

**5<sup>th</sup>** CONGRESS OF

# Mediterranean Kidney Society (MKS)

TOGETHER WITH THE SYMPOSIUM OF THE  
**Croatian Nephrology  
Nurses Association**

September 29  
- October 02 **'22**  
DUBROVNIK  
CROATIA

# ABSTRACT BOOK

[WWW.MKS2022.CONVENTUSCREDO.HR](http://WWW.MKS2022.CONVENTUSCREDO.HR)

# IZJEDA LI ANEMIJA VAŠE BOLESNIKE S KBB-OM?



Anemija pogađa približno 20% bolesnika s KBB-om, a njezina prevalencija raste s pogoršanjem bubrežne bolesti.<sup>1</sup>

KBB, kronična bubrežna bolest; KV, kardiovaskularni

**Reference:**

1. Dmitrieva O *et al.* *BMC Nephrol* 2013; 14:24.

NEPH\_2021\_0045\_AB | Rujan 2021

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Naziv tvrtke Astellas i logotip s prikazom zvijezde padalice registrirani su žigovi tvrtke Astellas Pharma Inc.

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**Legend:**

INV – Invited lecture

SP – Sponsored lecture

O – Oral presentation

P – E-poster

RN – Renal Nurses

Mediterranean Kidney Society 2022 Congress web site:  
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Croatian Nephrology Nurses Association web site:  
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## **Congress venue**

Valamar Lacroma Dubrovnik Hotel  
Iva Dulčića 34  
20000 Dubrovnik, Croatia

## INV1

### Invited lecture

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# RENAL REPLACEMENT THERAPY IN CROATIA: PAST, PRESENT AND FUTURE

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The Republic of Croatia is a relatively small country with a long tradition in nephrology. In the last 30 years, despite the independence war, significant progress has been made in all branches of nephrology. This progress could be achieved thanks to the great knowledge, enthusiasm and excellent organizational abilities of individuals, a stable Society for Nephrology, Dialysis and Transplantation, the establishment of the National Registry for Replacement of Renal Function and well-organized continuous medical education. This has led to important improvement in the treatment of patients with end-stage renal disease (ESRD) by hemodialysis (HD) and peritoneal dialysis (PD).

From the early years of HD treatment up to date, great progress has been made in Croatia, which is based primarily on HD equipment technological advancement. Modern dialysis devices with volumetric ultrafiltration, profiling of dialysis solutions, ultrapure dialysis fluid preparation with special filters, modern online hemodiafiltration system, blood temperature monitoring, dialysis dose calculation, and a number of safety sensors are used. The standards for water quality for HD are in accordance with the EU guidelines.

Critically ill AKI patients are treated in intensive care units under the supervision of an intensivist and a nephrologist. In most hospital settings, methods such as HD, PD, continuous renal replacement therapy (CRRT), and sporadically hybrid dialysis are used. In case of indication, it is possible to combine CRRT and extracorporeal membrane oxygenation treatment, and lately use artificial liver support systems. All of the above methods are used in the treatment of adults and children with AKI.

The number of patients treated with continuous ambulatory peritoneal dialysis (CAPD) and later with automated peritoneal dialysis (APD) has increased gradually, in parallel with technical advancement. New developments in preventing the causes of technique failure, have encouraged us to apply PD more frequently in treating patients with AKI (especially children) and ESRD. However, in Croatia, PD has always been the second method of choice for renal replacement therapy.

Today, both in Croatia and the world, ever more patients are suffering from acute or chronic kidney disease. It is therefore important to detect patients at an early stage of the disease, treat them appropriately and if possible, avoid the occurrence of AKI or ESRD.

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## **PAIN MANAGEMENT OF PATIENTS WITH CHRONIC KIDNEY DISEASE AND END STAGE RENAL DISEASE**

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### **AIM**

Pain is a complex uncomfortable sensation caused by a multitude of etiological factors. It is divided into many different types, differing by the mechanism of origin and the presence of other subjective sensations related to pain. The phenomenon of pain is a subjective one, with various painful stimuli being described and felt differently among individual patients. Patients with chronic kidney disease (CKD), especially those with end stage renal disease (ESRD), are often undertreated for pain, resulting in lowered adherence to therapy and a higher incidence of anxiety and depression, ultimately leading to an overall lower quality of life. There are many factors included in the undertreatment of pain in this patient population, with the main ones being inadequate pain assessment and fear of prescribing pain medication due to renal function impairment.

### **MATERIALS AND METHODS**

A search of the available literature was performed through PubMed, using the following keywords: “pain management”, “chronic kidney disease”, “end stage renal disease”. The results were filtered and studied, with the final version of the review using 39 papers as references, with additional information about specific medications acquired from the manufacturers’ websites and drug information sheets.

### **RESULT AND CONCLUSION**

This review aims to educate all physicians working with CKD patients and provide an overview of the most commonly used pharmacologic pain management strategies and their feasibility in treating this sensitive patient population, therefore hopefully making the current statistics of undertreated pain in CKD less grim than they currently are. It is by no means a complete resource for every analgesic drug and their interactions with the kidneys, but is a comprehensive review of the most commonly used analgesic modalities aimed at providing physicians with a quick, easy to consult guide on the logistics of managing and treating pain in a population that needs it the most.

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## HYPERURICEMIA AND HIGH URINARY URIC ACID LEVELS ARE THE NEW INDEPENDENT RISK FACTORS FOR CONTRAST INDUCED NEPHROPATHY

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### AIM

Recent studies have reported that hyperuricemia seem to be a useful biomarker in the early prediction of CIN incidence. The role of urine PH and spot uric acid to creatinine ratio (UACR) provide controversial evidence on the occurrence of CIN. This research aims to gather evidence on the effect of uricemia, urine PH and UACR on the development of CIN in acute conditions like primary percutaneous coronary interventions (PCI).

### MATERIALS AND METHODS

A sample of 100 patients who underwent emergency PCI in Cardiology ICU/UHCN-Tirana/Albania from October 2021- March 2022 were monitored. CIN incidence was monitored, while CIN was defined as an increased creatinine levels of more 25% of the baseline in a time window of 48-72h after the contrast. The analyses of the results were performed using ANOVA to test for differences in parameters among CIN/ Non – CIN patients. In order to understand the effect of each factor on the probability of experiencing CIN a binary logistic regression model was constructed. Statistical analyses were performed using R-software.

### RESULT AND CONCLUSION

The incidence of CIN is 40%, 60% were men and the mean age is 64.7 years old. The ANOVA analyses showed that incidence of patients experiencing CIN is significantly different for CKD ( $p < 0.001$ , OR=32.67 (95%CL 9.65-110.55), diabetes ( $P < 0.0033$ , OR=4.64 (95%CI 1.69-12.68) and hypertension ( $p < 0.055$ , OR=7.80 (95%CI 0.96-63.56). The binary logistic regression showed that probability to experience CIN is significantly impacted by UACR post contrast model 1 :3.123 (2,385) with marginal effect 22.72, BMI index model 1: (-0.850) 0.25 with marginal effect 1.28, Uricemia model 1: (1,128) 0.52 with marginal effect 1.68. Statistical significance for these results is 99% (as manifested by p-value).The results confirm that hyperuricemia and high UACR post contrast are the new independent risk factors for CIN.

**INV4**  
Invited lecture

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## **KIDNEY IN INFLAMMATORY BOWEL DISEASE - INNOCENT BYSTANDER OR EXTRAINTESTINAL MANIFESTATION?**

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### **AIM**

The incidence of inflammatory bowel disease (IBD) in the modern world is increasing. Literature data supports a significantly higher incidence of IBD in the population of patients with kidney disease. Also, there is evidence for an increased incidence of kidney disease, including renal failure, among IBD patients.

### **MATERIALS AND METHODS**

There is accumulating evidence that kidney disease is not only a complication of IBD or its treatment, nor systemic inflammation, but one of the genuine extraintestinal manifestations. IBD can rightly be called a systemic disease, and the renal lesion that occurs as part of IBD deserves more attention and additional research in order to understand, prevent and timely recognize and treat it.

### **RESULT AND CONCLUSION**

This invited lecture will be a review of the published knowledge so far, as well as the plan of our research on this topic.

## SP1

### Astellas sponsored lecture

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# CLINICAL CHARACTERISTICS AND OUTCOMES OF KIDNEY TRANSPLANT RECIPIENTS WITH SARS-CoV-2 REINFECTIONS

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## AIM

Data on SARS-CoV-2 reinfections in kidney transplant recipients (KTR are lacking).

## MATERIALS AND METHODS

A retrospective observational study recruited participants between March 2020 and May 2022 to determine the rate of SARS-CoV-2 reinfections and their outcome in KTR. Reinfection was defined as positive SARS-CoV-2 RT-PCR after initial infection and proven eradication. The primary outcomes were the need for hospitalization during the reinfection and mortality.

## RESULT AND CONCLUSION

Sixty-two patients developed SARS-CoV-2 reinfection at the median of 11 months after the first infection (2.2% of the total cohort and 7% of patients who experienced acute COVID-19). The median age was 51 years, and 42% were female. Sixty-six percent of patients received at least one dose of the anti-SARS-CoV-2 vaccine before the reinfection. Febrility was a more common presenting symptom during the first (68%) than the second infection (48%). 42% were asymptomatic. Twenty-two patients (35.5%) required hospitalization during the reinfection for a median of 10 days. Three patients (4.8%) died, all from respiratory insufficiency. Two were fully vaccinated, and one received one dose of vaccine. Proteinuria ( $p=0,03$ , OR 4,99) and rehospitalization after primary acute COVID-19 ( $p=0,004$ , OR 11,09) had a unique statistically significant contribution to the model which predicted hospitalization during the SARS-CoV-2 reinfection. Hospitalization after reinfection was necessary in 11 patients (17.7%). Three patients died after recovery from the reinfection. Two of them were not vaccinated. In conclusion, COVID-19 reinfection can occur in KTR and may be severe. Further work is urgently needed to better understand reinfections with COVID-19 in this endangered group of patients.

## IRON PARAMETERS IN PATIENTS TREATED WITH ROXADUSTAT FOR ANEMIA OF CKD: POST HOC ANALYSIS OF NDD OR INCIDENT DIALYSIS PATIENTS FROM FOUR PHASE 3 STUDIES

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### AIM

Anemia is a common complication in patients with chronic kidney disease (CKD) who are non-dialysis-dependent (NDD) or incident dialysis-dependent (ID-DD) (ie, initiated dialysis within the last 4 months). This post hoc analysis was performed to examine iron metabolism parameters in patients with anemia of CKD who were NDD/ID-DD and treated with either roxadustat or an erythropoiesis-stimulating agent (ESA).

### MATERIALS AND METHODS

The results of four phase 3, randomized, open-label studies (NDD [DOLOMITES]; ID-DD [HIMALAYAS, SIERRAS, ROCKIES]) comparing oral roxadustat to an ESA (darbepoetin alfa or epoetin alfa) for patients with anemia of CKD were pooled in this post hoc exploratory analysis. Iron metabolism parameters (serum iron, ferritin, total iron binding capacity [TIBC], transferrin saturation [TSAT]), hemoglobin, and proportion of patients using intravenous (IV) iron supplementation were measured at various intervals within the 52-week efficacy evaluation period in patients with NDD or ID-DD CKD.

### RESULT AND CONCLUSION

In total, 2129 patients were evaluated (1078 roxadustat, 1051 ESA). Hemoglobin levels increased from baseline to Weeks 28-52 for patients receiving roxadustat with NDD/ID-DD CKD compared to ESA active control ( $P=0.0153$ ). Treatment with roxadustat was associated with increased serum iron ( $P=0.0003$ ) and TIBC ( $P<0.0001$ ) from baseline to Week 20 compared to treatment with ESA. Ferritin and TSAT did not significantly change from baseline to Week 20 in patients with NDD/ID-DD CKD receiving roxadustat ( $P=0.4637$  and  $P=0.7774$ , respectively). Fewer patients receiving roxadustat received IV iron supplementation at Week 52 ( $P<0.0001$ ). Compared with ESA, roxadustat treatment was associated with improvement in iron metabolism while achieving a statistically significant increase in hemoglobin levels in patients with anemia of NDD or ID-DD CKD.

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## ASSOCIATION OF VASCULAR APPROACH FOR HEMODIALYSIS AND INFECTION IN DIALYSIS PATIENTS

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### AIM

Frequent infections in patients treated with dialysis are one of the most common causes of mortality and morbidity in that population. In these patients, infections are most often associated with dialysis access.

### MATERIALS AND METHODS

We made a cross section for three months at the Clinic for nephrology, Clinical Center of Montenegro (January 2021 - April 2021). Obtained results were processed with descriptive statistics.

### RESULT AND CONCLUSION

Study showed that 6 patients had some form of infection and they were on a chronic hemodialysis program in the observed period, independently of the vascular approach. In that period, 84 to 92 patients were treated monthly with hemodialysis. Of 6 patients, 4 (66.7%) had CVC. All patients had comorbidities. Five patients had positive hemocultures. *Staphylococcus aureus* was isolated in four patients and *Enterococcus* was isolated in one patient. Febrile state was clinically dominant in 5 (83.3%) patients without any other manifestations. Sepsis was diagnosed in two patients. One respiratory and infection of soft tissue each were also verified. All patients were cured. Conclusion of infected patients, 66.7% had CVC which has the highest risk for the development of infection from all vascular approaches.

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## DIET PATTERNS, NUTRITION STATUS AND PHYSICAL PERFORMANCE IN PATIENTS ON PERITONEAL DIALYSIS

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### AIM

Suboptimal nutritional status and physical inactivity are standard in peritoneal dialysis patients and are consequences of the restrictive diet, appetite loss, and poor physical fitness. The aim of this study is to evaluate the dietary habits and nutritional status of our PD-positive selected patients and to investigate their relationship between energy intake with body mass composition and physical performance. It was proposed that low energy and protein intake of PD patients is strongly connected with low physical performance.

### MATERIALS AND METHODS

This study was an observational, cross-sectional study that included patients treated with maintenance PD for at least 3 months in the hospital PD unit at University Medical Center Ljubljana. Patients with inadequate dialysis, active congestive heart failure, advanced liver disease, active malignancy, recent peritonitis or hospitalization within 3 months, and active inflammation were excluded. Dietary assessment was performed with a three-day 24-hour dietary recall, while nutritional status was assessed with body composition measurements and classical biochemical data. Patients' physical performance was evaluated with a handgrip test and a sit-stand test.

### RESULT AND CONCLUSION

The mean caloric intake of the 19 patients was lower than optimal values at  $1545 \pm 295$  kcal/day ( $21.4$  kcal/kg BW/day), and the mean protein intake was  $0.8$  g/kg BW/day, which is suboptimal also. The mean value of body mass index was  $24.4 \pm 2.9$  kg/m<sup>2</sup>, phase angle was  $5.2 \pm 0.9$ , lean tissue index was  $14.5 \pm 2.8$  kg/m<sup>2</sup> and adipose tissue index was  $9.3 \pm 3.6$  kg/m<sup>2</sup>. The results of the handgrip test and the sit-to-stand test showed muscular weakness associated with low caloric intake. In our PD patients, average energy and protein intakes are inadequate according to dietary recommendations, which is related to reduced muscle strength among observed patients and poor physical performance. The overall approach of nutritional counselling is necessary to improve the nutritional status of patients.

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## UROLOGICAL COMPLICATIONS AFTER KIDNEY TRANSPLANTATION

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### AIM

Kidney transplantation is the most effective method in the treatment of the end-stage renal disease. Urological complications after kidney transplantation could lead to significant morbidity, graft dysfunction and sometimes even to graft loss and patient death. In our study we evaluate incidence of urological complications after kidney transplantation in our transplant center.

### MATERIALS AND METHODS

We retrospectively analyzed all patients with kidney transplantation operated in University Hospital Rijeka from January 30st 1971 to December 31st 2021.

### RESULT AND CONCLUSION

In observed period 1209 kidney transplantations were performed in our transplant center. Urological complications were noticed in the 158 patients (13.1%). The most frequent complications were ureteral stenosis in 52 patients (4.3%), urinary fistula in 50 patients (4.1%), urinary retention in 25 patients (2.1%) and urolithiasis in the 9 patients (0.7%). The majority of the patients underwent surgical treatment. Recently, minimally invasive surgery was the method of choice for treatment of urological complications. In two patients (0,17%) urological complications caused graft loss and in the three patients (0,25%) this complications lead to the death. Urological complications are not frequent in our transplant population. In the group of patients that required surgical treatment endourology methods are currently the initial treatment modality.

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## WORSENING OF KIDNEY FUNCTION FOLLOWING COVID-19

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### AIM

The goal of this paper is quantifying and describing the population of patients affected with a decline in renal function following COVID-19 in a tertiary care center in Croatia.

### MATERIALS AND METHODS

This is a retrospective analysis of patients affected with a recent decline in renal function following COVID-19. Data was imported from the Hospital Informatical System (BIS) and charted in a database, with the following parameters: Patient gender, age, BMI, blood pressure, laboratory values, estimation of glomerular filtration rate using the 2021 CKD-EPI formula, time elapsed from positive PCR test for SARS-CoV-2. Patients without a digital record of a positive PCR test were excluded, as well as patients without the necessary laboratory and clinical parameters.

### RESULT AND CONCLUSION

Among the 190 studied patients with post-COVID symptoms, 12 (6.31%) had a decline in renal function. When compared to patients with other post-COVID manifestations, these patients had statistically significant lower diastolic blood pressure (median 79 vs 84 mmHg,  $p = 0.033$ ), higher serum creatinine values (median 113 vs 74.5  $\mu\text{mol/L}$ ,  $p < 0.001$ ), lower eGFR (median 46.1 vs 85  $\text{mL/min/m}^2$ ,  $p < 0.001$ ) and higher CRP values (median 36 vs 6.1  $\text{mg/L}$ ,  $p = 0.033$ ). There was no statistically significant difference in age, systolic blood pressure or time to onset of post-COVID symptoms between the two groups. While the mechanisms through which the SARS-CoV-2 virus causes lasting organ damage are still actively being studied, clinicians are faced with the challenge of recognizing patients affected by the so-called “post-COVID” syndrome. Although much of the focus is still being concentrated on treating the active illness, the numbers displayed in this study (more than 6% of patients with post-COVID being affected with lasting renal damage) direct us towards an approach that appreciates COVID-19 as not only an acute condition, but also a potential instigator of “de-novo” chronic illness.

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## POSSIBLE BLOOD VESSEL MARKERS IN HEMODIALYSIS PATIENTS

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### AIM

Blood vessel changes are common in hemodialysis (HD) patients probably as a result of preexisting chronic diseases and conditions such as diabetes, glomerulopathies, hypertension, atherosclerosis, due to chronic dialysis exposure and shear stress induced by arterio-venous fistula creation. To estimate the certain impairment of the blood vessel tissue in these patients, the most appropriate markers have to be chosen. The aim of this study was to examine the biochemical and pathohistological parameters concerning blood vessels damage in HD patients.

### MATERIALS AND METHODS

A number of 48 HD patients (35 male and 13 female) at the age of  $56 \pm 11$  years were examined and compared to the gender and age matched control group ( $n=31$ ). The following laboratory parameters were determined: triglycerides, LDL-ox antibodies, lipid peroxidation (MDA), and biological activity of von Willebrand factor. Following methods were used: for triglycerides (Merck, Germany), enzyme immunoassay for LDL-ox antibodies (Biomedica gruppe, Austria), for MDA fluorimetric method with thiobarbituric acid; for von Willebrand factor (vWf) combination assay by Dade Behring, Germany. For the histopathological findings, the blood vessel samples were taken from the a. radials before arterio-venous fistula creation.

### RESULT AND CONCLUSION

Increased levels of following parameters were found: for triglycerides,  $2.90 \pm 1.1$  mmol/L ( $p < 0.05$ ), for LDL-ox antibodies,  $356 \pm 259$  mU/mL ( $p < 0.01$ ), for lipid peroxidation  $5.36 \pm 0.98$   $\mu$ mol/L ( $p < 0.01$ ) and for biological activity of vWf,  $128 \pm 32\%$  ( $p < 0.05$ ). Histopathological findings showed blood vessel changes regarding intima and media with foam cells proliferation in smooth muscle cells. From the obtained results, oxidative stress may be considered due to the increased level of MDA and LDL-ox antibodies. Furthermore, the increased vWf biological activity and blood vessel changes may confirm the certain endothelial dysfunction in HD patients. All examined markers may be a useful tool to estimate the level of blood vessel changes and may also contribute to evaluate the disease progression state in HD patients.

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## URINARY FETUIN A WITH SPECIFIC POST-TRANSLATIONAL MODIFICATION (uPTM<sub>3</sub>-DKD) IN EARLY DIABETIC KIDNEY DISEASE. ANALYTICAL VERIFICATION AND ASSOCIATIONS WITH METABOLIC INDICES

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### AIM

Albuminuria has been a cornerstone of diabetic kidney disease (DKD) detection for decades. However, a significant proportion of patients progress to kidney function loss without developing albuminuria. Recent evidence suggests that post-translationally modified peptides derived from Fetuin A- a hepatokine with multiple metabolic effects, may be of particular interest in detecting early changes in DKD. This study aimed to perform the analytical verification of the novel IVD/CE certified uPTM<sub>3</sub>-DKD ELISA kit (Bio Preventive Med Corp., Taiwan) and assess the metabolic determinants of its levels in the spot-urine samples of diabetic patients and various degrees of albuminuria.

### MATERIALS AND METHODS

The total imprecision was verified by analysing two pooled urine specimens in triplicate over five days, according to the EP15-A2 protocol. U-PTM<sub>3</sub> was analyzed with a uPTM<sub>3</sub>-DKD ELISA kit in spot urine samples remaining after routine laboratory check-ups of type 2 diabetic patients (N=67, M/F=39/28). The results were normalized to the urinary creatinine measured in the same samples.

### RESULT AND CONCLUSION

The total imprecision of the assay expressed as coefficient of variation (CV) was 12,3% and 7,6%, for the uPTM<sub>3</sub> levels of 4,5 and 12,3 ng/ml, respectively. Median u-PTM<sub>3</sub> was 6,6 (range: 4,5-115,2) ng/ml, and the ratio of u-PTM<sub>3</sub>/creatinine was 0,80 (range:0,16-18,02 ug/mmol). Multivariate regression analysis revealed albumin/creatinine ratio as the significant determinant (t=2,524, P=0,019, r-semipartial=0,4657), while eGFR, age and sex had no influence on u-PTM<sub>3</sub>/creatinine. Patients with A1 albuminuria (N=44) had significantly lower (P=0,034) u-PTM<sub>3</sub>/creatinine than those with A2/A3 albuminuria (N=24). No association was found between u-PTM<sub>3</sub> and metabolic indices: HbA<sub>1c</sub>, lipid profile and serum urate levels. Our preliminary study revealed a significant association between u-PTM<sub>3</sub> and albuminuria in diabetic patients. U-PTM<sub>3</sub>-DKD ELISA kit performed with acceptable imprecision and may provide a reliable tool for further longitudinal studies needed to evaluate the full potential of u-PTM<sub>3</sub> in the early detection of DKD.

## CARDIOVASCULAR PREDICTORS OF MORTALITY IN CHRONIC HEMODIALYSIS PATIENTS

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### AIM

As the incidence of chronic kidney disease (CKD) is on the rise, so are the survival rates and life-expectancy of end-stage renal disease (ESRD) patients, with the population of chronic hemodialysis patients steadily growing. Cardiovascular conditions continue to remain the leading cause of hospitalizations and mortality. The aim of our study was to identify potential cardiovascular predictors of mortality in this population.

### MATERIALS AND METHODS

In this single-center, prospective, cohort study we assessed the impact of cardiovascular risk factors on mortality rates in chronic hemodialysis patients. Cox regression and binary logistic regression analysis were carried out to identify potential predictors of mortality in this population.

### RESULT

308 consecutive patients receiving long-term hemodialysis, between 2012 to 2019, were enrolled in our study. 37.7% were female, the mean age was 52±15.6 years. Mortality in our cohort was estimated to be around 17.9%. Comorbidities, namely diabetes mellitus (p=0.001), peripheral artery disease (p=0.001) and stroke (p=0.015) were found to be important predictors of mortality. Our data showed that among the cardiovascular conditions, left ventricular hypertrophy (LVH) (p<0.01), grade III diastolic dysfunction (DD), 5.2 CI [3.86; 6.64], (p<0.01), elevated pulmonary artery pressure (ePAP), OR (95%CI) 1.624 (1.116-2.363), (p<0.001) and intradialytic hypotension (IDH) (p<0.01) were strong and independent predictors of all-cause mortality. Notably, no significant correlation was found between high blood pressure and mortality rates.

### CONCLUSION

Cardiovascular conditions are prevalent among patients on long-term, maintenance hemodialysis. Our study revealed that left ventricular hypertrophy (LVH), grade III diastolic dysfunction (DD), elevated pulmonary artery pressure (ePAP) and intradialytic hypotension (IDH) were the most robust cardiovascular predictors of mortality, in our cohort. Our findings are consistent with current literature, placing cardiovascular events at the top, as leading causes of death among chronic hemodialysis patients. Adopting a proactive approach in the management of these conditions, can help improve outcomes in this population

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## THE CAUSES OF ACUTE KIDNEY INJURY IN CRITICALLY ILL CHILDREN WHO NEEDS RENAL REPLACEMENT THERAPY

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### AIM

The study was conducted to determine the etiology, outcome of treatment and clinical presentation of AKI in pediatric patients who needed renal replacement therapy (RRT) admitted to the Pediatric Clinic, University Clinical Center Sarajevo (UCCS).

### MATERIALS AND METHODS

Our research included 81 children with AKI who needed RRT. We used the Kidney Disease: Improving Global Outcomes (KDIGO) criteria to define AKI. Severe acute kidney injury was defined as stage 2 or 3 of AKI when plasma creatinine level  $\geq 2$  times the baseline level or urine output  $< 0.5$  ml per kilogram of body weight per hour for  $\geq 12$  hours. Other laboratory findings and imaging tests were made depending on their primary disease that led to the AKI and its complications.

### RESULT AND CONCLUSIONS

We analyzed 81 children, 38 girls and 43 boys, ages from birth to 18 years of age with an AKI who needed RRT. Mean age of presentation was 6.28 years. Male female ratio in this study was 1.1:1. Acute renal dysfunction was evaluated according to the rough classification on prerenal in 57 (70.4%) children, intrarenal in 23 (28.4%), and post-renal causes in 1 (1.2%) patient. Death occurred in 39 (48.1%) of all 81 patients, and in infants in 22 (56.4%), while in children older than one year it was 17 (43.6%). As the AKI plays a key role in the mortality and morbidity in pediatric patients, especially in infants, it is important to recognize and describe different etiologies of this serious condition in our country which makes an important contribution to evaluating the national relevance and burden of AKI. Some causes of AKI are preventable and it should be possible to reduce mortality and morbidity due to AKI through purposive preventive measure and availability of the better medical facility.

## **BENEFITS OF 11-LOCI REAL-TIME POLYMERASE CHAIN REACTION HLA TYPING IN KIDNEY ALLOCATION PROCESS**

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### **AIM**

In the deceased donor kidney transplantation program in Croatia, as a part of Eurotransplant, typing for HLA-A, -B, -C, -DRB1 and -DQB1 loci is mandatory both for recipients and donors. Sensitized patients, especially those highly sensitized, often extend their sensitization to HLA antigens of additional loci (HLA-DRB3/4/5, -DQA1, -DPB1 and -DPA1). HLA typing without inclusion of those loci is leading to inaccuracies during the organ allocation process and prolonged period for allocation.

### **MATERIALS AND METHODS**

The real-time polymerase chain reaction method for 11 loci (HLA-A, -B, -C, DRB1, -DRB3/4/5, -DQB1, -DQA1, -DPB1 and -DPA1) is widely used as a sole method for HLA typing of deceased donors because of its simplified workflow. In the last six months, this method was introduced in the organ transplantation program in our Tissue Typing Centre. Potential DSAs are reported for each recipient at time of kidney allocation, with the assignment of the DSAs undertaken according to the donor's PCR-SSP or rtPCR HLA typing.

### **RESULT AND CONCLUSION**

Currently, among 307 patients on Eurotransplant kidney waiting list in Croatia, 116 (37.8%) patients are immunised, among which 38 (32.8%) of them are immunised against those additional HLA loci. The majority, 22/38 (57.9%), has HLA-DP antibodies, either only -DPA/B or in combination with other HLA class I or II antibodies. In the period of six months, 17 deceased donors were typed by rtPCR and kidney was offered to five highly sensitized patients. Three of them continued to transplantation due to beneficial additional typing results and for two patients, organ was rejected due to unacceptable HLA-DPB1 and allele specific -DRB3 antibodies. Extension of HLA typing with additional loci speeds the process of allocation, avoids unnecessary organ transportation, reduces cold ischemia time and provides valuable information for decision on pretransplant and postransplant immunosuppressive therapy. Finally, this should increase the effectiveness and graft survival.

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## OUTBREAK OF VIRAL HAEMORRHAGIC FEVER WITH RENAL SYNDROME IN CROATIA DURING THE COVID-19 PANDEMIC

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### AIM

Analysis of epidemiological and clinical data on the outbreak of viral haemorrhagic fever with renal syndrom in the Primorsko-Goranska County of Croatia in 2021, during the COVID-19 pandemic, to improve patient care.

### MATERIALS AND METHODS

We analyzed data on all  $\geq 18$ -year-old patients referred because of viral haemorrhagic fever with renal syndrom to the Department of Infectious Diseases and the Department of Nephrology, Dialysis and Kidney Transplantation of the Clinical Hospital Center Rijeka during the year 2021. Most of the patients presented with typical clinical course and laboratory findings, including a flu-like syndrom, thrombocytopenia and renal syndrome. In the patients with a non-specific course, the diagnosis was suspected based on epidemiological data and in most of the cases confirmed by detection of specific antiviral antibodies.

### RESULT AND CONCLUSION

In 241 (96.0%) out of 251 patients referred for treatment of viral haemorrhagic fever with renal syndrom, anti-hantavirus antibodies of the IgM class were detected against the Puumala virus (100.0%) and 7 patients also showed serological reactivity against the Dobrava virus. The other 10 patients were not tested, or test results are not available. Median patient age was 48 (range 18-79) and 175 (69.7%) patients were male. Due to the restraints induced by the Covid-19 pandemic, only 79 (31.5%) patients were hospitalized, while 172 (68.5%) were treated on an out-patient basis. Four patients experienced severe thromboembolic events during the reconvalescent phase. None of the patients died.

This was the largest outbreak of viral haemorrhagic fever with renal syndrom so far in Croatia, and the highest incidence has been observed in the Primorsko-Goranska County. The concurrent COVID-19 pandemic represented a challenge for the recognition of viral haemorrhagic fever due to similar initial signs and symptoms, and because of the need for stronger patient selection for in-hospital treatment. All patients recovered well.

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## HISTOLOGICAL DATA IN FIVE PATIENTS FOLLOWING A SARS-CoV-2 INFECTION

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### INTRODUCTION

The potential impact of SARS-CoV-2 on kidney is still undetermined and various kidney lesions are observed in patients with coronavirus. Renal biopsy (RB) is the best diagnostic tool for this impairment. We report the results of RB performed in 5 patients following SARS-CoV-2 infection.

### MATERIALS AND METHODS

Case 1: 18-year-old patient, presented one month after an infection with SARS-CoV-2 with acute renal failure (ARF) and bilateral anterior uveitis. The RB objectified an acute interstitial nephritis with a negative etiological assessment. Case 2: A 16-year-old patient, presented one month after a SARS-CoV-2 infection with asthenia, fever and ARF with bilateral anterior uveitis. His PBR showed acute interstitial nephritis. Case 3: A 45-year-old patient, presented one month after a SARS-CoV-2 infection, with flaccid tetraplegia revealing tubular acidosis with hypokalemia, as well as dry syndrome with positive anti-SSA and anti-SSB antibodies. The RB objectified acute interstitial nephritis. Case 4: A 39-year-old diabetic patient presented, in July 2021 during a SARS-CoV-2 infection, hypertension, thrombocytopenia and ARF. Under symptomatic treatment, blood pressure and platelets normalized but renal failure remained without proteinuria. In November 2021, she presented arthralgia related to Gougerot Sjögren's syndrome in front of grade 1 chronic lymphocytic sialadenitis and positive anti-SSA and anti-RO52 antibodies. The RB showed chronic arteriolar microangiopathy with an extensive glomerular sclerosis of the superficial cortex associated to an acute interstitial nephritis with vacuities. Case 5: A 54-year-old patient, presented with rapidly progressive glomerulonephritis two months after infection with SARS-CoV-2 with positive anti-glomerular basement membrane antibodies and extra-capillary glomerulonephritis with linear deposits of IgG on RB.

### CONCLUSION

Our five patients presented renal damage in a context of autoimmunity. Even if the accountability of the SARS-CoV-2 virus is difficult to establish with the means at our disposal, its pathogenic role seems possible given the chronology between the two conditions.

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## EFFECTS OF INTERDIALYTIC WEIGHT GAIN OF PATIENTS ON CHRONIC HAEMODIALYSIS ON CARDIAC TROPONIN LEVEL

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### AIM

Patients with end stage renal disease (ESRD) on hemodialysis have a significantly higher cardiovascular risk. Haemodynamic and volume changes in between 2 dialysis sessions can lead to constant cardiac burden and strain and might increase cardiac troponin levels. Haemodialysis patients can have a higher troponin values without acute coronary syndrome, which makes it more difficult to diagnose acute disorders. Higher weight gain could result with higher troponine values.

### MATERIALS AND METHODS

We analyzed the basal troponine values of haemodialysis patients on their first weekly treatment and correlated them with weight gain from last dialysis session (as a percentage of planned „dry body weight”), cause of chronic kidney disease, comorbidities and to the duration of CKD and dialysis treatment. Data of 63 patients on chronic haemodialysis in Dubrava University Hospital was collected retrospectively, including medical history, laboratory tests and dialysis protocols.

### RESULT AND CONCLUSION

Overall, 69.60% were male, average CKD duration was 8,4 years, and average hemodialysis duration was 4,2 years. 95% had anemia, 92% had hypertension, 48% had diabetes and 57% had cardiovascular disease. The average absolute weight gain was 2,72 kg, and the average percentage of weight gain was 4%. The average basal troponin I level was 25.5 ng/L (with a wide range 6-121,8 ng/L). There was no statistically significant correlation between fluid (weight) gained between two dialysis sessions and basal troponin I level, neither for absolute or relative value of weight gain. Duration of CKD and haemodialysis did not significantly correlate with basal troponin I levels, but duration of HD significantly correlated with the percentage of weight gain. There were no significant differences in troponin I levels regarding CKD cause nor different comorbidities, although the result was close to statistical significance for arterial hypertension and myocardial infarction in previous medical history. Interdialytic weight gain does not affect basal troponin I level.

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## THE EFFECTIVENESS OF A MEDIUM CUT OFF DIALYSER (THERANOVA) IN HEMODIALYSIS PATIENTS

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### AIM

The aim of this study was to compare the use of the medium cut off membrane Theranova and hemodiafiltration (HDF) in hemodialysis patients.

### MATERIALS AND METHODS

12 prevalent patients older than 18 years treated with HDF participated in this cohort pilot study. Patients with cachexia or cancer were excluded. Patients were equally divided into two groups, with similar demographic characteristics and followed up for a period of 3 months. Patients in Group 1 were treated with Theranova dialyzer (Baxter USA) for a period of 30 days, and patients in Group 2 continued their regular treatment with hemodiafiltration. Their clinical, biochemical, and body composition parameters were followed up every 4 weeks, and measurements were taken for assessing protein energy wasting syndrome - PEW (Fouque et al.) as one of the primary outcomes together with number of hospitalizations.

### RESULT AND CONCLUSION

Serum albumin levels were maintained in both groups during the study. No difference toward blood pressure were observed between groups, but a statistical reduce in diastolic blood pressure was noticed in the Group 1 after the followed-up period ( $p=0.04$ ). Hematological parameters did not significantly differ between the groups except for hematocrit which was significant lower in the HDF group after the study ( $p=0.034$ ). CRP was significantly lower after the follow-up period in Group 1 ( $p=0.034$ ). Patients had a higher hospitalization rate in Group 2 ( $p=0.019$ ), with a significant relation between the dialysis modality and time to hospitalization ( $p=0,047$ , HR=9.917). More patients in the HDF group developed PEW, but this difference was not statistically significant. This study demonstrated that the use of Theranova does not cause hypoalbuminemia and has the ability to reduce blood pressure and inflammatory markers. It showed its protective role in reducing the number of hospitalization and further trials with longer treatment periods and larger sample sizes are needed to prove their other beneficial roles.

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## **NEW-FOUND MALIGNANCY AND NODAT (NEW ONSET DIABETES AFTER TRANSPLANTATION) IN FEMALE PATIENT TREATED WITH IMUNOSUPPRESSIVE THERAPY AFTER KIDNEY TRANSPLANTATION**

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### **AIM**

Patients on immunosuppressive therapy, including cyclosporine and therapeutic regimens including cyclosporine are at higher risk of developing malignancy than their peers who are not on immunosuppressive therapy. Malignancy rate goes up especially with higher intensity and therapy duration.

### **MATERIALS AND METHODS**

Case report study.

### **RESULT AND CONCLUSION**

Female patient, 61 years old, treated with kidney transplantation from cadaver in Moscow in 2008. Data on immunosuppressive therapy protocol conducted in Moscow is inconclusive. The patient was on immunosuppressive therapy with: cyclosporine, mycophenolate mofetil, prednisone with normal graft function. Year after renal transplantation the patient developed NODAT (New Onset Diabetes After Transplantation). In the beginning she was treated with oral antidiabetic drugs, then after development of ketoacidosis and poor management of blood glucose level the patient continued treatment with insulin analogues. In 2013 the patient was diagnosed with breast cancer in the right breast. Mastectomy was performed on the right side, after staging of carcinoma was performed there was no indication for other therapy modules to be used. The patient remains in remission after therapy. In April of 2015. the patient was diagnosed with Granular cell carcinoma of the right ovary. Complete hysterectomy and bilateral adnexectomy was performed. Again, after staging was performed there was no indication for continuing therapy with any other therapeutic modalities. Imaging methods performed in October of 2015 confirmed no signs of primary disease. The patient was regularly controlled by oncologist. Oncological consilium didn't suggest any adjuvant treatment after operation. In November of 2015 patients immunosuppressive treatment was changed from cyclosporine to sirolimus. Then values of urea and creatinine were 9.8 and 181mcmol/l respectfully.

Special monitoring and dosage regulation in patients on immunosuppressive therapy are needed as there are many side effects and increased risk of malignancy in this population.

## VARICELLA HAEMORRHAGICA IN FEMALE PATIENT TREATED WITH IMMUNOSUPPRESSIVE THERAPY AFTER KIDNEY TRANSPLANTATION

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### AIM

Patients on immunosuppressive therapy are at higher risk of contracting viral infections than their peers who are not on immunosuppressive therapy. Due to this type of treatment even benign viral infections could lead to a fatal outcome.

### MATERIALS AND METHODS

Case report study.

### RESULT AND CONCLUSION

The patient is a 33-year-old female who presented with skin lesions covered with dark crust surrounded by erythema located on the capicilium, extremities and trunk 8 days before admission in December of 2019. Previously the patient had multiple liquid stools that lasted for one month before admission. Infectologist and dermatologist were consulted. Stool samples turned out positive for Candida. She states that her child had Varicella and that she also had it as a child. PCR test was positive for Varicella Zoster Virus. Adequate therapy was administered, and the patient felt improvement in her condition. In April of 2006 our patient was diagnosed with chronic renal failure. Biopsy of the kidney was performed the same year and the results confirmed IgA nephropathy was present. In October the patient started hemodialysis and received a kidney via transplantation from a living donor (her mother) in December of the same year. Four years after that the graft was rejected and retransplantation was performed in 2017 from a cadaveric donor in Moscow. Data on immunosuppressive therapy protocol that was conducted in Moscow is inconclusive. The patient gave birth to twins in 2018. At the time of clinical presentation, the patient was on immunosuppressive protocol with mycophenolate mofetil and tacrolimus.

Patients on immunosuppressive therapy should be advised to follow the epidemiological situation of their surroundings. Discipline and caution should be exercised when in contact with possible contagious family members or others.

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## EARLY SURGICAL COMPLICATIONS IN KIDNEY TRANSPLANT PATIENTS

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### AIM

The aim is to point out the importance of early detection of complications.

### MATERIALS AND METHODS

Case report study.

### RESULT AND CONCLUSION

A 32-year-old patient from Montenegro was treated at the Clinical Center of Montenegro with the method of live related kidney transplantation in November 2018. The patient was diagnosed with end-stage renal failure in January of the same year when he presented with hypertension and uremic syndrome. The patient was treated with renal replacement therapy - hemodialysis, which was continued until transplantation. After adequate preparation, a kidney transplant was performed from a living related donor on November 21, 2018. The organ donor was an aunt. The intervention went smoothly and without complications. In the early postoperative period, due to anuria and an increase in arterial blood pressure, graft Doppler sonography was performed, where low-resistant intrarenal arterial flows were verified, slowing down the reaching of the systolic peak. The spectral curve has the characteristics of poststenotic "parvus tardus" flows. In order to differentiate the seen changes in the circulation, an MSCT graft was performed, where the subtotal stenosis of the lumen of the renal artery at 3 mm from the anastomosis was verified. The kidney intensifies postcontrast. No signs of renal artery and vein thrombosis. The patient was immediately taken to the operating room for surgical reintervention, after which proper circulation was obtained at the control Doppler findings. The patient achieved good hourly diuresis below. The graft function is kept tidy.

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## POST-TRANSPLANT HLA DONOR-SPECIFIC ANTIBODIES MONITORING IN KIDNEY TRANSPLANT RECIPIENTS WITH PRE-TRANSPLANT DONOR-SPECIFIC ANTIBODIES – CASE REPORT

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### GOALS

Pretransplant donor-specific antibodies (pre-tx DSA) are associated with an increased risk of antibody-mediated rejection (AMR) and allograft loss. Following transplantation (tx), the level of DSAs may increase, decrease, remain persistent or be completely cleared from the recipient's blood and thus should be carefully and continuously monitored in the post-transplant period.

### MATERIALS AND METHODS

The patient was a 46-year-old male waitlisted in September 2019 for the second kidney tx. The presence of HLA antibodies detected with the Luminex Single Antigens beads method (LSA1, LSA2) for HLA class I and class II antibodies showed that the patient was highly immunized, with a highest virtual panel of reactive antibodies (vPRA) of 92%. The complement-dependent cytotoxicity (CDC) PRA at the time of tx was 44% pointing to the presence of cytotoxic complement binding HLA class I antibodies.

### RESULTS

In January 2020, the patient received kidney offer from cadaveric donor. The donor/patient ABCDRDQ mismatch was 21011, with Luminex results positive for the presence of pre-tx HLA class I DSAs with low median fluorescence intensity (MFI: 1300-1700). The CDC crossmatch was negative, excluding the presence of cytotoxic HLA class I DSAs. The plasmapheresis was performed and Luminex test results turned negative for the presence of pre-tx DSAs. The tx was carried out and the patient continued to be carefully immunologically monitored. Seven months after tx, the pre-tx existing DSAs reappeared with the same low MFI values as before tx and persisted equally positive till today. The kidney function is stable, without the episodes of AMR.

### CONCLUSION

The decision about performing tx with pre-tx DSA present should be made carefully and detailed pre-tx and especially post-tx DSA monitoring are important to improve individual risk stratification for kidney allograft loss.

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## SEVERE RHADOMYOLYSIS AND HEMOLYTIC - UREMIC SYNDROME (HUS) CAUSED BY COVID 19 VACCINATION - CASE REPORT

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### AIM

To show the state of severe rhabdomyolysis and HUS as complications arising after vaccination against Covid-19 (Pfizer and Astra Zeneca vaccines in combination given to the patient). Cases of rhabdomyolysis and hemolytic uremic syndrome are described during the administration of different vaccines against Covid-19 (Moderna, Astra Zeneca and Pfizer). Rhabdomyolysis potentially associated with the COVID-19 vaccine supports the possibility that autoimmunity is a major risk factor for its occurrence.

### MATERIALS AND METHODS

We present the case of a 49-year-old man who was hospitalized ten days after the second dose of the Pfizer vaccine (the first dose was Astra Zeneca) due to rhabdomyolysis (CK 5751 U/L), hematuria, oliguria, thrombocytopenia (PLT 12), high values of D-dimer (11.2), elevated liver enzymes (LDH 726 U/L), uremia (serum creatinine 1068 umol/L), schizocytes in peripheral blood smear, necrotic changes of nose, feet, right wrist and testicles. Patient didn't have previous comorbidities and had no chronic therapy. He didn't have neurological manifestations. Patient was treated daily with unfractionated heparin, fresh frozen plasma, antibiotics, Solu-Medrol and daily hydration up to 2 liters per day. He also had ten therapeutic apheresis with fresh frozen plasma and three hemodialysis sessions. Other bacteriological, serological tests, urine cultures, blood cultures remained sterile.

### RESULT AND CONCLUSION

Recovery of kidney function eventually started, with a drop of creatine kinase to 300 U/L, creatinine 123 umol/l. Necrotic changes were treated by an angiologist and orthopedist, with eventual partial amputation of both feet. How and why some patients develop rhabdomyolysis after the Covid-19 vaccine is still not clear. There are no blood tests available that can determine a direct causal link. Messenger RNA in vaccines enters the cytoplasm of the host and begins to produce surface spiked proteins, which represent antigens, creating an immune response against the virus itself.

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## AKI AS A RARE COMPLICATION OF VASCULITIS PRESENTED AS HYPERTENSIVE TOXIC-METABOLIC ENCEPHALOPATHY

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### AIM

Acute kidney injury (AKI) is rare in children. Its symptoms can be very mild, like minimal elevation in serum creatinine to anuric kidney failure. Causes are multiple, but the risk of AKI increases for children and neonates who require intensive care, those who receive nephrotoxic drugs and those who have underlying chronic diseases.

### MATERIALS AND METHODS

We present a case of a 17-year-old autistic boy who has developmental delay and epilepsy, only using valproate in therapy. His symptoms started with oliguria. Later he developed several grand mal attacks as a consequence of high blood pressure and was hospitalised in Dubrovnik. Grand mal was ceased with diazepam. Initial laboratory findings showed anaemia with high BUN (urea 45.9 mmol/l, creatinine 1567 µmol/l). Kidney ultrasound showed some mild parenchymal oedema. The diagnosis of AKI was established. Conservative therapy was started with enalapril, while furosemide and amlodipine were added later. Despite therapy, patient continued to deteriorate: attacks repeated, he started vomiting, was hypertensive with RR 190/123 mmHg, without contact, groaning, pale. A brain MSCT was done and showed changes characteristic for toxic-metabolic encephalopathy bilaterally in the deep white matter. At this point, he was transferred to our PICU in Split. At the arrival he was comatose, with extremely high blood pressure, tachycardic and anuric. We immediately started antihypertensive treatment and continuous veno-venous hemodiafiltration (CVVHDF). An extensive diagnostic work up was done. The PHD described acute tubulointerstitial nephritis and possible acute postinfective glomerulonephritis as a possible consequence of his dental problems. However, there were also blood vessels changes in context of polyarteritis nodosa together with high AST-O titer in blood. Therefore, plasmapheresis was added to the therapy.

### RESULT AND CONCLUSION

Consequently, the boy gradually recovered, started to urinate, and was transferred to the nephrology department. Because of necessity for further diagnostic work up, the patient was transferred to Zagreb.

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## DIFFERENCE IN CLINICAL PRESENTATION AND OUTCOME AMONG COVID-19 PATIENTS ON CHRONIC HEMODIALYSIS TREATED IN DUBRAVA UNIVERSITY HOSPITAL DURING TIME

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### AIM

Dubrava University Hospital, in Zagreb, Croatia was until summer 2021. the only referral center for COVID-19 patients in the capital of Croatia who were on chronic hemodialysis program and affected by SARS-CoV-2 virus. Between September 2020 and June 2021, we dialysed 128 patients (group 1) and in the period starting from September 2021 until April 2022, 47 patients (group 2). We observed significant differences in the clinical presentation and outcomes of the two patient groups.

### MATERIALS AND METHODS

Patients were stratified in groups according to disease severity classification, while we put asymptomatic patients in category 0. Overall, 17% of patients from the first group were asymptomatic, 38% had mild disease, 32% had moderate disease and 13% had severe/critical clinical presentation of the COVID-19 disease. As many as 60% of patients had x-ray verified pneumonia, which was in 42.9% of the cases bilateral. 37% of patients required a low dose oxygen therapy while 4.7% were on high-flow oxygen therapy or mechanical ventilation. The second group was asymptomatic in 25% of cases while 42.5% had mild clinical presentation. 15% of patients had moderate and 17% severe/critical clinical presentation. Only 34% of patients had pneumonia and in the case of 28% of patients it was bilateral. 20% of patients required low dose oxygen therapy, and only 2% HFOT while none of the patients required mechanical ventilation. The second group had less hospitalized patients (27% vs 51%), less thromboembolic incidents (2% vs 7%) and significantly lower mortality (6% vs 17%) compared to the first. COVID-19 was not the primary reason for death of chronic hemodialysis patients in the second group of patients.

### RESULT AND CONCLUSION

Our observation of better outcomes and milder clinical presentation of patients in the second part of COVID-19 pandemic is, among other, influenced by less aggressive virus types and high percentage of immunization among our patients.

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## EFFECT OF PLASMAPHERESIS ON HYPERTRIGLYCERIDEMIA

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### AIM

Triglycerides are a type of lipids, esters derived from glycerol and fatty acids. We import them by food, and they are stored in adipose cells (energy storage). The most important enzyme for triglyceride digestion is lipase (mostly pancreatic, less than 10% lingual). Elevated triglycerides are associated with a variety of metabolic changes that can lead to different chronic diseases (diabetes, metabolic syndrome, cardiovascular diseases). Also, hypertriglyceridemia (HTG) is the third most common cause of acute pancreatitis (after gallstones and alcoholism). Hypertriglyceridemia is classified by the value of blood triglyceride levels. Normal values are less than 1.7 mmol/L, mild HTG is defined by triglycerid levels of 1.7-5.6 mmol/L, high HTG by levels of 5.65-11.3 mmol/L, and very high levels over 11.3 mmol/L. With very high HTG there is a higher risk of acute pancreatitis that could lead to a mortality chance of 30%. Treatment includes intravenous hydration, diet, medications. Plasmapheresis is an extracorporeal procedure that can remove components of plasma. Although it is not the first line of treatment for HTG (category III for HTG pancreatitis), plasmapheresis can significantly reduce triglyceride levels, and with just one procedure.

### MATERIALS AND METHODS

In Dubrava University Hospital plasmapheresis procedures were done recently on 2 patients with very high hypertriglyceridemia. The first patient presented with elevated liver enzymes, without acute pancreatitis, and triglyceride level of 76.4 mmol/L. The second patient had triglyceride level of 72.8 mmol/L and acute pancreatitis (biochemistry, MSCT). Both patients were admitted to the intensive care unit and a single plasmapheresis procedure was done with 1 plasma volume of albumin replacement fluid. Triglyceride levels reduced in both patients, 8.2 mmol/L and 13.1 mmol/L respectively.

### RESULT AND CONCLUSION

After plasmapheresis procedures significant triglyceride reduction was noted and good clinical course followed. It can be assumed that the procedure fastened the patients recovery and shortened the length of hospitalization.

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## PREDICTION OF THE OUTCOME OF IGA NEPHROPATHY BASED ON THE COMBINATION OF HISTOLOGICAL AND CLINICAL GRADE OF THE DISEASE

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### AIM

IgAN is defined as an autoimmune disease characterized by the deposition of immunocomplexes containing Gd-IgA1 antibodies in the glomerular mesangium. The aim was to create a scoring system based on a combination of histological lesions according to Oxford classification and clinical parameters that would assess the risk of developing ESRD in patients with IgA nephropathy.

### MATERIALS AND METHODS

The study included patients whose eGFR value at the time of biopsy was  $>15$  ml/min/1.73 m<sup>2</sup>. Patients with secondary IgAN were excluded. The observation period was 3 years or less if ESRD development, dialysis or death occurred. The previous three criteria also formed the end point of the study.

### RESULT AND CONCLUSION

This study found that the group with the development of ESRD had a lower value of eGFR at the time of biopsy compared to those without the development of the same ( $p=0.003$ ). For the group with T1+2 criteria, a higher frequency of ESRD development was proven compared to the group with T0 criteria ( $p=0.025$ ). ROC curve analysis, for eGFR values at the time of biopsy, resultated with an AUC of 0.844 (95% CI 0.657-0.952) ( $p<0.001$ ) with the breakdown value of  $\leq 44$  ml/min/1.73m<sup>2</sup>. Univariate analysis by logistic regression, with a breakdown value eGFR of 0.05). Patients are more likely to develop ESRD if the eGFR value, at the time of biopsy, is  $<44$  ml/min/1.73m<sup>2</sup> and/or the pathohistologically confirmed T1+2 criteria.

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## **COVID 19 AND TRANSPLANTED KIDNEY CLINICAL EXPERIENCES, SARS CoV2 INFECTION IN KIDNEY TRANSPLANT PATIENTS**

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### **AIM**

SARS CoV2 infection, as in the general population, has been frequent throughout the COVID19 pandemic even among transplanted patients. COVID-19 disease is manifested by variability in the clinical picture in transplanted patients, from mild to very severe cases, accompanied by allograft nephropathy, loss of graft function and lethality. Immunosuppression and antiviral therapy, in severe and critical forms of the disease have been the main points of treatment, but at the same time have revealed dilemmas between attempts to maintain renal graft function and cytokine storm with severe respiratory disease management.

### **MATERIALS AND METHODS**

Material: sixteen transplanted patients with COVID19 infection. Methodology: descriptive, comparative study in a series of 16 clinical cases, with transplant patients and COVID19 infection, divided into two groups: a. patients with normal renal graft function and b. patients with allograft nephropathy of various stages.

### **RESULT AND CONCLUSION**

Results: 5 patients have lost the graft, 3 of them died, 2 continued with iHD, 3 with temporary iHD and back to baseline creatinine, 8 ambulatory cases, 5 acute rejection, all of them back to baseline creatinine. Conclusions: Maintaining renal graft function in cytokine storm and severe COVID-19 infection along with triple immunosuppression in kidney transplanted patients has been a very major challenge to manage and access to immunosuppressive and antiviral therapy has been determinant for the clinical course of the disease, as well as maintenance or loss of renal function. However, reduction of immunosuppressants but not discontinuation have been shown to play a key role in renal graft survival, return to baseline creatinine and/or normal graft function.

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## ACUTE KIDNEY INJURY IN LEPTOSPIROSIS

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### AIM

Leptospirosis is a zoonotic infection, spread all over the world caused by leptospira, a spirochete that mostly affects liver and kidney. A common complication that needs to be alert is AKI, a lifethreatening condition. It is characterized by tubular interstitial nephritis and tubular dysfunction. The most frequent form of leptospiral nephropathy is hypokalemic and nonoliguric form. We have studied the incidence of LAKI in Albania along with the renal injury in two leptospiral phases.

### MATERIALS AND METHODS

50 patients diagnosed with Leptospirosis complicated with AKI were admitted at Infection Diseases Department and Nephrology department of Mother Teresa Hospital in Tirana between 2017-2020. This was a retro and prospective study. All patient's data were evaluated by their charts. Statistical analysis was performed using SPSS 20, linear regression. Elisa test was used for confirmation of leptospirosis infection and KDIGO classification for AKI diagnosis.

### RESULT AND CONCLUSION

Incidence Of AKI in Leptospirosis was 40 %. 86% of patient were male. The most frequent age was 51-56 and SD 51.4±12.69. Leptospirosis AKI was mostly hypokalemic and nonoliguric. Mortality was 12 % and only 16% of all patients needed hemodialysis treatment. Serum BUN, creatinine, bilirubine, potassium and thrombocytopenia levels were higher in acute phase than in immune phase. In the acute and immune phase WBC and PLT were independed risk factor of AKI ( $p>0.005$ ). Mean value of WBC in acute phase was 10416/mm<sup>3</sup> and in immune phase 9056/mm<sup>3</sup> ( $p<0.003$ ). Mean value of PLT was 82000/mm<sup>3</sup> in acute phase and 190000/mm<sup>3</sup> in imunne phase ( $p<0.0002$ ). In acute phase was a positive relation of bilirubinemia and azotemia ( $r=0.369$ ) and with creatinemia ( $r=0.339$ ) In immune phases there was a positive relation of bilirubina with azotemia ( $r=0.882$ ) and creatinemia ( $r=0.540$ )

Conclusion: We concluded that LAKI is an actual problem for nephrologists in Albania and it is really important early and adequate treatment to have a good prognosis.

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## A RISK FACTOR FOR A DEVELOPMENT OF A CARDIOVASCULAR DISEASE BY HEMODIALYSIS PATIENTS WITH MICROINFLAMMATION

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### AIM

To determine the concentration of hs-CRP in hemodialysis patients in the control group to compare the concentration of hs-CRP concentration in hemodialysis patients with hs-CRP participants in the control group, comparable concentrations of hs CRP in patients with and without cardiovascular complications and to determine the incidence of cardiovascular disease on hemodialysis compared to traditional risk factors.

### MATERIALS AND METHODS

The group of 20 patients, mean age 57.5 years, 15 males with an average age 57.5 years, a group of five women's average age of 54.8 years, treated by repeated dialysis treatment in the General Hospital in Berane in 2018 and 2019, control group of 10 subjects (8 males and 2 females), mean age 50.7 years, while 8 of them were male with an average age 52.75 years, while two were female with an average age 42.5 years, who belong to a healthy population.

### RESULT AND CONCLUSION

20 patients on hemodialysis, the mean concentration was hs-CRP-67 ±20.8 mg was significantly higher than in the reference value in the control group ranged 16.2 ±3.9mg/l, and between these two groups there was a statistically significant difference. 10 hemodialysis patients with cardiovascular complications, the mean concentrations of hs-CRP was 75.3 ±31.78 mg/l, with the remaining 10 patients on dialysis without complication was conc. hs-CRP 82.45±24.65 mg /l between these two groups there was no statistically significant difference. 10 hemodialysis patients with cardiovascular complications of 100% have hypertension. hyperlipidemia 30%, 20 % of the patients with diabetes, 30% of the smoking and obesity have 30%. The concentration of hs-CRP in patients on hemodialysis was significantly increased compared to the control group, which belongs to the healthy population, The concentration of hs-CRP in hemodialysis patients with cardiovascular complications was not significantly elevated compared with no complications. The incidence traditional and non-traditional risk factors can reduce the incidence of complications.

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## ASSESSMENT OF PATIENT ADHERENCE IN PRE-TRANSPLANT PROCESSING

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### INTRODUCTION

The outcomes of medical treatment, increased mortality and morbidity, rehospitalizations and the cost of procedures are largely subordinated by the degree of patient adherence, which is manifested in implementation of recommendations and instructions in taking medications. For the time being there are no explicit guidelines or completely reliable tests that could be used to detect a potentially non-adherent patient. The aim of our presentation is to point out the importance of recognizing less adherent patients during screening and diagnostic processing for the kidney transplant waiting list and resolving or minimizing observed contributing factors.

### CASE PRESENTATION

A 44-year-old patient with arterial hypertension, chronic kidney disease, treated with hemodialysis for the past 4 years when he was transplanted, was admitted through the emergency department due to shortness of breath and edema of the lower extremities. X-ray of the heart and lungs shows an extensive right-sided pleural effusion, ultrasound of the abdomen reveals extensive ascites, while laboratory findings show anemia (Hb 107 g/L) with urea 39.0 mmol/L, creatinine 656 umol/L, potassium 5.3 mmol /L. Anamnesis and hetero-anamnesis revealed that the patient absolutely refused and did not respond to calls for follow-up examinations by a nephrologist. Due to graft insufficiency, hemodialysis was started with a good clinical effect. After two years of repeated treatment with hemodialysis due to earlier graft loss as a result of non-adherence, the patient is again being processed for transplantation with previous psychological testing and supervision by a psychiatrist.

### CONCLUSION

Adherence to treatment plays a crucial role in the outcomes of transplanted patients. In addition to treating patients through regular check-ups, our focus should also be on detecting poorly adherent patients. Identification of these patients even in pre-transplant processing, interdisciplinary approach that includes additional work with the patients and their families through re-education, improvement of communication with additional involvement of the competent physician and cooperation with the pharmacist in dispensing the prescribed medicine could help reduce this problem.

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## ABDOMINAL AORTAE OCCLUSION CAUSED BY TUMOR OF RENAL - CASE REPORT

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### AIM

Abdominal aorta is the part of the aorta that passes through the abdominal cavity. Important branches of the abdominal aorta include the arteries that supply blood to the intestine (celiac artery and superior and inferior mesenteric arteries); kidneys (renal arteries) and legs (iliac arteries). Occlusion is blockage or narrowing one of the branches. Occlusion may develop suddenly (acute occlusion) or slowly.

### MATERIALS AND METHODS

A 58-year-old man was diagnosed with neoplasma malignum in left renal, diameter 145x115mm.. He underwent the subcostalis laparotomic radical nephrectomy for left renal and lymphadenectomy paraaortalis left. Other part of operation was sutures direct on abdominal aorta because renal tumor infiltrated it. First postoperative day, patient did not feel his legs and did not have motor activity in them. Computer tomography revealed occlusion of abdominal aortae in place that represent postoperative place, in level of separation the left renal artery from aorta. It showed a soft tissue in lumen with defect of lumen, about 3,5 cm length and the blood flow under defect was 3-4mm. The right renal artery was narrowed lumen at the place of separation of the aorta, but the hole lumen was narrowed by the hematoma paraaorta. There was also defect in a artery mesenterica lumen, approximately 1cm length. The pathological result showed carcinoma lucidocellulare renis (CCRCC), gradus IV secundum Furhman; pT3aN0Mx; L1V1.

### RESULT AND CONCLUSION

After 20 days at Intensive care unit, patient was treated with medicines and last computer tomography showed adequate flow through the aorta, that responded with operations defect. Unfortunately, after 30 days at Intensive care unit, patient died with several complications - melena, radiography diagnosed pleural effusion, hemodynamic instability, ascites, sepsis and cardiac arrest.

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## IMMUNIZATION IN KIDNEY TRANSPLANTATION

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### AIM

Immunization towards Human Leukocyte Antigens (HLA) can occur through pregnancy, blood transfusion, or previous transplant. Determination of unacceptable and acceptable HLA antigen mismatches is a critical decision step in finding a suitable donor for the HLA immunized kidney recipients. The Eurotransplant Acceptable Mismatch (AM) program enhance transplantation of highly sensitized patients by allocating the kidney from the donors with HLA antigens to which the patient has never formed the antibodies. Here, we present the characteristics of a cohort of 56 active and immunized patients (34 male and 22 female) on kidney transplant waiting list on 1st of July 2022.

### MATERIALS AND METHODS

Among 56 immunized patients, 28 (50%) had a previous transplantation, 14 of them as the only immunizing event, 11 received transfusion as well, while 3 female patients also had a pregnancy as the third immunizing event. A total of 30 (54%) immunized patients have the immunization to both class I and class II HLA antigens, 19 (34%) patients have only HLA class I immunization and 7 (12 %) are immunized only to class II HLA antigens. In the terms of virtual panel reactive antibodies (vPRA), 15 patients have vPRA over 98%, which makes them eligible for AM program. Among them, 14 patients (93%) had previous transplantation as the main immunizing event. Three of these patients are already registered in AM program, while five more are in a process of the registration.

### RESULT AND CONCLUSION

All together the HLA immunization profile of our patients is pointing to the previous transplantation as a major event leading to the high immunization that makes the patient eligible for the AM program. This also emphasizes the importance of donor-recipient HLA matching in the first transplantation, especially for children and young patients in which second transplantation is expected in the future.

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## ADULT CONGENITAL HEART DISEASE, KIDNEY TRANSPLANTATION, ACHD

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### AIM

Congenital heart disease accounts for 1/3 of all congenital anomalies. Due to abrupt development of medicine in last two decades number of adults with congenital heart disease is increasing. Almost 50% of these patients have decreased kidney function and the prevalence of chronic kidney disease is 18-35 times higher compared to general population. According to our knowledge there is no data on renal replacement therapy in this population. The aim of this study is to present for the first time results on kidney transplantation in patients with ACHD.

### MATERIALS AND METHODS

We retrospectively analysed medical records of all kidney transplant recipients between August 2007 and December 2021. Characteristics and outcomes of patients with ACHD were investigated.

### RESULT

Of 1200 patients who received kidney allograft seven patients had diagnosis of adult congenital heart disease. There were four women and three men. Two patients had aortic coarctation, one patient had bicuspid aortic valve, two had ventricular septal defect with one of them having associated atrial septal defect and two patients had atrial septal defect. Two patients, both with aortic coarctation underwent cardiac surgery prior kidney transplantation. There were various causes of kidney failure. Two patients had biopsy proven glomerulonephritis, one patient had Turner syndrome, one had hypoplasia of both renal arteries, one patient had nephroblastoma, one had vesicoureteral reflux and one patient was diagnosed with adult polycystic kidney disease. Mean dialysis vintage was 4.5 years (1.5-10 years). Average age at the time of kidney transplantation was 33.7 years (16.2-63.1 years). All patients received standard immunosuppressive therapy. Average follow up after transplantation was 5.8 years (0.2-12.1 years).

### CONCLUSION

Patients with adult congenital heart disease should be considered candidates for kidney transplantation. Increasing number of these patients imposes the need of further, larger studies.

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## GUILLAIN-BARRÉ SYNDROME AFTER SARS-CoV-2 INFECTION IN KIDNEY TRANSPLANT RECIPIENTS

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### AIM

SARS-CoV-2 virus predominantly affects respiratory tract and patients with acute infection typically present with respiratory symptoms. However other organs and organ systems can be affected and there is evidence of neurological involvement. Recent studies show that up to 80% of patients with severe COVID-19 present with neurological symptoms. Post-infectious Guillain- Barré syndrome (GBS) usually occurs sporadically. Recently numerous case reports/series report cases of GBS linked to SARS-CoV-2 infection. To date there are no reported cases on GBS in kidney transplant recipients and here we report two cases.

### MATERIALS AND METHODS

We report two cases of Guillain- Barré syndrome in kidney transplant recipients. Data is obtained from patients' medical charts and records.

### RESULTS

**Patient 1:** At the age of 64, a female patient received a kidney from a deceased donor. She received standard immunosuppressive therapy with basiliximab induction, tacrolimus, MMF and steroids. Early posttransplant course was uneventful and in later posttransplant period she had myocardial infarction and atrial fibrillation. Kidney graft function was normal. Seven years after transplantation she presented with severe SARS-CoV-2 infection after receiving two doses of mRNA vaccine. Fourteen days after positive SARS-CoV-2 swab the disease was complicated with typical clinical presentation of GBS with high titer of antiganglioside antibodies. Patient declined specific treatment.

**Patient 2:** A 60-year-old male patient received a kidney from a deceased donor with a standard immunosuppressive therapy. Early and later posttransplant course were uneventful with good kidney graft function. 18 months after transplantation he presented with severe SARS-CoV-2 infection with bilateral pneumonia. Ten days after positive swab he presented with GBS. He was successfully treated with IVIG and steroids.

### CONCLUSION

SARS-CoV-2 is possible trigger for GBS. Clinical course, presentation and treatment in kidney transplant recipients is similar to that in general population. Larger studies on kidney transplant population are needed.

## IMPLANTABLE CARDIOVERTER DEFIBRILLATOR, SUDDEN CARDIAC DEATH, KIDNEY TRANSPLANTATION, VENTRICULAR ARRHYTHMIA

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### AIM

Cardiovascular diseases including arrhythmias and sudden cardiac death (SCD) are the leading cause of death with functioning graft in kidney transplant recipients (KTR). Implantation of a cardioverter-defibrillator (ICD) is the first-line treatment option for secondary and primary prevention of SCD. Data of the ICD in patients with end-stage renal disease is scarce. There is no data in the literature about patients with ICD and kidney transplantation. We present our experience.

### MATERIALS AND METHODS

We retrospectively analysed medical records of patients receiving kidney transplant between December 1999 and December 2021. Characteristics and outcomes of patients with implantable cardioverter defibrillator were investigated.

### RESULT

Of 1689 patients who received kidney allograft seven patients underwent ICD implantation. There were six males and one female. In two patients cause of kidney failure was unknown, one patient had adult polycystic kidney disease, one patient had nephroangiosclerosis, one tubulointerstitial nephritis, one patient had vesicoureteral reflux and one had Balkan endemic nephropathy. Mean dialysis vintage prior kidney transplantation was 3.5 years (0.7-8.5). Average age at the time of transplantation was 55.4 years (44.3-66.6). Indication for ICD implantation was primary prevention of SCD due to ischemic cardiomyopathy in 4 patients, dilatative cardiomyopathy in two patients and sustained VT in one patient. Mean time of ICD implantation after transplantation was 6.3 years (1.8-16.2) with one patient undergoing ICD implantation 3.2 prior kidney transplantation. Average age at the time of ICD implantation was 61.7 years (51.5-69.4). During average of 4 years of follow up (1.3-6.5) kidney graft function remained stable in all patients. Three patients experienced cardiovascular complications and one patient died.

### CONCLUSION

Carefully selected patients with ESRD may benefit from ICD implantation and may preserve renal allograft function. Further studies are needed to prevent exclusion of kidney transplant recipients from this important and life-saving procedure.

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## COVID-19 AS A TRIGGER FOR ATYPICAL HUS RELAPSE

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### AIM

We present a case of a 28-years old female patient, who was diagnosed with COVID-19 with mild symptoms but was admitted to the hospital because of laboratory signs of microangiopathic hemolytic anemia, thrombocytopenia and acute kidney injury. As a child she had two similar episodes that were treated with infusions of fresh frozen plasma with full recovery. Differential diagnoses included thrombotic thrombocytopenic purpura (TTP) and atypical hemolytic-uremic syndrome (aHUS).

### MATERIALS AND METHODS

The treatment was started with therapeutic plasma exchange and corticosteroids. Soon her ADAMTS-13 activity and Shiga toxin results excluded TTP or typical HUS, and no secondary etiology was found.

### RESULT AND CONCLUSION

A kidney biopsy was performed and demonstrated active thrombotic microangiopathy with no other pathology on light and immunofluorescence microscopy. In the analysis of blood samples, the terminal pathway activation marker level was significantly increased. The C5 complement component inhibition therapy was not started immediately because of the uncertainty of COVID-19 circumstances, and more importantly she had a good response to current therapy. She was dismissed with an ACEI because of proteinuria (up to 4.42 g/day, without nephrotic syndrome). One month after the onset of the disease, she no longer had laboratory signs of active disease, and her renal function results improved. Genetic analysis showed that the patient is a homozygous carrier of a pathogenic splice site variant in the gene for MCP (CD46c.286+2T>G) and also a carrier of multiple common risk variants of complement alternative pathway dysregulation. Since COVID-19 coincided with this episode, it is very likely the trigger for this aHUS relapse. Considering the nature of MCP mutation's effect, the remission might have actually been spontaneous. Nevertheless, since relapses are possible, ravulizumab therapy was started, and her laboratory results are after half a year completely normal.

## FGF-23 IS A BIOMARKER FOR ALLOGRAFT DYSFUNCTION AFTER KIDNEY TRANSPLANTATION

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### AIM

Fibroblast growth factor (FGF) 23 is a recently discovered endocrine hormone with the primary action to stimulate phosphaturia. Through its “off-target” actions FGF-23 is linked to main adverse outcomes in chronic kidney disease (CKD) – progression to dialysis, cardiovascular (CV) disease and death. Experience with its use as a biomarker in kidney transplantation is limited. The primary goal of our study was to evaluate FGF-23 link to transplant recipients’ outcomes in the real-life clinical setting.

### MATERIALS AND METHODS

95 patients were included in this cross-sectional observational study. Data were obtained from medical records and charts. ELISA assay was used to measure FGF-23 levels.

### RESULT AND CONCLUSION

There were 52 male and 43 female patients, mean age 46,4 (range 21-71) years, transplanted for 65,64 (2-276) months with creatinine clearance (CCI) 70,9 (12,9-150) ml/min. FGF-23 levels showed pronounced relationship with allograft function and patients’ comorbidities. FGF-23 levels were significantly higher in patients with decreased allograft function who previously experienced episode of acute cellular rejection ( $p=0.011$ ). These patients expectedly had higher urea ( $p<0,001$ ) and creatinine ( $p<0,001$ ) values and lower CCI ( $p=0,021$ ). Elevated FGF-23 was associated with higher rate of CV events ( $p=0.023$ ). It was also linked to CV risk factors – older age ( $p=0,003$ ), hypertension ( $p=0,029$ ), dialysis vintage ( $p=0.006$ ) and Charlson comorbidity score ( $p<0,001$ ), it could be seen that patients in the higher FGF-23 group had significantly reduced allograft function ( $p<0,001$ ). These correlations also remained positive in multivariate analysis ( $r=0,679$ ,  $p<0,001$ ). When divided according to the immunosuppressive protocol (tacrolimus vs. cyclosporine vs. mTOR inhibitors) we found no differences between the studied variables. Results of our study demonstrate new evidence supporting an association between serum FGF-23 and allograft function. Further investigations with longer follow-up are needed to determine the significance of these findings.

## A SECONDARY CAUSE OF HUS PROGRESSIVE TO END STAGE RENAL FAILURE: COBALAMIN DEFECT

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### AIM

Hemolytic Uremic Syndrome (HUS) consists of the triad of acute renal failure, thrombocytopenia and microangiopathic hemolytic anemia. It can be typical or atypical. Atypical HUS is complement related. Cobalamin deficiency is among the causes of secondary HUS. HUS can lead to End Stage Renal Failure (ESRD).

### MATERIALS AND METHODS

An 8-year-old male patient presented to the emergency department with complaints of nausea, vomiting, diarrhea and fatigue. He had a history of Dandy Walker syndrome, epilepsy and growth retardation. His general condition was poor, he tended to sleep, his blood pressure was high and his breathing was superficial. He was evaluated as HUS and hypertensive encephalopathy due to acute renal failure, thrombocytopenia, anemia, reticulocytosis, elevated LDH, and schistocytosis. Since pulmonary edema continuous venovenous hemodialysis (CVVHD) was started. On the seventh day, he had a hypertensive attack, and intracranial hemorrhage was detected. CVVHD and plasma exchange (PLEX) were started, considering atypical HUS due to recurrent attack, low C3 and neurological involvement. AdamTS result was normal, STEC was negative and eculizumab was started and partial answer was obtained. He had a pulmonary hemorrhage and cardiac arrest one week apart. After detecting high serum homocysteine level hydroxycobalamin, betaine, carnitine, folbiol and coenzyme Q treatments were started considering the cobalamin C defect. No HUS attack was observed after this therapy. Eculizumab was stopped when no genetic mutation for HUS was detected. MMACHC gene was normal and the level of methyl malonic acid was not compatible with cobalamin C defect. Kidney transplant was performed from her mother shortly after.

### RESULT AND CONCLUSION

In conclusion, HUS is one of the preventable causes of ESRD in children. There are primary and secondary causes. Cobalamin defects should also be kept in mind, since it is a fast and easily accessible treatment when diagnosed early, and homocysteine level should be checked in every HUS case.

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## RARE ANATOMICAL ANOMALIES OF THE RIGHT INTERNAL JUGULAR VEIN AS A CAUSE OF IMPOSSIBILITY TO PLACE A HEMODIALYSIS CATHETER

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### INTRODUCTION

The most common cause of unsuccessful placement of a hemodialysis catheter in the jugular vein is acquired stenosis of the access vein due to previously placed catheters. Congenital anatomical anomalies, stenoses, or angulations of the blood vessels of the neck, which ultimately prevent catheter placement, are present less often.

### MATERIALS AND METHODS

We presented two patients in whom, after an unsuccessful attempt to place a catheter for hemodialysis, a vein malformation was subsequently established, which prevented the catheter introduction. In a patient who, after several unsuccessful attempts to cannulate the right internal jugular vein, had a temporary femoral catheter placed for hemodialysis in another institution, we found an extremely narrowed lumen of the said vein by ultrasound examination. The left internal jugular vein was found to have a normal anatomical position and diameter by ultrasound, and we placed a tunneled catheter in proper function. In the later course, MSCT venography confirmed hypoplasia of the right internal jugular vein. In the second patient, in whom we found a funnel-shaped narrowing of the lumen of the right internal jugular vein caudal to the clavicle during the previous ultrasound examination, during repeated insertion attempts, the guide became stuck at a depth of 10-12 cm. MSCT venography showed the right internal jugular vein, which in the terminal part narrows conically along the knee fold and gracile lumen to the subclavian vein. Permanent access is provided by placing a catheter through the right femoral vein.

### RESULTS AND CONCLUSION

Although congenital anatomical anomalies of the central veins are rare, in case of unsuccessful introduction of the guidewire, it is necessary to consider this possibility and perform venography in order to determine the vascular abnormality, avoid possible injuries to the central veins and choose the optimal alternative approach.

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## THE CORRELATION BETWEEN GASTROINTESTINAL SYMPTOMS, DIETARY FIBER INTAKE AND PROTEIN-FIBER RATIO IN PATIENTS ON PERITONEAL DIALYSIS AFTER INTERVENTION WITH MEDITERRANEAN DIET

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### AIM

Peritoneal dialysis (PD) is associated with alterations in the gut microbiota. Higher adherence to a Mediterranean diet (MD) may reshape the microbiota, have anti-inflammatory effect and lead to reduction of gastrointestinal symptoms. Our aim was to evaluate the effect of MD on the correlation between gastrointestinal symptoms, dietary fiber intake and protein-fiber ratio in patients on PD.

### METHODS

This study included 13 PD patients (32-70 years, 9 male) randomized into an intervention and controlled group. MD suitable for PD patients was defined in the study following the ESPEN guidelines. Intervention group followed MD plan with MEDAS score  $\geq 10$  points in the course of 6 weeks and met weekly with a dietitian. Both groups were evaluated pre- and post-intervention with Gastrointestinal Symptom Rating Scale, Bristol Stool Scale, MEDAS and biochemical parameters. Gathered nutritional information was analyzed with the Prodi 6.7 and the data was analyzed with SPSS and the Spearman's rank correlation test.

### RESULTS

The results of the Spearman's correlation test showed a statistically significant correlation between the total GSRS score and dietary fiber intake in diarrhea symptom cluster ( $r_s = -0.788$ ,  $p = 0.035$ ) and between the total GSRS score and the calculated protein/fiber ratio in abdominal pain symptom cluster ( $r_s = -0.797$ ,  $p = 0.032$ ) during the intervention in the intervention group. No correlation was observed between the total GSRS score in other symptom clusters and dietary fiber intake and between the total GSRS score in other symptom clusters and the protein/fiber ratio.

### CONCLUSION

Gastrointestinal symptoms are common in patients on peritoneal dialysis and can affect the quality of life of patients. MD can be beneficial for PD patients since it's associated with reduced inflammation and increased diet quality. Adherence to MD can also lead to reduced occurrence and severity of gastrointestinal symptoms such as diarrhea and abdominal pain.

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## HOMOCYSTEIN AND LIPID FRACTIONS ASSOCIATION IN PATIENTS ON HEMODIALYSIS

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### AIM

Elevated homocysteine levels induce oxidative stress and can be a sign of a coronary disease. Accompanied with elevated lipid fractions, especially LDL and VLDL may have a great impact on the development of atherosclerotic processes in blood vessels in long-term hemodialysis (HD) patients. Aim of the study was to examine association between increased concentration of total homocysteine and lipid fractions in patients on HD.

### MATERIALS AND METHODS

Our study is a cross-sectional study that included 83 subjects. 40 subjects were on HD at the Clinic for Hemodialysis, Clinical Center University of Sarajevo with dialysis vintage of more than six months. Second group were apparently healthy controls with 43 subjects. Lab data used in the study were: total homocysteine, cholesterol, HDL, LDL, VLDL, triglycerides. The data were processed in SPSS.

### RESULT

In our study HD patients had significantly higher homocysteine values compared to the control group ( $p < 0.05$ ). Groups didn't have significant age differences which shows homogeneity between groups ( $p = 0.746$ ). Spearman correlation didn't show significant relationship between homocysteine and lipid parameters in the group of subjects on HD: HDLc ( $p = 0.99$ ), cholesterol ( $p = 0.76$ ), LDLc ( $p = 0.92$ ), VLDLc ( $p = 0.78$ ) and triglycerides ( $p = 0.83$ ). The relationship between homocysteine and lipid parameters in the control group was also not significant: HDLc ( $p = 0.34$ ), cholesterol ( $p = 0.41$ ), LDLc ( $p = 0.32$ ), VLDLc ( $p = 0.63$ ) and triglycerides ( $p = 0.32$ ). There was no significant difference in triglyceride values between groups ( $p < 0.05$ ).

### CONCLUSION

HD patients in our study had significantly higher total homocysteine values compared to healthy controls. Total homocysteine did not show any association with parameters of lipid status in any group of subjects. Although the study was negative, these results correspond to other studies which show that elevated homocysteine levels can increase cholesterol and triglycerids but in the intracellular space, while being only slightly changed in extracellular space, nevertheless having an impact on atherosclerotic processes in blood vessels.

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## KOCURIA KRISTINAE – CASE REPORT OF RARE BLOOD INFECTION IN HEMODIALYSIS PATIENT

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### AIM

*Kocuria kristinae* was first described by Kloos et al. in 1974. Some case reports indicate the emergence of *K. kristinae* as a significant human pathogen, mostly in immunocompromised hosts, patients on continuous ambulatory peritoneal dialysis (CAPD), patients with central venous catheter.

### MATERIALS AND METHODS

Blood sample was taken for blood analysis and blood cultures. Specimens were cultured on chocolate agar plate and were processed by VITEK MS system.

### RESULT AND CONCLUSION

We describe the case of a 62-year-old woman with end stage renal disease (ESRD) on chronic hemodialysis who had bacteriemia with *Kocuria kristinae*. The patient started with HD in 2011th and has a lot of comorbidities. Vascular access- AVF on left forearm. On a regular HD term, the patient had fever, was febrile up to 39 C, general malaise, hypotension, tachycardia. The laboratory tests results showed: WBC 3.2; RBC 3.96; Hgb 123; PLT 202; C-reactive protein 122. We started empirical treatment with i.v antibiotic - amp. Ceftriaxone 2g after each dialysis session. Six days later, we received the results from blood culture-a bacteria *Kocuria kristinae* was isolated. The isolate was sensitive to the antibiotic we started, and we continued treatment within a period of 3 weeks. A week after a new blood culture was withdrawn and it showed negative. Laboratory test results showed drop in inflammatory markers (CRP levels - 16.8). No other tests were made because of the COVID pandemic. Only a few cases of *Kocuria Kristinae* infection were found in the literature and all of them are with percutaneous central venous catheters. Medical practitioners should be aware of the significance of this pathogen when it is isolated in clinical specimens. There is currently no guide on choices and duration of antimicrobial therapy. The increasing spread of this underestimated bacterium and its resistance to antibiotics represent a new challenge for public health.

## PAPILLARY THYROID CARCINOMA AS CAUSE OF SECONDARY MEMBRANOUS GLOMERULONEPHRITIS

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### AIM

Nephrotic syndrome classically presents severe proteinuria, hypoalbuminemia, hypercholesterolemia, edema, and hypertension. Membranous glomerulonephritis is responsible for 20% of nephrotic syndrome in adults. 20-30% of cases with membranous glomerulonephritis are due to solid malignancies, secondary causes such as infection, and rheumatological diseases. Autoantibodies against the podocyte antigen phospholipase A<sub>2</sub> receptor (PLA<sub>2</sub>R) have been detected in 70% of patients with idiopathic membranous glomerulonephritis.

### MATERIALS AND METHODS

A 67-year-old male patient with known diabetes, hypertension, coronary artery disease, and hypothyroidism applied to our clinic with the swelling in the legs. Positive findings were that pretibial edema was bilateral, right basal rales, hypoalbuminemia in the studies, hypercholesterolemia, +2 proteinuria in complete urinalysis, 12.3 g proteinuria in 24-hour urine. Kidney ultrasound of the patient with both kidneys is of average size, grade 1 increase in parenchymal echo. Kidney biopsy showed significant basement membrane thickening in all glomeruli, and the IgG capillary was granular++, consistent with membranous glomerulonephritis. In ultrasound, a lymph node (metastasis?) was found in the right cervical region, the largest 2x1 cm in size, with heterogeneous cortex with no hilum and some with microcalcification. In addition, thyroid and lymph node biopsies were planned. When the patient was diagnosed with nephrotic syndrome, tsh: 5.8 ft3:1.88 ft4:1.24, the thyroglobulin sent during the biopsy was:1980 calcitonin: 13.4. The patient's thyroid biopsy was compatible with papillary thyroid carcinoma.

### RESULT AND CONCLUSION

Membranous glomerulonephritis is the most common cause of nephrotic syndrome in adults. It is essential to investigate secondary causes and pregnancy and other diseases that may cause it. Among the malignancies of secondary membranous glomerulonephritis, and lung and colon cancers, substantial tumors are often among the causes. There are very few thyroid cancer-associated membranous nephropathy cases thatched in the literature. Our topic will contribute to new data on this relationship.

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## ACUTE KIDNEY INJURY DUE TO RHABDOMYOLYSIS ACCOMPANYING MULTISYSTEM INFLAMMATORY SYNDROME IN ADULTS AFTER SARS-CoV-2: A CASE REPORT

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### AIM

Multisystem inflammatory syndrome (MIS-A) is a severe complication of SARS-CoV-2 that can occur 2-12 weeks after onset of acute infection. MIS-A is most commonly characterized by fever, elevated inflammatory markers and extrapulmonary multiple organ system involvements (usually cardiovascular and gastrointestinal manifestations). We describe a case of MIS-A with the initial presentation of rhabdomyolysis and acute kidney injury (AKI).

### MATERIALS AND METHODS

A 53-year-old male with no previous illness came to the emergency department complaining of lower limb muscle pain, fatigue and difficulty breathing lasting for two days. Clinical examination showed lowered blood pressure (80/60 mmHg), SpO<sub>2</sub> of 77%, and tachycardia (202 beats/minute). The ECG detected a ventricular tachycardia that was successfully electroconverted. He was admitted to the ICU for further treatment.

### RESULT AND CONCLUSION

Initial laboratory results revealed rhabdomyolysis with AKI, acute liver injury, elevated troponin, proBNP, ferritin, D-dimer and IL-6 levels. Inflammatory markers were mildly elevated (CRP 67 mg/L, PCT 0.66 mcg/L, and no leukocytosis). Chest radiograph was normal except for an enlarged cardiac silhouette. Ultrasound of the abdomen showed no significant abnormalities. Microbiology testing was negative for legionellosis, leptospirosis, and Hantaan virus infection. Aggressive fluid resuscitation was started with the aim of restoring normal blood pressure and diuresis to treat rhabdomyolysis. MIS-A was suspected after it was established, he had positive PCR test for SARS-CoV-2 two weeks prior to hospitalization. Treatment with intravenous immunoglobulins combined with corticosteroids was prescribed, followed by rapid decrease of myoglobin, improvement of kidney and liver function and overall state of the patient. Multiorgan failure following recent SARS-CoV-2 infection without respiratory failure requires high suspicion of MIS-A and prompt identification of this devastating syndrome can be lifesaving. Although renal failure seldomly occurs in patients with MIS-A, it should not be automatically attributed to prerenal causes due to infection and further diagnostic evaluation needs to be performed.

## PECULIARITIES OF COVID 19 BRONCHOPNEUMONIA IN PATIENTS WITH CHRONIC RENAL FAILURE

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### AIM

Relevant clinical studies indicate a significantly poorer outcome in patients with advanced chronic renal failure (CRF) during Covid 19 probably due to significantly slower clearance of proinflammatory cytokines produced during infection but also in the presence of significantly higher cardiovascular comorbidity in these patients.

### MATERIALS AND METHODS

Analysis of medical records of patients with CRF who were treated for Covid 19 bronchopneumonia in the Temporary Covid 19 hospital "Stark Arena", Belgrade, during 2020/2021.

### RESULT AND CONCLUSION

We analyzed a records of 150 patients with a history of CRF:83 male (55.33%) and 67 female (44.67%), mean age  $73 \pm 10.12$  years (40-86 years), 91 of them (60.33%) suffered from high blood pressure, 46 (30.67%) from diabetes mellitus and 41 patients (27.33%) had both diseases. The mean value of sO<sub>2</sub> at admission was  $91 \pm 3.45\%$ , CRP  $89 \pm 109.7$  mg/l, IL-6  $61 \pm 39.4$  pg/ml, Hgb  $129 \pm 15.12$  g/l, urea  $13 \pm 7.64$  mmol/l, creatinine  $139.53 \pm 131.23$   $\mu$ mol/l, GFR  $46.48$  ml/min/1.73m<sup>2</sup>. Patients were treated according to the current protocol where 92 out of them also received an interleukin-6 receptor blocker (Tocilizumab 8-16 mg/kg). A total of 146 patients (97.33%) after successful treatment of bronchopneumonia were discharged for home treatment with average creatinine values of  $118 \pm 33.37$   $\mu$ mol/l and GFR  $55.24$  ml/min/1.73m<sup>2</sup>, while 4 patients (2.67%) due to the worsening of their general condition, were transferred to a higher - level health institution, from where they were further discharged without necessity for chronic dialysis treatment. There were no lethal outcomes. Advanced CRF is a significant risk factor for adverse clinical outcome during Covid 19. In our group majority of patients were with moderate CRF who had a successful end-therapeutic outcome, but a significant percentage of them required the use of Tocilizumab. The verified improvement of GFR at discharge is most likely a consequence of the remediation of factors (inflammation, dehydration, nephrotoxicity of drugs etc.) which led to worsening of preexistent CFR. Regardless of the existing degree, all patients with CFR require serious monitoring during Covid 19.

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## RARE DISEASES AND RENAL TRANSPLANTATION

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### AIM

According to the European registries, 24% of the pediatric and 38% of the adult patients had an unspecified or unknown primary kidney disease. At least some of these patients suffer from unrecognized rare disease. Knowledge of the primary cause of a disease is essential for adequate classification, prognosis, and most importantly, for the treatment, while it may determine the type of transplantation.

### MATERIALS AND METHODS

Case-series study that was done at the Clinic for Nephrology, Clinical Center of Montenegro, where we tried to demonstrate correlation between renal transplantation and influence of rare diseases on post-transplantation outcome.

### RESULT AND CONCLUSION

In the period of last ten years 13 patients with rare diseases were successfully treated with kidney transplantation. Six of these patients had Alport syndrome, 3 DRTA (distal renal tubular acidosis), one Jeune syndrome (ATD – asphyxiating thoracic dystrophy), one C1q nephropathy, one atypical HUS (hemolytic uremic syndrome), one Dent disease and one Di George syndrome. In the preparation for kidney transplantation, we also diagnosed 3 patients with tuberous sclerosis, one with primary hyperoxaluria and one with Mayer Rokitansky Kuster Hauser syndrome, but they did not undergo kidney transplantation due to primary disease complications which made them unsuitable for kidney transplantation. In the follow up period all of these patients still have functional grafts. They had various complications in post transplant period including: urinary tract infections, frequent respiratory tract infections and deterioration of respiratory function, chronic electrolyte imbalances, vascular calcifications and complications, native kidney and graft stones formations and complications, episodes of rejection, skin tumors. All of these patients needed specific clinical approach and management due to complex nature of primary disease. Screening for rare diseases in pre-transplantation period would improve overall outcome of transplantation in these patients. This study emphasizes the importance of early diagnosis and treatment of rare disease and their impact on transplantation outcome.

## SPONTANEOUS CHORDAE RUPTURE OF MITRAL VALVE IN KIDNEY TRANSPLANT RECIPIENT

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### AIM

Various complications consequent on disordered calcium and phosphate homeostasis occur frequently in CKD patients. Particularly, vascular calcification has high morbidity and mortality rates.

### MATERIALS AND METHODS

Case report.

### RESULT AND CONCLUSION

Male patient, 64 years old, diagnosed with myocarditis when he was 31, diagnosed with diabetes mellitus type 2 in 50, arterial hypertension since he was 51, presented with nephrotic syndrome when he was 56. Secondary causes were ruled out, and kidney biopsy was performed. Pathological finding showed IgA nephropathy. He developed CKD despite therapy in the next few years. First he was in chronic hemodialysis program for one year, before he was treated with kidney transplantation from deceased donor. He was on cyclosporine, MMF and steroid immunosuppressive regimen, with preserved heart function in preparation for transplantation. Six years after kidney transplantation he was presented with acute heart failure and de novo atrial fibrillation. Ultrasound of the heart indicated moderate mitral regurgitation, with rupture of the chorda for the anterior mitral cusp, left ventricular hypertrophy, enlarged both atria, moderate pulmonary hypertension. Acute coronary syndrome was ruled out, left ventricular ejection fraction was 35%. MRI of the heart indicated diffuse calcifications of the valvular apparatus and fibrous changes as results of previous myocarditis and long-standing secondary hyperparathyroidism. Although he was monitored and treated for secondary hyperparathyroidism for years in all stages of the disease, the consequences in terms of vascular calcifications and calcifications of the valvular apparatus were still manifested. Shortly thereafter, the patient developed chronic cardiorenal syndrome and terminal graft dysfunction and began a chronic hemodialysis program again. In a long-term perspective, the management of disorders of mineral-bone metabolism has the greatest impact on the survival and cardiovascular complications of patients in all stages of chronic renal failure and regardless of which form of RRT they were treated with.

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## ALTERATIONS AND QUANTIFICATION OF MICROVASCULATURE CHANGES IN CHRONIC KIDNEY DISEASE

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### AIM

Ocular microvascular changes can be related to kidney deterioration in chronic kidney disease (CKD). We aimed to identify the association between retino-choroidal parameters and kidney deterioration in hypertensive, diabetics, and non-diabetics CKD patients.

### MATERIALS AND METHODS

The cross-sectional study group consisted of CKD patients with different stages of CKD. Complete eye examination was completed with optical coherence tomography angiography (OCTA) scans of the macular region. We used the new OptoVue OCTA machine, to examine superficial and deep vascular density (SVD and DVD) on macular OCTA scans (3 × 3mm) centered on the fovea. According to the value of estimated glomerular filtration rate (eGFR) and albuminuria, patients were divided into groups: low GFR (60ml/min) and CKD patients without albuminuria and CKD with micro or macroalbuminuria.

### RESULT AND CONCLUSION

Two hundred eyes of 106 CKD patients were evaluated. The mean retinal thickness in GFR60 ml/min group was  $274,36 \pm 10,77 \mu$ . OCTA showed lower DVD in CKD with albuminuria versus CKD without albuminuria (p60 ml/min group ( $p=0.03$ ), but not in the CKD without albuminuria group versus the CKD with albuminuria ( $p=0.059$ ). DVD analysis revealed a lower density in the CKD without albuminuria group than in the CKD with albuminuria ( $p<0.001$ ). In bivariate analyses of correlation, kidney function, albuminuria, and glycemia were the strongest correlate of choroidal measures. The same analysis disclosed a significant association of choroidal, but not of retinal thickness measures, with GFR, as well as of SVD and DVD. Conclusions. CKD is associated with retinal diluting, and decreasing kidney function with a reduction of retinal and choroidal vascular density. These results confirm the close connection between changes in ocular microcirculation and kidney function.

## ASSOCIATION OF DIFFERENT FACTORS WITH HEMOGLOBIN LEVEL IN PATIENTS WITH HEMODIALYSIS

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### AIM

In our study, we evaluated the role of different causes of anemia and correlation of each of them with hemoglobin (Hb) level in hemodialysis (HD) patients. We evaluated the correlation of Hb level with vascular access, etiology, Urea Reduction Ratio (URR), time in HD, sex and age of patients too.

### MATERIALS AND METHODS

This cross-sectional study was carried out in 50 individuals admitted in HD unit of the University Hospital Center "Nene Tereza", Tirane and HD unit in Korca Regional Hospital. Serum samples were collected and urea, creatinine, Hb, erythrocytes, ferritin, PCR, albumin, leucocytes, and iPTH levels were measured. Exclusion criteria HD time for <6 months. Patients with acute kidney injury (AKI). Presence of malignancy. Evidence of blood loss or gastrointestinal bleeding. Hematologic chronic disease. Statistical analysis was carried out using the SPSS software (IBM, NY, USA).

### RESULTS

The average age were 55,72 years at an interval of 27-79 years. 42 % females and 58 % males. Months in HD: 6-180 monthes with an average of 63,76 monthes. URR with an average of 73 % from 52 %-93 %. Ferritinemia with an average of 455,6 ng/ml from 14,42-3344 ng/ml. PTH with an average of 591,2 ng/L from 1- 4298 ng/L. PCR with an average of 4,36 mg/L from 0,04- 119 mg/L. Albumina with an average of 3,69 mg/dl from 2,5 mg/dl- 4,2 mg/dl. A reverse correlation was found between HB level and intact PTH, PCR and ferritinemia. Hb level were higher in patients with AVF/AVG compared with patients with central catheter. Patients with Diabetic Nephropathy had the lowest level of Hb and patients with Autosomal Dominant Polycystic Kidney Disease had the highest level of Hemoglobin than patients with other etiology of Chronic Kidney Disease. URR, time in HD, age, sex of patients had no significant correlation on Hb level.

### CONCLUSIONS

An efficient control of parathyroid hormone hypersecretion and inflammation may be required to achieve a better management of anemia in HD patients.

## SARS-COV-2 IMMUNITY AMONG RENAL REPLACEMENT THERAPY PATIENTS: A PROSPECTIVE COHORT STUDY IN TIRANA, ALBANIA

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### AIM

Patients on Renal Replacement Therapy (Hemodialysis, Peritoneal Dialysis, Kidney transplant recipients) are at risk for severe COVID-19 because of compromised immune system. These patients are advised to get vaccinated according to health authorities' protocols. The aim of this study was to observe the antibody response after COVID-19 infection, vaccination and to determine the factors affecting their response.

### MATERIALS AND METHODS

An analytic, observational, prospective cohort study from January 2021-January 2022 was conducted in our service. 115 participants were enrolled in this study of which 64 on dialysis (27F/34M) and 51 kidney transplant recipients (19F/32M). All patients were vaccinated with 2 doses of Pfizer BioNTech vaccine and three serologic tests were taken.

### RESULTS

In patients who had already had Covid-19, the antibody response rate was 94.3% for dialysis patients and 87% for transplanted patients. Following two m-RNA vaccine doses, the seroconversion rate was 55% for patients on maintenance dialysis and 52% for kidney transplant patients. The factors that negatively influenced the dialysis patients' response included advanced patient age ( $p=0.000$ ), longest dialysis vintage ( $p=0.000$ ), very low BMI ( $p=0.005$ ), low albumin levels ( $p=0.000$ ), lymphopenia ( $p=0.001$ ), hyperparathyroidism ( $p=0.000$ ), high ferritin level ( $p=0.000$ ) and decreased Urea Reduction Rate ( $p=0.000$ ). For kidney transplant recipients; short transplant vintage ( $p=0.001$ ), lymphopenia ( $p=0.002$ ), high tacrolimus level ( $p=0.002$ ), and decreased GFR ( $p=0.004$ ) were factors that negatively influenced their seroconversion rate. Dialysis vaccine responders had a longer antibody persistence, with at least 8 months duration. Meanwhile, kidney transplant recipients had earlier antibody waning, with a 15% antibody persistence in the eight-month period.

### CONCLUSIONS

The factors influencing antibody response, efficacy, and duration, must be taken into account when vaccination protocols are implemented in patients on renal replacement therapy in order to optimize patient's status and achieve a satisfactory response rate. This study suggests considering a third vaccine dose or a booster for these patients.

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## INITIAL NEPHROLOGIST LED PERCUTANEOUS INSERTIONS OF PERITONEAL DIALYSIS CATHETER AT UMC LJUBLJANA - CASE SERIES

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### AIM

Various techniques are used to insert peritoneal dialysis (PD) catheters into the abdominal cavity. Percutaneous insertion represents a minimally invasive procedure with similar success rates and outcomes compared to open surgical and laparoscopic techniques.

### MATERIALS AND METHODS

We report 3 cases of percutaneous PD catheter insertion at UMC Ljubljana performed by a nephrologist. Case 1 was a 53-year-old man, BMI 18.9, stage 5 chronic kidney disease (CKD) not yet receiving renal replacement therapy. Case 2 was a 44-year-old male, BMI 25, CKD stage 5 not yet receiving renal replacement therapy. Case 3 was a 54-year-old male, BMI 20.8, currently receiving hemodialysis. Patient eligibility for the procedure was decided based on medical history, clinical examination, and ultrasonography of the abdominal cavity and wall. Catheters were inserted under general anesthesia in the operating room by blind placement using the modified Seldinger technique at median infra-umbilical position. Presence of an experienced abdominal surgeon ensured the surgical support needed in case of an adverse event. Two insertions required minimal modification of the Seldinger technique with dissection to the level of parietal peritoneum. Purse-string suture was placed around inner cuff in all cases to prevent leak. Immediate irrigation of the peritoneal cavity was performed to verify catheter function. The position of the catheter tip was determined from an abdominal radiograph before discharge from the hospital. One catheter tip was located in the deep pelvic region, and two were placed in the mid-abdomen and were displaced laterally. None of the catheters showed any signs of early malfunction or infection.

### RESULT AND CONCLUSION

Percutaneous placement of peritoneal dialysis catheters is a safe and feasible option in selected patients and can be performed by a motivated nephrologist who has adequate knowledge of basic surgical techniques. We suggest the presence of an abdominal surgeon during the initial procedures to secure additional patient safety.

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## **SKIN MANIFESTATIONS ARE COMMON AMONG PATIENTS WITH END-STAGE RENAL DISEASE. THE PRESENCE OF XEROSIS, HALF AND HALF NAILS, PRURITUS AND HYPER-PIGMENTATION**

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### **AIM**

Chronic kidney disease is currently an important public health issue. Some mechanisms for the progression of renal dysfunction include hyperlipidemia, hyperglycemia and hypertension. In this context, hypertensive and diabetic nephropathy are currently the main causes of end-stage renal disease (ESRD). In end-stage renal failure, with the progressive decline of glomerular filtration rate, the kidney fails to maintain normal levels of waste products of protein metabolism such as urea and creatinine.

### **MATERIALS AND METHODS**

The peer-reviewed literature and empiric findings are covered. The effects of ESRD are complex and can lead to dysfunction of multiple organs, including the skin. Early diagnosis and treatment in patients with renal disease enable a better quality of life, delaying the onset of skin manifestations.

### **RESULT AND CONCLUSION**

This review focuses on the skin manifestations of severe renal impairment or ESRD. Such manifestations of ESRD can be divided into nonspecific and specific. In the first group we can highlight changes in skin color, elastosis, ecchymoses, xerosis, pruritus, uremic frost, half and half nails and gynecomastia. The second group comprises perforating disorders, metastatic calcification, uremic fibrotic dermopathy and bullous diseases. Cutaneous and mucosal lesions in patients with ESRD can vary from each patient population to another. Factors such as diagnostic accuracy, climate, and early treatment influence some disorders such as pruritus, xerosis, and infections. Therefore, it is necessary that health professionals who deal with these patients on a daily basis have knowledge about these events. In this way, they will be able to establish early diagnosis and proper treatment and collaborate on research in order to elucidate their pathophysiology and seek new therapies for these diseases. Skin manifestations are common among patients with ESRD. The presence of xerosis, half and half nails, pruritus and hyper-pigmentation in a patient with renal derangement should heighten the suspicion of possible ESRD among other causes.

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## CENTRAL VEIN CATHETER FOR HEMODIALYSIS – EXPERIENCES FROM GENERAL HOSPITAL KOPRIVNICA

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### AIM

The aim of this paper is the overview of a five-year process in GH Koprivnica, and to show most common complications in the first year after inserting a central vein catheter.

### MATERIALS AND METHODS

Following the recommendations about the indication for placement of permanent CVC, recommendations for choosing the right place to insert catheter and ensuring sterile environment and the rules for doing the procedure, we started with inserting permanent CVC in 2016. The choice of the permanent dialysis catheter was the split-stream catheter of various lengths, depending on the anatomic location of the vein the catheter is inserted into. The insertion is done with the ultrasound control, and the final position of the catheter is determined by diascopy. Despite the recommended order of preferred places for the insertion of the catheter, due to a more difficult hygiene regiment and a slightly higher infection rate, we consider femoral veins as the least adequate vascular access for hemodialysis. The necessity to change the inserted permanent CVC included complications such as bacteriemia, infection of the catheter tunnel, catheter dysfunction and central vein stenosis. Perioperative complications included local bleeding, pneumo-/hemothorax, catheter clamping, catheter thrombosis, infection of catheter exit point, who were dealt with in the early perioperative period, have not been dealt with in this paper.

### RESULT AND CONCLUSION

In the five-year period in GH Koprivnica, 153 split-stream catheters have been inserted. The frequency of complications that required the change of catheter in the period between the first month and a year after the insertion of the catheter is not higher than the percentage of complications stated in the relevant medical literature. The improvement of the procedure technique, the place of insertion and the choice of the type of catheter, the adequate anticoagulation and care/handling the catheter are crucial for the reduction of complications with catheters.

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## PARENTERAL NUTRITION IN CHRONIC HEMODIALYSIS PATIENTS - OUR EXPERIENCES-

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Parenteral nutrition is about delivering nutrients directly into the circulatory system via infusion. This way, water, energy substrates (glucose and lipids), and other nutritional ingredients are replenished.

We distinguish between partial parenteral nutrition, which meets part of the daily nutritional needs, supplementing oral nutrition, and complete parenteral nutrition intended for patients with a non-functional digestive system, which meets the entire daily nutritional needs. The nutritional status of patients treated with intermittent hemodialysis can be improved by improving the quality (bicarbonate high-flow and high-efficiency hemodialysis using biocompatible dialysis materials and ultrapure dialysate) and the dose ( $Kt/V > 1.4$ ) of dialysis, which, in addition to nutritional status, can have a beneficial effect on reducing inflammation (the adverse impact of which is manifested by reduced albumin synthesis and increased catabolism of proteins).

Patients with poor nutritional status can be treated with intradialytic parenteral nutrition during hemodialysis. With the help of intradialytic parenteral nutrition, a significant reduction in protein catabolism and an improvement in the nutritional status of dialysis patients can be achieved. The volume of nutritional replacement (usually 1 liter of fluid) must be included in the ultrafiltration, and it is important to warn the patient to watch out for intradialytic weight gain. The rate of nutritional replacement must not exceed 250 ml/h, which means adjusting the duration of hemodialysis.

The parenteral preparation (we used OLICLINOMEL N7 1000ml) is connected via the infusion pump directly to the venous dropper of the bloodlines and given to the patient during the dialysis procedure. The general condition as well as the values of laboratory findings after the completion of treatment with intradialytic parenteral nutrition showed a significant recovery in all three patients.

Key words: parenteral nutrition, hemodialysis

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## APPLICATION OF THE ALTEPLASE IN PERMANENT HEMODIALYSIS WITH CV CATHETERS - OUR EXPERIENCES

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The vascular approach for hemodialysis patients is elementary in performing the intervention. A permanent (tunneled) central venous catheter is a common type of vascular approach in chronic hemodialysis patients' program. Patients are mostly the elderly population in whom the creation and needling of an arterial-venous fistula is difficult or almost impossible, so the permanent catheter is a method of choice. One of the main tasks for nurses at hemodialysis department is care and maintenance of permeability for all hemodialysis central venous catheters.

When we are working with catheters, the primary task is to ensure the aseptic environment during the hemodialysis process and maintenance of catheter permeability. Proper catheter conservation at the end of each hemodialysis treatment has an important role. Anti-coagulant preservative applied to the catheter lumen may be heparin, citrate or the Alteplase. It is possible that over time blood-clot and fibrin accumulation occur within or around the catheter itself. This situation is specific for each patient individually. The Alteplase is primarily used as a thrombolysis agent for strokes and heart attacks, but also it helps to maintain central venous catheter permeability in hemodialysis patients. Thrombosis can equally affect a blood vessel and a dialysis catheter.

The question is when to apply the Alteplase into the catheter? Each facility which implements hemodialysis has an individual rule of applying the Alteplase in order to prevent complications of central venous catheter permeability. Some apply the Alteplase after second or third "insufficient" hemodialysis in which adequate blood flow could not be achieved, or in which there was a frequent interrupt of access. At our hemodialysis department the Alteplase is applied every week to all patients who have permanent hemodialysis catheters. Our opinion is that a regular application of the Alteplase greatly contributes to a significant reduction of interventions due to the poor blood flow in hemodialysis process.

Key words: hemodialysis, the Alteplase

## UČESTALOST KONTINUIRANOG NADOMJESNOG LIJEČENJA BUBREŽNE FUNKCIJE U JEDINICAMA INTENZIVNE SKRBI - Naša iskustva u KBC Sestre milosrdnice

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Metode kontinuiranog nadomjesnog liječenja bubrežne funkcije u jedinicama intenzivne skrbi su: polagana kontinuirana ultrafiltracija (SCUF), kontinuirana arteriovenska hemodijaliza (CAVHD), kontinuirana venovenska hemodijaliza (CVVHD), kontinuirana venovenska hemodijafiltracija (CVVHDF) koja je sistemske (heparin) i lokalne (citratna) antikoagulacije. CVVHDF spojen na ECMO sustav, ili CVVHDF kod kojeg koristimo otopine bez laktata.

Učestalost smo pratili brojem tretmana i brojem bolesnika, te brojem radilišta na kojem su tretmani rađeni kroz 2020., 2021. i 6 mjeseci 2022. godine. Podatke smo prikupljali iz standardne evidencije hemodijaliznih tretmana na odjelu hemodijalize. Praćenjem podataka primjetan je ukupan porast od 109% broja tretmana i 94% broja bolesnika na CVVHDF s lokalnom i sistemskom antikoagulacijom u 2021 kao i u prvih 6 mjeseci 2022. Radilište SJIL i JIL ima ukupan porast od tretmana od 100% od čega je znatno povećanje tretmana s lokalnom antikoagulacijom o odnosu na 2020.godinu. U Covid intenzivnoj 2020. provedeno je 10 tretmana kod samo 1 bolesnika, dok je u 2021. napravljeno 213 tretmana kod 16 bolesnika. Koronarna jedinica ima ukupan porast tretmana sa 221 kod 26 bolesnika u 2020. na 255 tretmana kod 27 bolesnika u 2021. U neurološkoj intenzivnoj sa 12 tretmana kod 2 bolesnika u 2020. raste broj na 44 tretmana kod 6 bolesnika u 2021.

Taj statistički značajan porast kontinuiranih metoda nadomještanja bubrežne funkcije možemo pripisati pandemiji Covid-19, kao i činjenici da je odjel hemodijalize u tom razdoblju bio u renovaciji i nije bilo mogućnosti izvođenja akutnih intermitentnih hemodijaliza zbog tehničkih uvjeta i osoblja koje je bilo na privremeno dislocirano u KBC Zagreb.

Ključne riječi: kontinuirano nadomještanje bubrežne funkcije, jedinice intenzivnog liječenja

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## ULOGA MEDICINSKE SESTRE KOD PRIMJENE BORTEZOMIDA I PLAZMAFEREZE KOD MULTIPLOG MIJELOMA I AKUTNE BUBREŽNE INSUFICIJENCIJE – PRIKAZ SLUČAJA

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Multipli mijelom (MM) je progresivna zloćudna hematološka bolest. Karakteriziran je infiltracijom koštane srži malignim plazma stanicama koje luče monoklonalne imunoglobuline u serumu ili urinu.

Plazma je tekući dio krvi, sadrži imunoglobuline i ostale proteine (u slučaju MM paraproteine).

Plazmafereza je vrlo djelotvoran način uklanjanja paraproteina i smanjenje viskoziteta krvi pri oboljenju od MM. Mora se ponavljati barem dva do tri puta tjedno dok kemoterapija ne počne djelovati. Plazmafereza može pomoći bolesnicima s oštećenjem bubrega uzrokovanim velikim količinama lakih lanaca.

Akutna bubrežna insuficijencija nerijetko se javlja kao posljedica multiplog mijeloma.

U radu je prikazan 54 godišnji pacijent (koji je 09. /2021. prebolio COVID 19) kod kojeg je nakon hospitalizacije na odjelu nefrologije uz hipererkalcemiju, anemiju, renalnu insuficijenciju utvrđen i patološki omjer lakih lanaca u serumu. Hematološkom obradom dijagnosticiran je multipli mijelom lakih lanaca lambda tipa. Zbog visokih vrijednosti serumskih lakih lanaca indicirana je plazmafereza. Postupak plazmafereze učinjen je na odjelu za dijalizu u pet navrata uz nadoknadu 5% albumina i svježe smrznute plazme.

Postupci plazmaferenze su bili zahtjevni za izvođenje zbog velikih volumena izmjene plazme i neadekvatnog krvožilnog pristupa (zbog neprohodog kraka CVK-a koristila se periferna vena i jedan krak CVK-a). Medicinska sestra je cijelo vrijeme uz pacijenta i prepoznaje pravovremeno komplikacije vezane uz pacijenta (alergijske reakcije) i uz aparat za plazmaferezu. Znanje i vještine medicinske sestre koja radi plazmaferezu i primjenjuje bortezomid ključni su za uspješno provođenje terapije. Liječnici određuju parametre terapije i doze lijekova ali medicinska sestra je ta čija će praktična znanja neposredno doprinjeti oporavku pacijenta.

Od specifične hematološke terapije pacijent je dobivao: bortezomid, deksametazon i ciklofosamid.

Terapijskom izmjenom plazme i primjenom bortezamida smanjio se broj lakih lanaca u serumu a bubrežna funkcija je u poboljšanju. Pacijent se dobrog općeg stanja otpušta kući te se liječenje nastavlja kroz dnevnu bolnicu.

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## PRIKAZ SLUČAJA: PLAZMAFEREZA KOD POVRATA FSGS U TRANSPLANTIRANI BUBREG

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Indikacije za PF nakon transplantacije bubrega su: povrat osnovne bolesti (PF) i odbacivanje grafta posredovanog protutijelima (PF ili IA).

Prikaz slučaja: B.D., 1996.god., Dg.: FSGS, HA. Sa 6.god. dokazana FSGS, u 12. god. učinjena bilateralna nefrektomija- CAPD, 2014. transplantacija bubrega, 2018. pogoršanje funkcije grafta (biopsija), rituximab i pf, 2022. pogoršanje funkcije grafta. Transplantacija bubrega je najbolja metoda nadomještanja bubrežne funkcije. 2018.god. povrat osnovne bolesti, u vidu proteinurije i pogoršanja funkcije grafta. Biopsijom se utvrdi povrat osnovne bolesti FSGS, te je započeto liječenje rituximabom i postupcima PF.

Plazmafereza je metoda kojom se izvantjelesnom cirkulacijom plazma pročišćava kroz filter (odstranjuju antitijela). PF se po načinu odstranjivanja plazme iz krvi dijeli na: membransku i centrifugalnu, a po nadoknadi odstranjene plazme na: pf sa 5% HA, pf sa SSP, ili kombinacijom 5% HA i SSP. PF imaju i neke čimbenike rizika kao što su: virusne infekcije, alergijske reakcije, poremećaj faktora zgrušavanja i imunoglobulina. Potrebna kontrola imunoelektroforeze te eventualna nadoknada IG. Učinjena četiri postupka PF, i prati se pad vrijednosti kreatinina i proteina u urinu. Nakon toga bolesnica dolazi na PF jedan put tjedno ambulantno.

## ULOGA MEDICINSKE SESTRE KOD BOLESNIKA S POSEBNIM POTREBAMA I KRONIČNIM ZATAJENJEM - PRIKAZ SLUČAJA

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Kronična bubrežna bolest je stanje u kojem bubrezi gube sposobnost uklanjanja otpadnih produkata metabolizma i suvišnih tekućina iz organizma. Biokemijskom pretragom krvi može se vidjeti narušena bubrežna funkcija.

Bolesnik I.M.1997.dolazi u pratnji majke jer je osoba s posebnim potrebama. Nakon normalnog poroda prati se hipotonija, te se odlučio na obradu kariotipizacije. Kao rezultat nađena je duplikacija kromosoma, koja rezultira autizmom i epilepsijom. S 25 godina govori 20-tak riječi, ispušta neartikulirane zvukove, intelekt. zaostao, autističan. U 6mj. 2021.prvi put dolazi u naš Zavod zbog komplikacija liječenja kroničnog zatajenja bubrega. Učinjena biopsija bubrega u općoj anesteziji jer je nemoguće učiniti biopsiju u lokalnoj anesteziji, pacijent izrazito nemiran, viče, baca se po krevetu. Prilikom bilo kakvog pristupa pacijentu, kontakt je za nas medicinske sestre izrazito težak i iscrpljujuć. Nalaz biopsije ukazuje na FSGS NOS tip gdje se odlučio na postupke LDL afereze (ukupno 6). Uveden peroralni ciklosporin, što se komplicira razvojem pneumonije i trombozom na mjestu CVK. Postavljen trajni Tessio kateter radi provođenja nadomjesne terapije scuf 2 puta tj. Odlukom liječnika i u dogovoru s majkom pristupa se postavljanju CAPD katetera, uz cijelo vrijeme provođenje hemodijaliza na privremeni cvk. Otpušta se kući dobrog općeg stanja, u svoj dijalizni centar do edukacije za provođenje CAPD-a. U boravku kod nas se također obavio psihološki razgovor s majkom u svezi obrade bolesnika za TX bubrega u budućnosti. Usljed čestih komplikacija kroz postupke dijagnostike, afereze, dijalize i svih ostalih radnji pacijent izrazito psihički uznemiren, uplašen. Izravna pomoć nam je majka, ona podiže i traži ispunjenje visokih standarda kvalitete zdravstvene njege za svoje dijete. Multidisciplinarnim pristupom i timskim radom smo uvijek uspjeli od našeg pacijenta dobiti osmijeh a ponekad i udarac.

Kako bi osoba s posebnim potrebama bila sretna i zadovoljna potrebno je bilo uložiti iznimno puno truda, znanja, vještina i strpljenja kako bi postigli cilj.

## VIŠESTRUKO REZISTENTNI MIKROORGANIZMI - VLADARI BOLNICA

GAJSKI ŽELJKA

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Mikroorganizmi su nastali prije 3 milijarde godina i najjednostavniji su oblik života. Njihova prilagodljivost na okolinu omogućila im je preživljavanje i stalno mijenjanje zbog selektivnog pritiska u kojem vodi nekritična upotreba antibiotika. Kao što je Charles Darwin rekao: „Vrsta koja preživljava nije najsnažnija od svih vrsta, niti najinteligentnija, nego ona koja najbolje odgovara na promjenu, jasno je vidljivo da su to upravo mikroorganizmi.

Cilj je ovog rada prikazati sve višestruko rezistentne uzročnike izolirane u razdoblju od 01.01-31.12.2021g., u OB Varaždin, te ih usporediti s izolatima iz 2019 i 2020 godine.

Istraživanje je provedeno tijekom kolovoza 2022 godine, retrospektivno, analizom medicinske dokumentacije i dostupnim izvješćima o višestruko otpornim uzročnicima iz mikrobiološkog laboratorija Zavoda za javno zdravstvo Varaždinske županije.

Udio višestruko otpornih izolata u odnosu na ukupan broj izolata od 1.1.- 31.12.2021.g. (jedan po bolesniku).

Podaci o rezistenciji bakterija na antibiotike jasno ukazuju na veličinu problema i obvezuju nas da učinimo maksimalne napore u provođenju mjera prevencije razvoja rezistencije i sprječavanju širenja rezistentnih mikroorganizama. Obzirom da je rezistencija na antimikrobne lijekove prisutna u svim dijelovima svijeta, trenutno je jedan od najvećih izazova globalnog javnog zdravstva. Procjenjuje se da bi nerješavanje tog problema moglo rezultirati oko 10 milijuna smrti do 2050 godine. Stoga je veliki naglasak u radu stavljen na mjere hospitalne higijene i racionalnu upotrebu antibiotika.

Ključne riječi: Višestruko rezistentni mikroorganizmi, rezistencija, bolničke infekcije, prevencija, izolacija

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## MINIMALNO INVAZIVNE METODE KOD LIJEČENJA UROLITIJAZE U BOLESNIKA S TRANSPLANTIRANIM BUBREGOM – PRIKAZ SLUČAJA

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Urolitijaza je značajan klinički problem koji se odnosi na otprilike 20 % svih uroloških bolesti. Predispoziciju za nastajanje kamenaca mokraćnog sustava čine klimatski, genetski, anatomske, endokrini, upalni i drugi čimbenici. Velika većina bolesnika izmokra kamence, a u ostalih se liječenje sastoji od aktivnoga praćenja, vantjelesnog mrvljenja kamenca, perkutane nefrolitotripsije, ureteroskopije te laparoskopske i otvorene kirurgije. Izbor metode ovisi o kamencu (položaj, veličina i vrsta), tipu transplantacije (ortotopna, urinarna diverzija ili dr.) i dostupnoj opremi. U prevenciji nastajanja kamenaca savjetuje se dijetalna prehrana i značajan unos tekućine što za posljedicu ima obilnu diurezu. U našem centru, retrospektivnim istraživanjem, saznajemo da se urolitijaza kao urološka komplikacija javila u 0,7% (9 od 1209) transplantiranih bolesnika. U ovome radu prikazana su tri pacijenta s transplantiranim bubregom u kojih je dijagnosticirana urolitijaza. Sva tri pacijenta su liječena minimalno invazivnim postupcima. Jedan pacijent u kojega je učinjena en bloc transplantacija liječen je vantjelesnim mrvljenjem kamenca. Drugi pacijent kojemu je transplantacija učinjena nakon urinarne diverzije (augmentacija mokraćnog mjehura) liječen je mini perkutanom nefrolitotripsijom. U trećeg pacijenta, kod kojega je kamenac vjerojatno postajao u donorskom bubregu, morali smo primijeniti više endoskopijskih transuretralnih i perkutanih pristupa u liječenju urolitijaze. Sva tri pacijenta i danas imaju funkcionalne presatke i dobre nalaze. Cilj ovoga rada je ukazati da su minimalno invazivne metode prvi izbor u liječenju urolitijaze svih pacijenata, osobito pacijenata s transplantiranim bubregom s ciljem minimalnog oštećenja bubrežnog tkiva.

## PRIKAZ SLUČAJA: PRETRANSPLANTACIJSKA OBRADA BOLESNIKA LIJEČENOG HEMODIJALIZOM I AFEREZOM LIPIDA

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J. S., m., 1952. Dg: HA, DM 2, HD chr, CVI, Amputacio digiti, Hiperkolesterolemija- LDL afereza, COVID 19 infectio.

Broj bolesnika s kroničnom bubrežnom bolesti (KBB) iz godine u godinu sve više raste pri čemu značajnu ulogu igraju dva čimbenika - prvi je starenje populacije, a drugi je visoka učestalost šećerne bolesti kao vodećeg uzroka bubrežnog oštećenja na globalnoj razini. Međutim, važno je naglasiti da glavni uzrok smrtnosti u kroničnih bubrežnih bolesnika nije progresija bolesti prema završnom stadiju već su to srčanožilne bolesti.

Šećerna bolest nastaje kao posljedica smanjenog izlučivanja inzulina uz veću ili manju perifernu rezistenciju na inzulin s posljedičnom hiperglikemijom. Komplikacije šećerne bolesti posljedica perioda slabije regulacije glikemija te se mogu podijeliti u akutne i kronične.

Akutne komplikacije nastaju veoma brzo, i ako se adekvatno ne liječe mogu biti opasne po život. U akutne komplikacije spadaju hipoglikemija i hiperglikemija.

Kronične komplikacije javljaju se nakon dužeg vremenskog perioda neregulirane šećerne bolesti. Dugotrajna hiperglikemija štetno djeluje na krvne žile te dolazi do difuznog progresivnog sužavanja malih krvnih žila (mikroangiopatija) i velikih krvnih žila (makroangiopatija). Mikroangiopatske promjene najčešće zahvaćaju oko, bubrege, probavni i živčani sustav, a makroangiopatske srce, mozak, krvne žile nogu.

Koliko je dobra glukoregulacija ključna u oboljelih od šećerne bolesti govori i činjenica da osobe sa šećernom bolešću 2-4 puta češće obolijevaju od infarkta miokarda i 4-10 puta češće od moždanog udara - gotovo 80% oboljelih umire od posljedica srčanožilnih komplikacija.

Imajući na umu probleme s kojima se suočavaju bolesnici sa šećernom bolesti, ne treba čuditi da se evaluacija bolesnika za listu čekanja dominantno usmjerava na pravovremeno otkrivanje srčanožilnih komplikacija.

Transplantacija bubrega jest zlatni standard u liječenju završnog stadija kronične bubrežne bolesti, koja doprinosi boljoj kvaliteti života i ishodu liječenju. Problemi transplantacije su vezani uz prateće komorbiditete kronične bubrežne bolesti.

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## CONTINUOUS RENAL FUNCTION REPLACEMENT TREATMENT IN INTENSIVE CARE UNIT - FROM ASPECT OF NURSE

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Patients with acute renal failure, severe systemic infection, intoxication, extensive surgery or polytrauma very often require continuous replacement of renal function.

Nurses and medical technicians of the Department of Nephrology and Dialysis carry out the procedure of continuous renal replacement therapy (CRRT), which in practice means that they prepare the dialysis machine, set the dialysis parameters according to the nephrologist's prescription and start the treatment.

After the start of the procedure, general monitoring of the patient and alarms on the dialysis machine are taken over by nurses and medical technicians of the Intensive Care Unit (ICU), while monitoring of hemodialysis procedures and servicing of the dialysis machine are carried out by nurses and medical technicians of the Department of Nephrology and Dialysis.

A multidisciplinary approach is extremely important among medical professionals who participate in the care of patients on CRRT. During 2020, 68 CRRT treatments were performed for 11 patients in the ICU of the Medicine Clinic of the "Sestre milosrdnice" Clinical Hospital Center, and in 2021, an even greater number of CRRT treatments (214) were performed for 39 patients. In the first 6 months of 2022, 104 CRRT treatments were performed for 20 patients. There is an evident increase in the number of CRRT procedures at the ICU.

In conclusion, a multidisciplinary approach and cooperation of medical professionals who care for patients who need CRRT is necessary.

The COVID-19 pandemic led to a shortage of staff, while the earthquake that struck Zagreb and construction work led to the redistribution of staff to multiple sites.

We successfully compensated for the lack of staff in both departments with a professional approach to the care of seriously ill patients, regardless of the very difficult challenges that were occurring.

Key words: continuous renal replacement therapy, intensive care unit, multidisciplinary approach

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## UTICAJ PANDEMIJE SARS-CoV-2 VIRUSOM NA BOLESNIKE NA PERITONEUMSKOJ DIJALIZI I HEMODIJALIZI

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### CILJ

Bolesnici na hemodijalizi i peritoneumskoj dijalizi imaju brojne komorbiditete i slabost imunskog sistema, zbog čega su posebno osjetljivi na SARS-CoV-2 infekciju. Dokazano je da je kod bolesnika na hemodijalizi veća prevalencija, teži klinički tok i lošiji ishod COVID-19 infekcije. Bolesnici na peritoneumskoj kućnoj dijalizi su manje izloženi SARS-CoV-2 virusu u odnosu na bolesnike na bolničkoj hemodijalizidijalizi.

### MATERIJALI I METODE

U periodu od 2 godine (mart 2020. godine početak pandemije SARS COV 2 virusom - mart 2022. godine) praćeno je 89 pacijenata na hemodijalizi i 23 pacijenata na peritoneumskoj dijalizi.

### REZULTAT I ZAKLJUČAK

Na početku pandemije (mart 2020. godine) naš dijalizni centar je brojao 89 hemodijaliznih bolesnika i 23 bolesnika na peritoneumskoj dijalizi. U januaru 2022. godine taj broj je značajno manji. 2022.godinu smo započeli sa 68 hemodijaliznih bolesnika, a na peritoneumskoj dijalizi imamo 21nog bolesnika. Broj preminulih bolesnika 2020.godine na HD bio je 20, a na PD 3, 2021.godine broj preminulih HD bolesnika bio je 19, a PD 3. se manja smrtnost kod pacijenata na peritoneumskoj dijalizi. Kod bolesnika koji se leče nekom od metoda zamene bubrežne funkcije, kućna peritoneumska dijaliza predstavlja dobar izbor u periodu pandemije.

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## CROATIAN EXPERIENCE IN IMMUNOADSORPTION – NURSE ROLE

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### AIM

Immunoadsorptions (IA) is an extracorporeal technique used for removal of antibodies and molecules from the blood. IA is a blood – purification technique that enables the selective removal of immunoglobulins (Ig) from separated plasma, leaving other plasma components and avoid the need for plasma replacement, through high – affinity adsorbers. IA is currently used for treatment of a large variety of antibody – mediated immunological disorders and in different clinical areas (humoral – mediated rejection of transplanted organs, Nephrology, Pulmonology, Cardiology, Haematology, Neurology, Rheumatology, Dermatology). Treatment is very useful in renal transplantation, which can be used in the pre and early post - transplantation period. Imunoadsorption is the method of choice for different indications, but it's wide use is limited by the cost of treatment.

### MATERIALS AND METHODS

First immunoadsorption in Republic of Croatia was conducted in October 2020 in our Department, and since then we are the only center that provides this procedure in Croatia. Till July 2022 we have treated fifteen patients and conducted 185 IA treatments. For this procedure we used two machines simultaneously, one for plasmfiltration and second one for plasma purification. IA was successful in cross – checking true rate of donor – specific antibodies (DSA) and graft glomerul function. The complications were rare and were related to problems with vascular access.

### RESULT AND CONCLUSION

Although our experience is based upon small number of patients, we can conclude that IA is safe and effective treatment when conducted by a specially educated medical staff. The role of nurses in implementing the treatment is not sufficiently emphasized. Even when we have the best medical equipment and doctors who will prescribe IA, procedure could not be carried out without specially trained nurses who know how to cope with the challenges of conducting immunoadsorption procedure.

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## IZAZOVI I POTEŠKOĆE U LIJEČENJU BOLESNIKA S KBB

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### CILJ

Jedna od najčešćih bolesti današnjice je kronična bubrežna bolest bubrega. U ovim slučaju pratimo bolest i liječenje pacijentice sa policistozom bubrega. Nasljedni poremećaj kod kojeg se stvaraju ciste u oba bubrega. Nasljeđuje se recesivnim ili dominantnim načinom nasljeđivanja. Simptomi koji se javljaju su bol, nelagoda u križima, krv u mokraći, infekcija uslijed bubrežnih kamenaca, zamor, mučnina. Dijagnoza se postavlja UZV-om i CT-om, te se prepozna karakterističan izgled bubrega.

### MATERIJALI I METODE

Naša pacijentica odlučuje se za hemodijalizu koja se provodi putem AVF, sve do transplantacije 2012. Nakon nekog vremena dolazi do porasta serumskog kreatinina u sumnje na akutno odbacivanje. Nakon više hospitalizacija ponovno započinje HD putem Tesio katetera, te se ubrzo učini graftektomija. Druga TX 2021. uz brojne komorbiditete, te imunoadsorpciju uz česte kontrole i hospitalizacije u našem centru.

### REZULTAT I ZAKLJUČAK

Započinjanjem liječenja bubrežnih pacijenata često dolazi do osjećaja straha i depresije. Moraju započeti liječenje jednom od metoda koja je nova i nepoznata za njih. Zabrinuti su za svoje zdravlje i budućnost. Obrada za transplantaciju i sama transplantacija nekad se čekaju i duže vremena. Pacijenta je potrebno upozoriti na važnost redovitih kontrola za vrijeme liječenja, čekanja TX i nakon TX. Motivirati ih na postavljanje pitanja, te isto tako davati detaljne informacije o njihovu stanju. Kod skrbi naših pacijenata potreban je multidisciplinarni pristup, jer liječenje je specifično i zahtjevno. Medicinska sestra ima važnu ulogu u njihovim životima. Dobrom komunikacijom, pokazivanjem empatije, te intervencijama prema smanjenju razine anksioznosti i prihvaćanju bolesti uspostaviti ćemo dobar odnos sa pacijentom. Uključivanjem, informiranjem obitelji i bližnjih pacijent će dobiti dodatnu sigurnost i motivaciju za liječenjem. Time će održati cjelokupno zadovoljstvo i kvalitetu života koja mu je potrebna.

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## INDIVIDUALIZIRANA DIJALIZA

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Tradicionalno, pacijenti koji razviju progresivnu kroničnu bubrežnu bolest trebaju nadomjesnu terapiju bubrega sa preskripcijom tri puta tjedno hemodijaliza na početku terapije. Ovaj empirijski recept temelji se na povijesnim ispitivanja koja su se sastojala od većinom prevalentnih pacijenata. Inkrementalna hemodijaliza je proces izvođenja manje od 3 sesije dijalize tjedno ili ograničavanje dijalizne doze po trajanju na početku liječenja kako bi se osigurao postupniji prijelaz, oponašajući progresivnu prirodu bolesti bubrega. Dodavanje doprinosa klirensu iz rezidualne funkcije bubrega standard je skrbi za peritonealnu dijalizu, ali se nije rutinski koristio s hemodijalizom. Izračun rezidualne funkcije bubrega, poboljšanja u adjuvantnoj farmakoterapiji, kao što su noviji agensi za vezanje kalija i modifikacije prehrane, mogu povećati dijalitičke razmake i omogućiti postupni pristup liječenju. Primjena inkrementalne dijalize povezana je s očuvanjem rezidualnog funkciju bubrega kao i poboljšanje kvalitete života bolesnika. Prepreke ovom pristupu uključuju zabrinutost glede prihvatanja od strane pacijenata, promjene preskripcije za dijalizu, pridržavanje terapije. Inkrementalna terapiju pokazala je najbolje rezultate kada je klirens uree veći od 3 ml/min i volumen urina je >500 mL/dan, iako se te mjere smatraju konzervativnima. Značajni podatci iz retrospektive te podaci iz registra podržavaju iniciranje inkrementalne hemodijalize, a nekoliko pilot studija pokazalo je izvedivost takvog pristupa. Potrebna su veća, randomizirana kontrolna ispitivanja kako bi se u potpunosti procijenila sigurnost i učinkovitost kako bi se omogućilo široko prihvaćanje ovog pristupa kroničnoj bubrežnoj bolesti usmjerenog na bolesnika.

Ključne riječi: hemodijaliza, inkrementalna dijaliza

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## BODY COMPOSITION MONITOR -PRIMJENA U PRAKSI

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Kontrola tekućine važan je dio skrbi za pacijente na hemodijalizi. Sve je više dokaza da korištenje mjerenja bioimpedancije s monitorom sastava tijela (BCM; Fresenius Medical Care, Njemačka) može pomoći u menadžmentu volumnog statusa i poboljšanju ishoda. Međutim, postoji nekoliko pragmatičnih studija koje mogu pomoći u informiranju o korištenju BCM-a izvan strogog protokola koji se preporučuje za mjerenja što može isključiti značajan broj pacijenata kada se BCM koristi kao dio rutinske skrbi. Pri Zavodu za nefrologiju, dijalizu i transplantaciju bubrega, KBC Rijeka obavezno koristimo mjerenja dva puta godišnje (ožujak, rujak) u svih pacijenata, a prema indikaciji i češće. Populacija na hemodijalizi je opterećena brojnim pridruženim bolestima i nesrazmjerno je sklona amputacijama i problemima održivosti tkiva. Oštećena koža i amputacije mogu onemogućiti korištenje standardnog mjerenja, dok neke komplikacije možda neće spriječiti mjerenje, ali će značajno utjecati na kvalitetu mjerenja – npr. korištenje hidratantnih sredstava, lokalizirano nakupljanje tekućine ili kontakt između dijelova tijela poput pazuha ili između nogu. Validirani alternativni putovi omogućili bi izvođenje mjerenja na pacijentima koji bi inače bili liječeni bez BCM-a ili bi se liječili na temelju podataka loše kvalitete. Također postoje brojne situacije u kojima bi bilo korisno izvršiti mjerenja BCM-a nakon dijalize. Praktičnost i brojnost osoblja ponekad mogu otežati provođenje svih potrebnih mjerenja BCM-a u isto vrijeme kada se pacijenti priključuju na dijalizu, dok mjerenja nakon dijalize također omogućuju poduzimanje hitnih radnji kada intradijalitički simptomi potaknu pregled suhih težina.

Ključne riječi: hemodijaliza, bioimpedancija, body composition monitor

## KRONIČNA BUBREŽNA BOLEST – HEPATITIS B, C I HIV

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Bolesnici u završnom stadiju bubrežne bolesti imaju slab imunološki odgovor, a i veća je prevalencija virusa koji se prenose krvlju poput virusa hepatitisa B i C s posljedičnim rizikom od izbijanja. Veća prevalencija i priroda hemodijalize, povećavaju rizik kroz čimbenike rizika kroz horizontalni i vertikalni prijenos. Stope serokonverzije cijepljenja su niže, a titri protutijela i trajanje imuniteta također su smanjeni u ovoj populaciji. Savjetuje se da se cijepljenje obavi rano u procesu bolesti s dvostrukom dozom cjepiva. Najčešće u dijalizi diljem svijeta susreću se hepatitis B, hepatitis C i rjeđe HIV. Ovi pacijenti imaju veći rizik od opće populacije za hepatitis B i C zbog njihovog slabog imunološkog odgovora i izloženost transfuzijama krvi i hemodijaliznoj opremi. HIV je rjeđi u okruženju na dijalizi, ali su pacijenti u opasnosti zbog izloženosti krvi tijekom postupka na dijalizi. Trenutno ne postoje cjepiva za HIV. Osoblje mora osigurati da svi pacijenti na dijalizi imaju osnovni probir na HCV, HBV i HIV.

Zdravstveni djelatnici u jedinicama za dijalizu moraju osigurati da pacijent pristane na testiranje kao dio lokalnih smjernica za postupke i mora osigurati da svi pacijenti koji pristanu na hemodijalizu prime hepatitis B cijepljenje osim ako su HBsAg ili anti-HBc pozitivni. Slučajevi sa kliničkom sumnjom na akutni virusni hepatitis moraju se prijaviti od strane liječnika Jedinici za javno zdravstvo. Supružnici i njegovatelji pozitivnih pacijenata moraju imati dostupne informacije te kontrolirati vlastitu izloženost i cijepljenje protiv hepatitisa B.

Ključne riječi: bubrežna bolest, hepatitis, cijepljenje

## PLAZMAFEREZA - PRIKAZ SLUČAJA DERMATOMIOZITISA I SIFILISA

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Plazmafereza je terapijska tehnika afereze koja se koristi u liječenju različitih bubrežnih i sistemskih bolesti s različitim stupnjevima dokazane kliničke učinkovitosti koja uklanja visokomolekularne tvari iz krvne plazme (autoantitijela, imuni kompleksi, laki lanci mijeloma, endotoksini, krioglobulini, lipoproteini) konvektivnim transportom kroz polupropusnu membranu. Indicirana u širokom rasponu specijalnosti, a s obzirom na sporadičnu prirodu bolesti koje mogu imati koristi od postupka, iskustvo u ovoj tehnici često se oslanja na objavljene serije slučajeva ili nekontrolirane studije, što otežava prikupljanje kvalitetnih dokaza o preživljenju i bubrežnoj funkciji. Stoga je ukupno individualno iskustvo, iako općenito ograničeno, važno u ovoj terapiji. U ovom radu prikazati ćemo dva slučaja, različitih indikacija sa dobrim kliničkim ishodom.

Slučaj 1. 55-godišnja pacijentica hospitalizirana je zbog sumnje na dermatomiozitis. Po prijemu se manifestirala prisutnim kožnim promjenama (eritematozne papule nad MCP, eritem s unutarnje strane koljena, obostrano skvamozne promjene na ekstenzornoj strani lakta, ulceracije sluznice nosne šupljine, periorbitalni edem s eritemom) uz mišićnu slabost. S obzirom na pristigao anti MDA5 pozitivitet, odlučujemo se započeti s plazmaferozom. Postupak se provede ukupno u 4 navrata što pacijentica dobro podnosi, uz dobar klinički odgovor.

Slučaj 2. 40-godišnji pacijent s kasnom manifestacijom kasnog sifilisa s afekcijom očiju i centralnog živčanog sustava. Indicirano je učiniti 5 plazmafereza koje pacijent dobro podnosi.

Ključne riječi: plazmafereza, dermatomiozitis, sifilis

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## NESURADLJIVOST PACIJENTA – PRIKAZ SLUČAJA

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Pravovremeno upućivanje pacijenta s kroničnom bubrežnom bolesti daje dovoljno vremena za adekvatnu pripremu za nadomjesnu terapiju u obliku dijalize ili transplantacije. Edukacija pacijenata prije dijalize i zdravstvena pismenost rezultiraju nizom ključnih prednosti za pacijente, uključujući: odgađanje početka dijalize, smanjenje pobola i smrtnosti, poboljšanje upravljanja anemijom, pothranjenošću, mineralno-koštanim poremećajima i utječe na čimbenike razvoja kardiovaskularne bolesti. Priprema za početak dijalize uz očuvanu preostalu bubrežnu funkciju i pravovremena priprema pristupa za izabrani oblik dijalize značajno utječe na kvalitetu života. U ovom radu prikazati ćemo nesuradljivost pacijenta vezanu uz propisanu terapiju i odgađanje nadomjesnog liječenja. Riječ je o muškarcu u dobi od 45 godina kojem je ranije, nakon pregleda u hitnoj nefrološkoj ambulanti, preporučana hospitalizacija koju je on odbio. Navodi kako je za glomerulonefritis saznao u dobi od 7 godina. Unatrag 25 godina ima povišen k tlak radi čega uzima kroničnu terapiju. Povremeno je kontrolirao lab nalaze u privatnim ustanovama (nalaze ne prilaže). Nije se kontrolirao kod nefrologa dugi niz godina. Drugog dana hospitalizacije postavljen je netunelirani dijalizni centralni venski kateter putem desne unutarnje jugularne vene te je započeto liječenje hemodijalizom.

Ključne riječi: hemodijaliza, suradljivost

## KLINIČKI ISHODI INFEKCIJE COVID 19 U BOLESNIKA LIJEČENIH DIJAZNIM METODAMA, MULTICENTRIČNA STUDIJA DIJALIZNIH CENTARA PODRUČJA SJEVERNOG JADRANA RH (COV19-HD-SJ)

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Bolesnici s kroničnom bubrežnom bolešću (KBB) smatraju se populacijom s povećanim rizikom od težeg oblika bolesti infekcije Covid 19 i s povećanim rizikom od smrtnog ishoda. Osobito je povećan rizik u bolesnika na dijalizi i u bolesnika s presađenim bubregom ili gušteračom i bubregom, kao i u predzavršnom stadiju kronične bubrežne bolesti, te bolesnici s autoimunom bolesti bubrega sa imunosupresivnom terapijom.

Svi dijalizni centri prema dostupnim informacijama od samog početka pandemije ulažu izuzetne napore u provođenju mjera trijaže, ranog detektiranja te pravovremenog izoliranja suspektnih ili pozitivnih pojedinaca u cilju sprečavanja horizontalnog prijenosa infekcije. Izvještaji o ishodima u dijaliznih bolesnika bili su sa malim brojem bolesnika što potvrđuje učinkovitost navedenih mjera, te uglavnom iz velikih zemalja sa velikim brojem ovakvih bolesnika.

U KBC Rijeka na Zavodu za nefrologiju, dijalizu i transplantaciju bubrega u radoblju od rujna 2020. do kraja ožujka 2022. 98 bolesnika u kroničnom tretmanu hemodijalize imalo je detektiranu Covid 19 infekciju. U 14 bolesnika nastupio je smrtni ishod uslijed komplikacija tijekom bolesti, ostali bolesnici su razvili potpuni oporavak. Očekivano bi obzirom na uremiju i pridružene komorbiditete stopa smrtnosti u ovih bolesnika trebala biti znatno viša, no mali broj bolesnika razvio je tešku kliničku sliku. Visok udio bolesnika detektiran je u asimptomatskom stanju, najčešće prilikom rutinskih traženja kontakata.

Kako bi prikupili što veći broj informacija o ovoj grupi bolesnika u procjeni kliničkog stanja i daljnjim ishodima liječenja u ovu studiju uključili smo dijalizne centre Primorsko-goranske i Istarske županije. Procjena kliničkog stanja, ishodi i komplikacije bili su procijenjeni prema trenutno vrijedećim smjernicama za praćenje i liječenje oboljelih od koronavirusne bolesti odobrenim od strane Ministarstvo zdravstva Republike Hrvatske.

## PRIKAZ SLUČAJA BOLESNIKA SA ARTERIJSKOM HIPEERTENZIJOM I DISEKCIJOM AORTE

VIDRIH SUZANA

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### UVOD

Visoki krvni tlak ili arterijska hipertenzija je stanje povišenog tlaka krvi u arterijama te može biti znak, čimbenik rizika ili bolest. Najčešće je čimbenik rizika za kardiovaskularne bolesti, cerebrovaskularne događaje, zatajivanje srca i razvoj kronične bubrežne bolesti. Disekcija aorte (disecirajuća aneurizma, disecirajući hematoma) je vrlo ozbiljno stanje, često smrtno, u kojem dolazi do rascijepa unutarnje ovojnice aortne stjenke (endotel aorte), dok vanjska ovojnica ostaje netaknuta. Najčešći uzrok takvog oštećenja je visoki krvni tlak ili arterijska hipertenzija, a ustanovljen je u više od dvije trećine bolesnika u kojih se dogodi aortna disekcija. U cjelokupnom zbrinjavanju pacijenata kroz proces zdravstvene njege medicinska sestra/tehničar provode sistematizirane intervencije koje su usmjerene prema održavanju i optimaliziranju zdravstvenog stanja, sprječavanju nastanka komplikacija postojećih bolesti sa ciljem postizanja zadovoljavajućih funkcionalnih rezultata.

### PRIKAZ SLUČAJA

U radu prikazujem bolesnika u dobi od 38 godina koji je primljen na odjel Nefrologije kao hitan slučaj zbog hipertenzivne krize. Bolesniku je od ranije poznata arterijska hipertenzija, ali je samoinicijativno prestao uzimati terapiju. Tijekom hospitalizacije dolazi do pojave simptoma koji upućuju na akutno vaskularno zbivanje, učini se hitna dijagnostička obrada (UZ srca i CT angiografija) kojom se verificira disekcija uzlaznog dijela aorte, luka aorte i početnog dijela descendentne aorte. Bolesnik se hitno premješta u kardiokiruršku jedinicu intenzivnog liječenja radi operativnog zahvata i daljnjeg liječenja.

### ZAKLJUČAK

Disekcija aorte (disecirajuća aneurizma, disecirajući hematoma) je vrlo ozbiljna komplikacija arterijske hipertenzije, često smrtna te oko 75% bolesnika s disekcijom aorte umire u prva dva tjedna ukoliko se ne liječe. Djelokrug rada medicinske sestre/tehničara kroz pravovremeni i holistički pristup temeljen na znanju uvelike pomaže u liječenju i sprječavanju ozbiljnih komplikacija bolesti.

Ključne riječi: hipertenzija, disekcija aorte, medicinska sestra/tehničar

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## NESURADLJIVOST I KOMPLIKACIJE VASKULARNOG PRISTUPA

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VOJNOVIĆ EDITA, Buterin Sanja, Devčić Bosiljka

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Nepridržavanje terapije (restrikcije u prehrani/tekućini, lijekovi i liječenje dijalizom) uobičajeno je u pacijenata sa završnom fazom bubrežne bolesti koji su na dijalizi. Povezano je s većim rizikom od smrtnosti i štetnih ishoda. Klinička ispitivanja koja procjenjuju intervencije za poboljšanje adherencije uvelike su se bavila čimbenicima povezanim s pacijentima primjenom obrazovnih/kognitivnih, savjetodavnih/bihevioralnih, psiholoških strategija ili njihovih kombinacija. Glavna prepreka napretku suradljivosti vezanim uz dijalizu je poteškoća zbog vrlo raznolike prirode intervencija i ishoda suradljivosti.

U ovom radu prikazati ćemo pacijenta u dobi od 58 godina koji je nakon odbacivanja bubrežnog presadka nastavio liječenje hemodijalizom. U pacijenta uz veliku nesuradljivost bilježimo i cijeli niz intervencija na pristupu krvotoku. U obradi je za retransplantaciju u drugom transplantacijskom centru.

Ključne riječi: hemodijaliza, suradljivost, arteriovenska fistula

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## PRIKAZ SLUČAJA KOD BOLESNIKA SA KOMPLIKACIJAMA U SVEZI TRANSPLANTACIJE

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### UVOD

Transplantacija organa je danas prihvaćena i katkad jedina terapijska opcija za liječenje akutnog ili kroničnog zatajenja organa. Transplantacija organa je kompleksna i tehnički je jedan od najkompliciranijih postupaka liječenja te može biti praćena brojnim komplikacijama.

U komplikacije nakon transplantacija ubrajaju se kirurške komplikacije, odbacivanje, usporena funkcija transplantiranog organa, infekcije i neželjene posljedice imunosupresiva.

Citomegalovirusna infekcija je široko rasprostranjen ljudski virus koji inficira veliki dio ljudske populacije a nakon primarne infekcije zauvijek ostaje u organizmu domaćina. Kod osoba sa oslabljenim imunim sustavom može uzrokovati po život opasne infekcije. Pneumonija je infekcija pluća koja zahvaća male zračne mjehuriće (alveole) i okolno tkivo. Proces zdravstvene njege je 24-satna psihička, fizička i mentalna skrb za dobrobit i blagostanje bolesnika.

### PRIKAZ SLUČAJA

Bolesnik je 55-godišnjak koji dolazi zbog otežanog disanja i dugotrajnog kašlja. Prijašnje bolesti kod bolesnika su terminalna bubrežna bolest, kronični glomerulonefritis, poremećaj koštano-mineralnog metabolizma, esencijalna hipertenzija, stanje nakon presadbe bubrega, stanje nakon transplantacije. Tegobe koje je bolesnik osjećao su kašalj, neučinkovito disanje, osjećaj umora pri blagom naporu te umor.

### ZAKLJUČAK

Tijekom hospitalizacije stanje bolesnika se pogoršalo te se s odjela nefrologije premješta na odjel pulmologije gdje se stanje bolesnika nije stabiliziralo te je premješten u jedinicu intenzivnog liječenja gdje se opće stanje bolesnika stabiliziralo. Zaključna dijagnoza bolesnika je akutna respiratorna insuficijencija te se kod takvog bolesnika mora napomenuti da djelokrug rada medicinske sestre/tehničara kroz pravovremeni i holistički pristup temeljen na znanju uvelike pomaže u liječenju i sprječavanju ozbiljnih komplikacija bolesti.

Ključni riječi; transplantacija, citomegalovirus, pneumonija, medicinska sestra/tehničar

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## HEMODIALYSIS AND PROTEIN-ENERGY NUTRIENT INTAKE

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### AIM

The purpose was to analyze the nutritional intake of patients on hemodialysis treatment, to determine whether it meets their needs. We performed the analysis on 30 randomly selected hemodialysis patients, out of 190 treated at the University Clinical Center of Ljubljana. In the method of work we used; interview (dietary analysis). We used the Prodi 6.6 Expert program for the analysis of dietary intake, as well as the measurement of body composition with the BCM-body composition monitor. device. For more accurate results, it was necessary to conduct multiple nutritional interviews using the menu method.

### CONTENT

We analyzed 15 women and 15 men receiving hemodialysis treatment. 3x weekly. The patients agreed to participate in the research. We conducted the dietary interview five times over a period of three months. For the nutritional interview, we used the previous day's menu method and pictorial material showing portion sizes. The results of the nutritional interview were analyzed using the online tool Prodi 6.6 Expert. Body composition was measured using the BCM-body composition monitor. which was performed before being connected to dialysis.

During a bioimpedance measurement, a high-frequency electrical current can pass through most biological membranes. Therefore, when a high-frequency electric current is passed, it passes through the intracellular and extracellular fluid. Low-frequency electric current cannot pass through cell membranes, so the current passes exclusively through the extracellular fluid.

### CONCLUSION

With the methods used, we often detect too low dietary protein intake as well as energy intake. We have also observed that some patients are unaware that their protein requirements are greatly increased because of receiving dialysis treatment, unlike in the pre-dialysis period of KLB when they were on a low protein diet. Some patients cited a lack of appetite as well as poor socioeconomic status for low energy intake.



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