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.

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Looking forward to your valuable feedback

Best Regards,

Medical Team, Micro Labs Ltd

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1. Study on Growth Differentiation Factor 15 and the Risk of Mortality in Patients on Haemodialysis

Introduction:

Identifying haemodialysis patients who are at high risk for cardiovascular problems and mortality noninvasively might improve their prognosis. Renal replacement treatment patients with kidney failure have a poor prognosis since they have greater risk of cardiovascular problems and death compared to the general population.[1] Growth differentiation factor 15 (GDF-15) is a distant member of the transforming growth factor beta superfamily. A predictive biomarker for several disease types, including cardiovascular disease.[2]This study's objective was to evaluate the relationship between GDF-15 blood levels and mortality in a group of HD patients who were on maintenance HD.

In patients receiving maintenance haemodialysis, this study outlines promising predictive capabilities of circulating GDF-15 to predict long-term survival beyond clinical parameters.

Methods:

Following a routine haemodialysis session and a clinical check for all-cause mortality, circulating GDF-15 levels were evaluated in 30 patients. The measurements were made with the Proseek Multiplex Cardiovascular disease panels from Olink Proteomics AB, and they were verified with the Elecsys GDF-15 electrochemiluminescence immunoassay on a Cobas E801 analyzer from Roche Diagnostics.

Results:

A median of 38 months passed, and 9 patients (30%) passed away. There were two fatalities in the group of patients with lower GDF-15 levels and seven deaths in the patients with circulation GDF-15 levels above the median. AUC of circulating GDF-15 to predict long-term mortality is 0.76, P=0.028, and death was significantly greater in individuals with circulating GDF-15 levels above the median (log-rank, P=0.044). The Charlson comorbidity score and the prevalence of the majority of important comorbidities were comparable between the two groups. The correlation between the two diagnostic techniques showed a strong degree of agreement (Spearman's rho =0.83, P< 0.001).

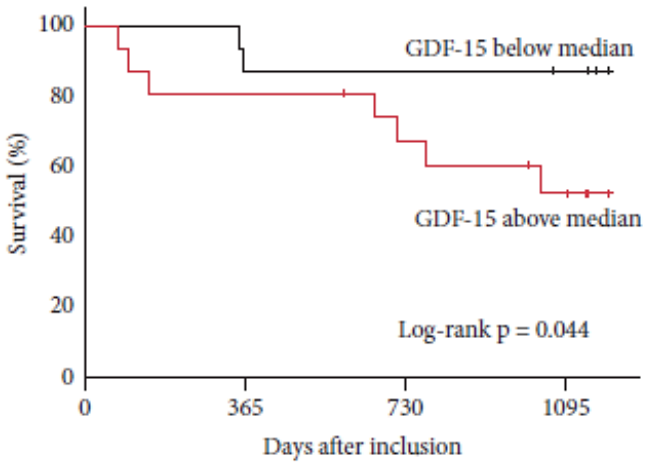
Discussion:

This study, conducted in a cohort of patients on maintenance HD with a follow-up of more than 3 years, was able to confirm the significant correlation between circulating GDF-15 and overall mortality. When compared to individuals with lower GDF-15, patients with high GDF-15 showed a 3-fold greater mortality rate..[1]The results of this study are

consistent with those of earlier investigations as well as a recent large secondary patient-level analysis of eight randomised clinical trials across various forms of atherosclerotic cardiovascular disease, which found a significant correlation between circulating GDF-15 and a number of cardiovascular events, including death and heart failure admissions. [3]

Conclusion:

This study outlines promising predictive features of circulating GDF-15 to anticipate long-term survival beyond clinical indicators in patients receiving maintenance haemodialysis. These observations need to be confirmed by larger multicentric research.



Prognostic properties of GDF-15 for 1-year mortality in haemodialysis patients. (a) Survival of haemodialysis patients according to circulating levels of GDF-15 after HD session.

Reference:

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2. The effect of pre-transplant nephrectomy on individuals with autosomal dominant polycystic kidney disease's quality of life

Introduction:

An hereditary multisystemic condition of the renal tubules called Autosomal dominant polycystic kidney disease(ADPKD) leads to the development of multiple cysts and

enlargement of the kidney, impacting a number of other organs.[1] Although though patients with ADPKD experience variable disease progression rates, the majority of patients eventually require kidney replacement therapy. In certain ADPKD patients, a nephrectomy is necessary as part of the preparation for a kidney transplant.[2] Researchers looked at how pre-transplant nephrectomy affected this group's quality of life because the effects of the procedure was unknown.

Nephrectomy prior to transplantation improves quality of life in Autosomal dominant polycystic kidney disease patients.

Methods:

All ADPKD patients ≥ 18 who underwent kidney transplantation at University Medical Centers were invited to take part in this retrospective cohort analysis. An invitation letter and printed questionnaire were mailed to all qualified patients along with a return envelope. Patient characteristics, nephrectomy, transplantation, quality of life, and patient experience made up the data that was collected. Using three validated questionnaires at three different time intervals, quality of life was evaluated. In order to prepare for transplantation, nephrectomy was done.

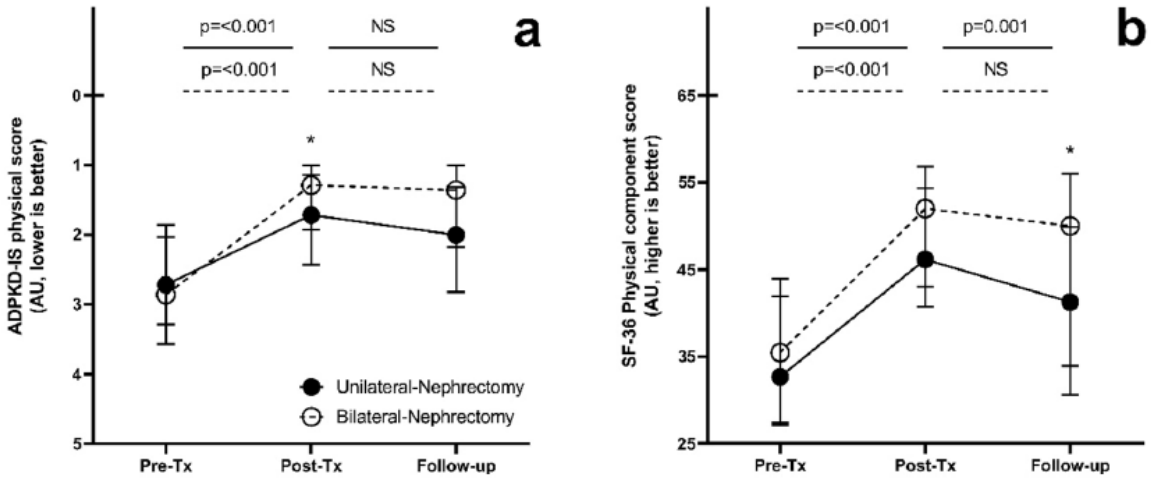
Results:

A total of 276 individuals with ADPKD (53% male, 53 9 years old) were enrolled. In order to prepare for transplantation, native nephrectomy was performed on 98 patients (35.5%), 43 of whom received bilateral nephrectomy. Pre-transplantation ADPKD-IS scores were lower in the group that underwent nephrectomy compared to the group that underwent no nephrectomy (physical: 2.9 vs. 2.3, p <0.001; emotional: 2.0 vs. 1.8, p = 0.03; fatigue: 3.0 vs. 2.3, p = 0.01). Both post-transplantation and post-nephrectomy ADPKD-IS scores dramatically improved, with the nephrectomy group seeing a noticeably greater improvement. All scores were higher than they had been before to transplantation during the follow-up. After transplantation, observed physical QoL was higher following bilateral nephrectomy as compared to unilateral nephrectomy (ADPKD-IS physical 1.3 vs. 1.7, p = 0.04; SF-36 physical 50.0 vs. 41.3, p = 0.03). After bilateral nephrectomy as opposed to unilateral nephrectomy, observed physical QoL was improved (ADPKD-IS physical 1.3 vs. 1.7, p = 0.04; SF-36 physical 50.0 vs. 41.3, p = 0.03). The choice to forgo a nephrectomy was made by the treating physician, however looking back, 19.7% of patients would have preferred to undergo a nephrectomy.

Discussion:

This study shows that individuals with ADPKD who underwent a nephrectomy in order to receive a kidney transplant had a poorer quality of life than patients who did not have a nephrectomy.[2] A kidney transplants improved people's quality of life, according to several studies. According to Erikson et al., who used the SF-12 to evaluate patients with ADPKD for quality of life, physical component scores for CKD 4-5 and dialysis patients, respectively, indicating that physical quality of life decreases as kidney function

worsens.[3] Pre-transplantations physical quality of life was significantly worse for ADPKD patients in this research than for the general population (physical component score: 37).



Quality of life assessment for unilateral (*n* = 54) and bilateral (*n* = 43) nephrectomy separately. A ADPKD-IS physical; B SF-36 Physical component score.
Abbreviations are: IS Impact scale, *SF-36* Short Form 36, *AU* artificial unit, *Pre-Tx* 12 months before transplantation, *Post-Tx* 12 months after transplantation.
Comparison between both groups on several time points: *, *p* = < 0.05, **, *p* = < 0.01 ***, *p* = < 0.001. A higher level on the Y-axis depicts a higher quality of life

Conclusion:

In conclusion, this study demonstrates that ADPKD patients who were chosen to have a pre-transplantation nephrectomy had more complaints before to transplantation than patients who did not have a nephrectomy, which led to a decreased quality of life. These patients' quality of life considerably improved following nephrectomy and transplantation, and at both short- and long-term follow-ups, patients with transplanted ADPKD who underwent nephrectomy or not experienced similar levels of quality of life.

Reference:

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3. An investigation of Pre-therapeutic lymphocytopenia as a novel predictive marker for endovesical BCG immunotherapy failure in non-muscle invasive bladder cancer.

Introduction:

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Bladder cancer is the 11th most prevalent cancer overall and the 7th most frequent in males. The greater part of bladder malignancies has urothelial histology, and localised bladder urothelial carcinoma (UCB) is generally divided into muscle-invasive disease and non-muscle invasive bladder cancer (NMIBC).[1] The beginning and growth of malignancies are significantly influenced by inflammation. Many urological and non-urological malignancies have demonstrated the prognostic significance of inflammatory biomarkers. Since inflammation is the basis of the endovesical BCG immunotherapy's mechanism of action in the treatment of non-muscle-invasive bladder cancer (NMIBC), lymphocytes play a significant role in this response, especially in the cytotoxic phase, and can serve as early biomarkers of the treatment's effectiveness.[2] The primary objective is to look into how the number of lymphocytes affects the response to endovesical BCG immunotherapy, and more particularly how lymphocytopenia (Lp) functions as a prognostic indicator for BCG failure.

This study found a connection between the lymphocyte count and the development of non-muscle invasive bladder cancer

Methods:

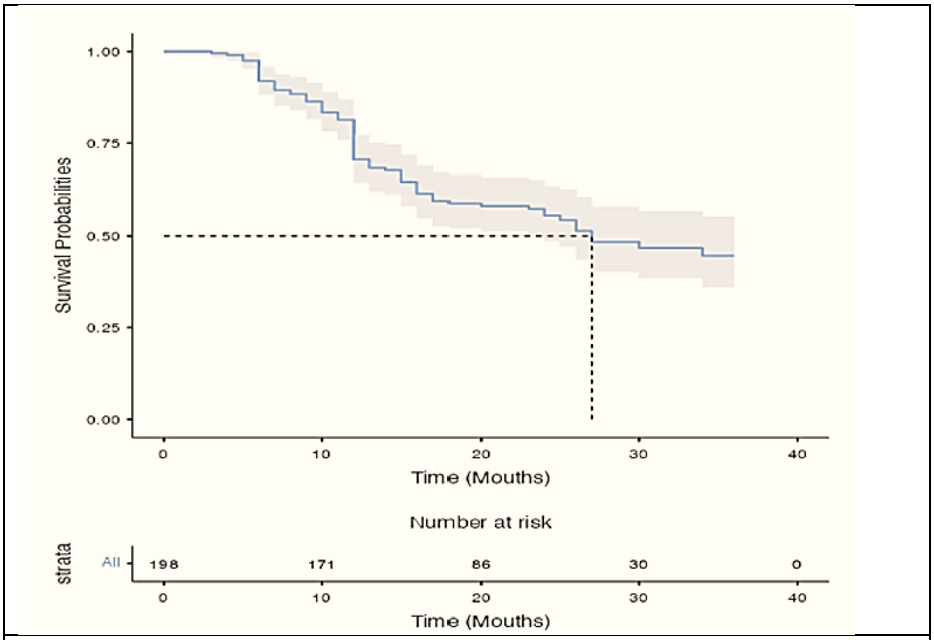
This study is a monocentric retrospective cohort conducted for prognostic purposes, involving 200 patients with non-muscle-invasive bladder cancer (Ta -T1 stages), who needed adjuvant treatment before transurethral resection of the bladder(TURB) with BCG-immunotherapy during a 5-year period. Using the maximum Log-Rank test, the cutoff value was set at 1.67 10^9/ L. Using a Kaplan-Meier model, survival analysis was investigated. Using the Log-Rank test, it was possible to compare the thresholds (L≤ Vs > 1.67 10^9/ L) for the progression and recurrence rates. The Cox model evaluated in univariate and multivariate analysis the relationship between lymphocytopenia and BCG treatment failure. Jamovi Software was used to do the statistical analysis.

Results:

One hundred eight patients had lymphocyte counts greater than 1.67 10^9/L, whereas 92 had lymphocyte counts lower than this. The average lymphocyte count was 1.64. (1.19; 2.4). With a median of 22 months in the > 1.67 10^9/ L group vs 11 months until failure in the ≤ 1.67 10^9/ L group, the high lymphocyte-count group had substantially superior median survival without BCG therapy failure. Both univariate (HR = 4.80, P ≤0.001) and multivariate (HR = 1.88, P = 0.025) investigations found an association between a lymphocyte count below 1.67 109/L with the failure of BCG treatment. T1 stage (P = 0.001), high-grade urothelial carcinoma (P = 0.001), multifocal tumour (P = 0.001), tumour size > 3 cm (P = 0.001), concurrent carcinoma in situ (Cis) (P = 0.001), and vascular emboli (P = 0.001) were other characteristics linked in the univariate investigation. In addition to lymphocytopenia, the occurrence of T1 stage (P = 0.011) and vascular emboli (P = 0.013) were important variables identified by multivariate analysis.

Discussion:

In this study, Lymphocytopenia and the failure of adjuvant BCG-immunotherapy were shown to be significantly correlated. In both univariate and multivariate investigations, low lymphocyte counts were linked to the failure of BCG immunotherapy. Lymphocytopenia was also linked to recurrence. According to these results, lymphocytes and inflammation have a part in both the development of cancer and the immunological responses to BCG.[2] At the initiation and progression of cancer, the inflammatory response is essential. These factors have led to a primary emphasis on and validation of predictive usefulness of inflammatory biomarkers, such as neutrophil/lymphocyte ratio, CRP, mean platelet volume, etc. in a number of urological and non-urological malignancies.[3]



The probability of BCG-therapy failure according to lymphocyte count by Kaplan–Meier model

Conclusion:

In NMIBC, this study detected an association between lymphocytopenia and BCG-immunotherapy failure. In this study, lymphocytopenia significantly affected recurrence as well as increased the risk of BCG-immunotherapy failure in patients.

References:

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4. An case report on unusual form of kidney injury by microscopic polyangiitis.

Introduction:

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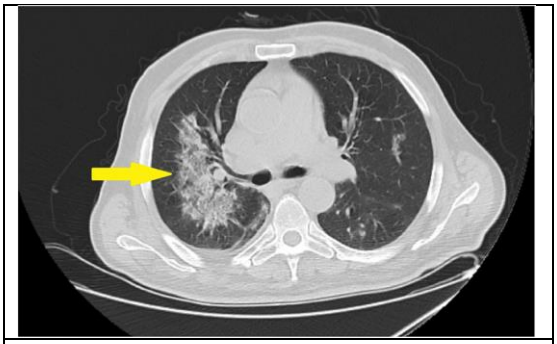
Microscopic polyangiitis is a small vessel necrotizing vasculitis, a part of a extensive range of disorders termed anti-neutrophil-cytoplasmic-antibody (ANCA)-associated vasculitides (AAV). This includes renal limited vasculitis (RLV), eosinophilic granulomatosis with polyangiitis (EGPA), microscopic polyangiitis (MPA), and granulomatosis with polyangiitis (GPA). [1] The pulmonary-renal syndrome has MPA as a prominent contributing factor. The characteristic renal histopathological feature of AAV is pauci immune necrotizing and crescentic glomerulonephritis. Tubulointerstitial lesions are possible and often develop as a result of interstitial inflammatory cell infiltration. Nevertheless, in a few number of cases, MPA patients only had tubulointerstitial involvement without glomerular abnormalities. [2]The pulmonary-renal syndrome with a life-threatening renal component is discussed in this study. Here, researchers describe a case of MPA-induced renal damage that necessitated dialysis.

Physicians should be aware of uncommon vasculitis presentations since researchers demonstrated microscopic polyangiitis's unique kidney involvement."



Thoracic Computerized Tomography Image. Yellow narrow shows interstitial fibrosis area due to vasculitis involvement

Case Presentation:

A man in his 70s was brought into the emergency room after becoming confused and vomitting. His problems began two weeks prior. He had first had a headache and sleeplessness check by a neurologist. There had only been a rise in blood pressure (155/95 mmHg). 0,8 mg/dl of serum creatinine has been measured. Just a salt-free diet had been suggested to him as a treatment for newly developed hypertension. Yet over time at home, the patient's condition had got worsened. He was then taken by ambulance to the hospital owing to his impaired consciousness. He was disoriented, tachypneic (24 beats per minute), tachycardic (106 beats per minute), and hypertensive (170/95 mmHg) when examined physically. The mouth was dry, the lower right side of the respiratory sound diminished, and palpable purpura with pitting edoema was being detected on the lower legs. These were the outcomes of the second laboratory test: BUN:154 mg/dl, creatinine: 19,2 mg/dl, sodium: 138 mEq/L, potassium: 6,2 mEq/L, calcium: 9,5 mg/dl, phosphorus: 9,9 mg/dl, uric acid: 12 mg/dl, glucose: 82 mg/dl, protein:5.6 g/dl, albumin: 2,8 g/dl, ALT: 25 IU/L, AST:13 IU/L, LDH: 201 IU/L, bilirubin: 0,4 mg/dl, CRP: 164 mg/L, leukocyte: 14.2 103/ µl, hemoglobin: 8.2 g/dl, platelet: 390 103/ µl. The urine output was less than 100 ml. Less than 100 ml of urine were produced. Due to hyperkalemia and uremic symptoms, emergency dialysis (two hours) was carried out immediately. Isomorphic erythrocytes, pyuria, granular cast, and leukocyte cast were all found in the urine sediment study. The ratio of urine protein to creatinine was 0.8 mg/g. Following the second dialysis treatment,

his clinical state got better. The confusion was cleared, and the blood pressure was under control. He also resumed oral feeding. Nevertheless, there was no increase in urine production, and oliguria persisted. After then, on the third day of hospitalisation, hemoptysis began. Thoracic computed tomography was used immediately to do the chest imaging (CT). Bilateral interstitial fibrotic regions and a minor pleural effusion were seen on the CT scans; these results were described in accordance with pulmonary involvement of the vasculitis event. Anti-glomerular basal membrane (GBM) antibody was negative, anti-nuclear antibodies (ANA) was positive with 1/100 titer (granular pattern), anti-double-stranded DNA antibody was negative, anti-SSA/anti-SSB were negative, C3/C4 levels were within the normal range, cytoplasmic ANCA (C-ANCA) was negative, and P-ANCA was positive, according to the immunoassay laboratory's findings (formaline resistance). The elevated titers of MPO-ANCA (> 200 RU/ml) in the perinuclear staining were verified by the ELISA assay. Finally, monoclonal gammopathy was not detected by serum protein electrophoresis, and the serum-free light chain ratio (K/) was within the normal range. After numerous dialysis treatments, a kidney biopsy was carried out. Acute tubulointerstitial nephritis was diagnosed after a kidney biopsy. As a result, doctors have chosen to diagnose the MPA. Due to the potentially fatal vasculitis, doctors preferred a therapy that was comparable to that for crescentic glomerulonephritis. Pulse steroid treatment was started with an oral dosage of 1 mg/kg/day and maintained for 3 days with 500 mg of methylprednisolone. The treatment consisted of 15 mg/kg of parenteral cyclophosphamide every three weeks. The cyclophosphamide treatment was scheduled to last for 6 months. Fresh Frozen Plasma was used in seven plasmapheresis sessions (FFP). As the patient weighed 72 kg, each session required around four litres of FFP. Every other day, plasmapheresis procedures were carried out. With induction treatment, clinical and radiological improvement was shown in the lung and skin lesions, though the need for dialysis persisted.After being sent home, dialysis therapy was continued three times each week. Three different cycles of cyclophosphamide were given. While the amount of urine produced increased to around 1 litre per day, the estimated glomerular filtration rate (eGFR) remained under 10 ml/min/1.73 m2. The patient afterwards had SARS-CoV-2 infection.Due to his serious illness, he was hospitalised in the critical care unit. He eventually passed away from severe respiratory failure.

Discussion:

A case of pulmonary-renal syndrome caused by MPA is reported here. In the described case, only tubulointerstitial nephritis (TIN) affected the kidneys. For AAV, this situation is uncommon and surprising. TIN is usually brought on by medications or systemic conditions such sarcoidosis, systemic lupus erythematosus, and Sjögren's syndrome. In this case, the potential differential diagnosis of interstitial nephritis in AAV was evaluated. Because there were no autoantibodies, autoimmune illnesses were ruled out. After microbiological analysis, the infectious causes were ruled out. No signs of uveitis were seen. Due to the absence of tissue granulomas and hypercalcemia, researchers did not consider sarcoidosis. One day before to the emergency hospitalisation, this patient just took one paracetamol tablet. The predicted start of a drug-induced TIN and the need

for dialysis cannot be met in this time frame (1 day).[2] In the literature, TIN related with paracetamol was reported.[3] However only one day after starting the medicine, significant AKI was found. Moreover, symptoms had already started to manifest before using paracetamol. In light of this, we excluded TIN linked to drugs. A combination of distinctive clinical signs, pathological evidence, laboratory testing, and imaging techniques are used to make the diagnosis of AAV. Acute renal damage, radiographic lung abnormalities, skin lesions, and a positive MPO-ANCA test all contributed to the diagnosis of MPA in the case at hand.[2]

Conclusion:

Despite an increase in instances being documented, the pathogenesis of this unusual MPA process is still unknown. This variety may be viewed as little more than a basic histological elaboration. It has a vital role in directing the course of treatment, nevertheless. Moreover, this example highlights the role played by vasculitides in the development of TIN. Physicians should be aware of uncommon vasculitis presentations since researchers demonstrated MPA's unique kidney involvement..

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