nephropathy for the first time (MN)

Renal biopsy should be warranted for Gitelman syndrome patients with moderate to nephrotic-range proteinuria.

Case Presentation:

A 24-year-old male patient with recurring limb weariness that had been becoming worse over the past month had been admitted to the hospital. Four years ago, the patient experienced episodes of limb weakness after sweating excessively during each summer, and hypokalemia was discovered. Fatigue was reduced after taking a potassium chloride supplement while hospitalised. However, he stopped taking potassium chloride after being discharged , and every summer, weariness returned as a result of perspiration. After having a tooth out a month prior, the patient experienced limb weakness once more. In the neighbourhood hospital's serum biochemistry, potassium levels were 2.8 mmol/L and albumin levels were 22 g/L; urinalysis revealed 3+ proteinuria. He was consequently admitted to the hospital. After admission, the blood pressure was 108/77mmHg. Laboratory results that were suggestive of GS included hypokalemia related to renal potassium wasting, pomagnesemia, hypochloridemia, metabolic alkalosis, hyperreninemia, and hypocalciuria. The tiazide test was carried out in accordance with the procedure outlined in the prior investigation. The difference in chloride excretion fraction between before and after using hydrochlorothiazide was 0.468%, showing that the patient had no response to the drug, which allowed for a functional diagnosis of GS. To determine the precise type of SLTs, a Next-Generation sequencing (NGS)-based panel was conducted. The gene sequencing procedure was carried out as previously reported [6]. SLC12A3 was found to have two missense heterozygous mutations, c.536T>A(p.V179D) and c.1456G>A(p.D486N). His mother contains the second mutation (c.1456G>A), which is compatible with compound heterozygosity in this case, whereas his father carries the first

mutation (c.536T>A). The SLC12A3 mutation (p.V179D) was predicted to be polymorphic by Mutation Taster, harmful by SIFT, and benign by PolyPhen-2. The mutation of p.D486N was predicted by PolyPhen-2, Mutation Taster, and SIFT to be probably-destructive, disease-causing, and harmful. Finally, GS was diagnosed. His 24-hour proteinuria revealed nephrotic-range proteinuria and hypoalbuminemia. Anti-dsDNA, anti-tiroid antibodies, ANA, ENA, and chest/abdomen imaging test results were all negative. Together, these findings identified nephrotic syndrome (NS). A kidney biopsy was therefore carried out. With thicker basal membrane, spike-like structures, and subepithelial deposition of erythrophilic proteins, light microscopy revealed 18 glomeruli, including 3 sclerotic ones. IgG (3+), IgG1 (3+), IgG4 (3+), C3 (+), and PLA2R (2+) were granular deposits along capillaries, according to the immunofluorescence results of the renal biopsy; Electron microscopy revealed diffuse foot process effacement, uneven thickening of glomerular basement membrane with the thickest region measuring 1500 nm, and deposition of electron dense substance in subepithelial and basement membrane. The anti-phospholipase A2 receptor (PLA2R) blood antibody test result was likewise favourable. Eventually, a PLA2R-associated MN diagnosis was made. The patient's history, laboratory results, and gene sequencing results all pointed to GS concurrent with MN as the final diagnosis. The level of serum potassium and magnesium increased, NS was partially remitted, and anti-PLA2R titre decreased after 6 months of immunosuppressive therapy with methylprednisolone tablets (12 mg once daily) plus tacrolimus (1 mg twice daily), electric supplement with potassium chloride tablets (3.0 g per day), and magnesium oxide (300 mg magnesium per day).



Renal pathology. A, B, C and D:PLA2R、IgG、IgG1、IgG4 were granulardeposition along capillaries (Immunofuorescence×200, fuorescence microscope is OLYMPUSmicroscope), respectively; E: spike like structure (red arrow), andsubepithelial deposition of erythrophilic proteins (PASM×400, light microscope is OLYMPUSmicroscope); F: Electron microscope showed subepithelialdeposition of electron dense substance (red arrow), difuse foot process efacement(Electron microscope×5000, electron microscope is JEOL)

Discussion:

GS is an uncommon SLT inherited by autosomal recessive gene. Patients with GS may experience polydipsia, polyuria, paroxysmal tetany, and tiredness that are all brought on by hypomagnesemia. It is advised that GS patients consume foods high in sodium chloride and potassium supplements throughout their lives. In GS patients, nephrotic-range glomerular proteinuria is uncommon.[2] There are currently limited instances of GS with mild to nephrotic-range proteinuria. Therefore, renal biopsy should be recommended for GS patients who have mild to moderate nephrotic glomerular proteinuria. In addition to potassium and magnesium supplements for GS, glucocorticoids or other medications may be administered if there are primary glomerular disorders.[3,4] An auto-immune condition known as PLA2R-associated MN is characterised by diffuse thickening of the glomerular basement membrane and subepithelial immune complex deposition not caused by inflammation. Given that 70–80% of patients with primary MN have circulating PLA2R antibodies.[5] GS is frequently diagnosed in children and young adults, including the patient in question, and MN is unusual for a patient of the patient's age, it is still likely mere coincidence that GS and PLA2R-associated MN are attributed.

Conclusion:

This is an instance of GS coexisting with MN. For GS patients with mild to nephrotic-range glomerular proteinuria, a renal biopsy should be necessary to determine the best course of treatment. Tacrolimus may also be more beneficial in the treatment of GS patients with NS attributable to PLA2R associated MN.

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