



Abstracts

1st National Artificial Organs and Support Systems Congress

June 15–17, 2007, Istanbul, Turkey

	Page
Oral Presentations	
Kidney	A111–A114
Heart	A114–A116
Kidney/Pancreas/Skin/Blood	A116–A121
Heart/Vessels	A122–A126
Poster Presentations	A126–A130

Oral Presentations

Oral Presentations—Kidney

1

Relationship of Early Assessment of Renal Resistance Index With Long-Term Renal Function in Renal Transplant Recipients

Arzu Akgül¹, Avsin Ibis¹, Siren Sezer¹,
Alper Usluogulları², Ceyla Başaran²,
F. Nurhan Ozdemir¹, Mehmet Haberal³
Baskent University Faculty of Medicine,
Department of Nephrology¹, Internal Medicine²,
General Surgery³, Ankara, Turkey

Introduction: Intrarenal arterial resistance index (RI) is a useful, noninvasive diagnostic tool for the follow-up of transplanted kidney. It has proven to predict short-term allograft function reliably in early period after renal transplant. However, the effect of renal RI on long-term renal functions is not well known. This lacking data led us to examine the predictive value of intrarenal RI on long-term allograft outcome. **Methods:** Between 1999 and 2001, we re-

spectively investigated 121 (23 females, 98 males) stable renal transplant patients, aged 30.69 ± 9.15 years, followed for a period of mean 63.21 ± 19.9 months after renal transplant. Patients with complications during the first 6 months after transplantation were not included. Color Doppler ultrasonography had been performed for calculation of intrarenal RI within the first 4 weeks after transplantation. The following parameters such as demographic features, medications, serum creatinine, lipid parameters, daily proteinuria, systolic blood pressure, diastolic blood pressure, pulse pressure, mean arterial pressure, number of human leukocyte antigen (HLA) mismatches, number of episodes of acute rejection and delayed allograft function were evaluated. **Results:** According to univariate analyses, renal RI (RR = 1.062, $p = 0.015$) and donor age (RR = 1.057, $p = 0.002$) were associated with allograft outcome variable. Multivariate analyses revealed that renal RI and donor age were found as independent predictive values on allograft outcome. We examined the effect of renal RI, by using cut-off value as 0.7, on transplant outcomes and development of chronic allograft nephropathy (CAN) using Kaplan-Meier analysis. Kaplan-Meier estimates of cumulative graft survival were significantly worse in patients who had $RI \geq 0.7$ than in patients who had $RI < 0.7$ (52.14% versus 82.14%, $p = 0.005$) and development of CAN was significantly higher in patients who had $RI \geq 0.7$ (65.71% versus 82.14%, $p = 0.02$). **Conclusions:** Our study shows that renal RI determined within the first month after renal transplantation predicts long-term allograft function and graft failure in renal transplant recipients.

2

Highlights on Hepatic Necroinflammation, Fibrosis and Clinical Data in a Cohort of Hepatitis C Virus-infected Hemodialysis Patients

Rengin Elsurer¹, Baris Afsar¹, Banu Bilezikci², Siren Sezer¹, Zubeyde Arat¹, F. Nurhan Ozdemir¹ and Mehmet Haberal³

¹Department of Nephrology, Baskent University Hospital, Ankara, Turkey; ²Department of Pathology, Baskent University Hospital, Ankara, Turkey; and ³Department of General Surgery, Baskent University Hospital, Ankara, Turkey

Introduction and Aims: Liver is involved in lipid metabolism and is an erythropoietin- and thrombopoietin-producing organ. High-density lipoprotein cholesterol (HDL-C) accelerates hepatitis-C virus (HCV) endocytosis into target cells and neutralizes activity of anti-HCV antibodies. We investigated influence of HDL-C levels on development of hepatic necroinflammation and fibrosis in HCV-infected hemodialysis (HD) patients, and once developed impact of necroinflammation and fibrosis on clinical parameters. **Methods:** 80 anti-HCV positive HD patients (M/F: 49/31, mean age: 48.9 ± 11.9 years, dialysis vintage: 140.2 ± 67.0 months) were included. Patients were followed up for 97.4 ± 46.6 months after establishment of HCV infection. Patients with splenomegaly, overt malnutrition, iron, folic acid or vitamin B12 deficiency, collagen diseases, myeloproliferative disorders or heparin induced thrombocytopenia and patients receiving interferon alfa were excluded. Liver biopsy and Child-Pugh classification was performed in 33 patients with chronic hepatitis C. **Results:** Histopathology revealed lobular necroinflammatory activity in 26, portal necroinflammatory activity in 14 and fibrosis in 19 patients. 22 patients were Child-A, 11 patients were Child-B. Patients with and without liver fibrosis had similar HCV infection durations, viral loads and alanine aminotransferase, aspartate aminotransferase, total cholesterol, low-density lipoprotein cholesterol and triglyceride levels. Patients with HCV infection progressing to hepatic fibrosis had higher HDL-C levels than those not progressing to fibrosis (40.5 ± 12.7 mg/dL vs 31.5 ± 11.8 mg/dL, $P: 0.04$). Number of patients with HDL-C ≥ 35 mg/dL was significantly higher among patients with liver fibrosis than patients without fibrosis ($P: 0.03$). Having a HDL-C level of ≥ 35 mg/dL increased the risk of liver fibrosis 5.0 folds (CI: 1.129–22.496). Lobular and portal necroinflammatory activities were not associated with HDL-C. Patients with liver fibrosis had lower hemoglobin ($P: 0.002$) values and thrombocyte counts ($P:$

0.03) than those without fibrosis. In multiple logistic regression analysis (variables including age, dialysis vintage, duration of HCV infection, presences of portal and lobular necroinflammatory activities and fibrosis), hepatic fibrosis was the only factor independently associated with thrombocytopenia ($P: 0.04$, OR: 7.651, CI: 1.031–56.786). Patients with hepatic fibrosis required higher Epo doses ($P: 0.014$) than those without fibrosis. Degree of anemia and Epo need did not differ among patients with and without lobular or portal necroinflammatory activity. **Conclusions:** In conclusion, our preliminary results warrant reconsideration of target HDL-C levels in anti-HCV positive HD patients due to its effects on hepatic fibrosis. Once developed, hepatic fibrosis enhances Epo requirement and is independently associated with thrombocytopenia, even in Child A and Child B cirrhotic HD patients.

3

Body Fat Percentage as an Indicator of Inflammation and Atherosclerosis in Chronic Hemodialysis Patients

Siren Sezer, Burak Sayin, Gulsah Sasak, Zubeyde Arat, F. Nurhan Ozdemir, Mehmet Haberal

Baskent University Faculty of Medicine, Nephrology Department, Ankara, Turkey

Introduction and Aims: Atherosclerosis and malnutrition are two major causes of morbidity and mortality for chronic hemodialysis (CHD) patients. Bioimpedance analysis (BIA) is a noninvasive method to estimate body fat mass, an indirect indicator for nutritional status. Despite a high body fat percentage (BFP) associated with increased cardiovascular disease and all causes of mortality among the general population, a high BFP may be paradoxically associated with improved survival for chronic hemodialysis patients. We aimed to establish body fat composition profile of the CHD patients in our center by using bioimpedance analysis (BIA), body mass index (BMI) and waist-hip ratio to find out their association with inflammation and atherosclerosis. **Methods:** 110 CHD patients (55 male and 55 female, age: 49.8 ± 12.1 years) undergoing hemodialysis treatment for 1 to 20 years were included. Diabetic patients, usage of steroidal and non-steroidal anti-inflammatory drugs during the study, hospitalization within 90 days, ongoing enteral or parenteral nutrition therapy and any proven infection or inflammatory disease were exclusion criteria. Malnutrition inflammation scoring has been used and supported with biochemical parameters; C-reactive protein, serum iron, total

iron binding capacity, ferritin, CBC, serum albumin, total cholesterol, LDL, HDL and triglyceride. The BMI and BFP ratio of our patients were compared to the results in healthy populations. The patients were divided into 3 gender based groups according to their body fat percentages defined by BIA. Group 1 (n:27) was composed by the patients in the lowest tertile of low body fat percentage, group 2 (n:56) in the middle tertile of body fat percentage whereas group 3 (n:27) patients were in the upper tertile of body fat percentage. We compared three groups for presence of atherosclerosis and inflammation based on clinical, laboratory data and MIS. **Results:** Mean BMI was $23.4 \pm 4.2 \text{ kg/m}^2$ for the whole group; 22.9 ± 3.6 for male and 23.9 ± 4.7 for female patients. BFP for the whole group were $35.1 \pm 12.9\%$ (4% – 60.2%), $30.6 \pm 11.2\%$ in males, $39.6 \pm 13.0\%$ in females. When patients were grouped according to BMI (underweight, normal, overweight-obesity), underweight patients had significantly high MIS scores ($p = 0.01$, $p = 0.01$), and significantly low TG levels compared with normal and overweight patients ($p:0.01$, $p = 0.004$, respectively). All underweight patients (BMI < 20%) were in group 1. Age ($r:0.207$, $p = 0.03$), leukocyte ($r:0.281$, $p = 0.003$), lymphocyte ($r:0.287$, $p = 0.003$), CRP ($r:0.231$, $p = 0.01$), total cholesterol ($r:0.225$, $p = 0.02$), triglyceride ($r:0.241$, $p = 0.01$) results were significantly correlated with BFP in the study group. When gender was considered, older age ($r:0.368$, $p = 0.02$), BMI ($r:0.737$, $p = 0.00$), waist-hip ratio ($r:0.519$, $p = 0.00$), total leukocyte count ($r:0.379$, $p = 0.004$), and total iron binding capacity ($r:0.296$, $p = 0.02$) were found significantly correlated with BFP in female and BMI ($r:0.630$, $p = 0.00$), serum creatinine levels ($r:-0.369$, $p = 0.04$) and MIS ($r:-0.512$, $p = 0.001$) in male patients. Considering the BFP groups, group 3 patients who exhibited >48% of body fat had significantly higher total leukocyte count and lymphocyte count ($p = 0.03$, $p = 0.03$), C-reactive protein ($p = 0.03$) total iron binding capacity ($p = 0.01$) and triglyceride ($p = 0.04$) levels and lower serum iron levels ($p = 0.01$) than those in middle and lowest tertiles. Atherosclerosis rates were 12.5% for group 1 and 19.1% for group 2 and 58.8% for the group 3, respectively ($p = 0.03$). Evaluating the groups with malnutrition inflammation scoring showed; both group 1 and group 3 patients had significantly high inflammation scores compared with group 2 ($p = 0.00$, $p = 0.04$, respectively). **Conclusion:** Our results indicate that BFP can be surrogate source of inflammation in dialysis population. The lowest tertile and highest tertile of BFP are significantly associated with inflammatory parameters and presence of atherosclerosis. In normal and overweight subjects

up to 48% percentage; BFP acts a protective against inflammation but over this ratio its adverse influence emerges.

4

Effects of Bicarbonate- and Lactate-Buffered Replacement Fluids on Metabolic and Hemodynamic Outcomes in Continuous Renal Replacement Therapies

U. Yakupoglu¹, S. Temur², M. Sayin², V. Şenkal¹, B. Aykaç²

¹Medicine-Division of Nephrology, ²Anesthesiology and Reanimation, Yeditepe University, Istanbul, Turkey

Introduction: Continuous renal replacement therapies (CRRT) are well accepted for critically ill patients with acute renal failure (ARF) and lactate-buffered peritoneal solutions have been used as dialysate for CRRT. However, considering that lactate has negative impact on metabolic and hemodynamic effects in this group of patients, use of bicarbonate solutions may be thought to have advantage. This study was designed to investigate the effects of bicarbonate- and lactate-buffered replacement fluids on the clinical outcomes of ARF patients treated with CRRT. **Methods:** During a 12 month period, 221 sessions of CRRT (mean of 20 ± 11.5 hours) were performed for 39 ARF patients between the age of 19 and 84 years. All patients were in multiple organ failure, 24 required mechanical ventilation, 23 were receiving vasopressors. The patients were randomized to either with bicarbonate-buffered replacement fluid (group I, n = 24) or lactate-buffered replacement fluid (group II, n = 15). Clinical and laboratory findings were compared with each other in both groups. **Results:** Blood lactate levels were significantly lower and blood bicarbonate levels were significantly higher in patients treated with group I than in those treated with group II (lactate, 17.1 ± 8.3 vs. $27.7 \pm 10.2 \text{ mg/dL}$, $p < 0.05$; bicarbonate, 22.4 ± 1.7 vs. $20.9 \pm 1.7 \text{ mmol/L}$, $p = 0.003$, respectively). Two out of 11 patients in group I and 5 out of 7 patients in group II developed cardiovascular complications including hypotension, arrhythmia and angina during CRRT therapy ($p = 0.02$). **Conclusion:** The results show that the administration of bicarbonate-buffered replacement fluid was superior in normalizing acidosis in this group of patients. The data also suggest that the use of bicarbonate-buffered replacement fluid during CRRT reduces cardiovascular events in critically ill patients with acute renal failure, particularly those with hemodynamic instability.

5

The Influence of Bicarbonate/Lactate Peritoneal Dialysis Solution on Nutritional Status

Ayşe Bilgiç¹, Avsin İbis¹, Siren Sezer¹,
Bulent Huddam², Zubeyde Arat¹,
F. Nurhan Ozdemir¹

Baskent University Faculty of Medicine,
Department of ¹Nephrology, and ²Internal
Medicine, Ankara, Turkey

Physiological bicarbonate/lactate-based solution represents an effective, safe, well tolerated, and physiologically balanced alternative to conventional lactate-buffered peritoneal dialysis (PD) solutions. In this study, 25 mmol/L bicarbonate/10 mmol/L lactate PD solution (Physioneal, Baxter Healthcare) was compared with a standard 35 mmol/L lactate solution in terms of clinical and laboratory parameters including appetite and nutritional status. This prospective study included 60 patients (mean age, 42.4 ± 13.1 yr; M/F, 23/37; mean PD duration, 54.3 ± 24.8 months) receiving continuous ambulatory PD (CAPD) treatment. All patients had at least 6 months baseline period using the standard lactate solution, followed by 12 weeks either bicarbonate/lactate solution (B/L group; n = 21) or lactate-based solution (L group; n = 39). Demographic and clinical features were recorded and laboratory evaluation was performed at baseline and at week 12. The malnutrition-inflammation score (MIS) was used to evaluate nutritional status at baseline and the end of the 12 weeks. All patients' appetite status was classified based on question about dietary intake to take part in MIS evaluation: good, fair, and poor appetite. B/L and L groups were similar according to demographic features (age, 43.3 ± 13.4 vs. 40.8 ± 12.5; M/F, 18/5 vs. 21/16; PD duration, 56.8 ± 23.0 vs. 45.6 ± 24.7; *P* > 0.05), laboratory results (hemoglobin, 11.4 ± 1.3 vs. 10.8 ± 2.2; creatinine, 10.1 ± 2.1 vs. 10.4 ± 2.8; albumin, 3.8 ± 0.5 vs. 3.9 ± 0.5; C-reactive protein, 8.5 ± 6.5 vs. 7.7 ± 7.5; ferritin 402.2 ± 335.6 vs. 468.7 ± 352.6; parathyroid hormone 346.4 ± 242.3 vs. 366.7 ± 246.6; *P* > 0.05), comorbidity index (2.7 ± 1.3 vs. 2.5 ± 1.0; *P* > 0.05), and MIS value (9.0 ± 2.8 vs. 9.2 ± 2.9; *P* > 0.05) at the baseline. While mean MIS value remains stable in group L, it significantly declined in group B/L and there was significantly difference between groups at the end of the 12 weeks (9.0 ± 2.7 vs. 7.2 ± 2.3; *P* = 0.02). Analysis of variance with repeated measures showed a significant group-time interaction in MIS value (*P* = 0.01), CRP (*P* = 0.006) and albumin (*P* = 0.004), no significant group-time interaction in other parameters (systolic and diastolic blood pressure, body mass index, hemoglo-

bin, calcium, phosphorus, parathyroid hormone, ferritin, erythropoietin requirement). When patients' appetite status was evaluated at baseline and week 12, ratio of patients who had good appetite status rose from 47.6% to 76.2% in-group B/L and remained stable as 38.5% and 43.6% respectively in-group L. In conclusion; B/L solutions have good impact on nutritional status in PD patients probably via to increase appetite and to decrease inflammatory status. This property makes this solution as a preferred alternative to conventional solution.

Oral Presentations—Heart

6

In-Line Blood Viscometer for Extracorporeal Circulation

Onur Koçak¹, Sevgi Uluçay¹, Cengiz Koçum¹,
Mustafa Kocakulak¹⁻²

¹Başkent University, Biomedical Engineering
Dept., Ankara, Turkey, ²University of Pittsburgh
Medical Center, McGowan Institute for
Regenerative Medicine, Pittsburgh, PA, USA

In this study, a quartz crystal microbalance viscometer (QCM) has been constructed. The technique was based on the principle of piezoelectric effect of quartz crystals. The QCM biosensor has two main parts which are oscillator circuit and flow cell. The QCM has a high frequency surface sensitive method for various biosensor applications. The QCM consists of an AT-cut piezoelectric quartz crystal disc with metallic electrode films deposited on its faces. The sensor sensitivity is achieved by the usage of a 4 MHz quartz crystal operating in an enclosed flow cell. Oscillator circuit was designed and built on to printed circuit board. The Colpitts oscillator was chosen as an oscillator with buffer amplifier. In the flow cell the blood sample flows radially outward from the input port at the center of the cell to the exit channel at the edge of the cell. The sample solution is perpendicularly pumped towards the flat surface of the QCM crystal. The stagnation point is located at the center of the crystal electrode, overlapping the area of highest sensitivity of the QCM oscillator. The cell creates a flow chamber of small prime volume (~0.15 mL). The flow cell is made of polymeric material and includes inlet and outlet ports. The flow system consists of low pressure connection to an extracorporeal circuit. This study is supported by Tubitak Research Grant 105M270.

7

From Concept to the Prototype of Heart Turcica Centrifugal: Development of the First Implantable Centrifugal Left Ventricular Assist System in Turkey

I. Lazoglu¹, O. Demir¹, G. Yildiz¹, C. Ersanli¹, S. Kucukaksu², A. F. Okyar³, N. Ciblak³, M. Sehirlioglu⁴, M. Akgun³, E. Sorguven³, H. Ahn³, K. Safak³, N. Egrican³

¹Manufacturing Automation and Research Center, Department of Mechanical Engineering, Koc University, Istanbul, ²Department of Cardiovascular Surgery, Yeditepe University Hospital, Istanbul, ³Mechanical Engineering Department, Yeditepe University, Istanbul, ⁴Department of Electrical and Electronics Engineering, Yeditepe University, Istanbul, Turkey

A prototype of a new implantable centrifugal heart pump was developed as a Left Ventricular Assist Device (LVAD) for the treatments of end-stage cardiac failures. In the development of Heart Turcica Centrifugal (HTC), Computational Fluid Dynamics (CFD), Computer Aided Design/Engineering/Manufacturing (CAD/CAE/CAM) tools were utilized in various stages from conceptual design to the final prototype. In this research, flow and performance characteristics of various centrifugal blood pumps were analyzed in detail. A prototype of HTC was manufactured with high precision by the high speed production techniques in Computer Numerical Control (CNC) machines. In this conference, the development stages of the HTC are introduced and the results of the in vitro tests of the HTC are presented. This study is supported by Tubitak Research Grant 106M309

8

First Heart Transplantation Following VAD Bridging in Turkey

Mehmet Ali Özatik*, Şeref Alp Küçüker*, Gökten Aşkın*, Onurcan Tarcan*, Kerem Vural*, Süha Küçükaksu**, Erol Şener***, Oğuz Taşdemir****

*Cardiovascular Surgery Dept., Türkiye Yüksek İhtisas Hospital, Ankara, **Cardiovascular Surgery Dept., Yeditepe University Hospital, İstanbul, ***Cardiovascular Surgery Dept., Atatürk Eğitim ve Araştırma Hospital, Ankara, ****Özel Akay Hospital, Ankara, Turkey

Use of left ventricular assist device for bridging to heart transplantation is a life saving procedure among patients with end stage heart failure. Forty

year old male patient with idiopathic dilated cardiomyopathy, who has been followed for the last 20 months as a candidate for heart transplantation, could not be transplanted due to lack of a suitable donor. He was put on a high dose inotropic and intra aortic balloon pump support along with an urgent call for a suitable organ. Unfortunately his condition kept deteriorating and a MicroMed DeBakey left ventricular assist device was inserted and IABP support was discontinued. While patient was on VAD support his condition improved and his inotropes were tapered and later discontinued and patient became ambulatory. On the 161th day of the VAD support a suitable organ was finally found and the patient was transplanted. During his VAD support period no adverse events occurred and hemodynamic parameters improved. This is the first ever patient in Turkey who received a heart transplantation by bridging with LVAD and he is now in his post-transplant 5th year without any medical problem.

9

International Management of an End-stage Heart Failure Patient with Assist Device to Transplantation

Tahir Yagdi, Cagatay Engin, Bortecin Eygi, Serkan Ertugay, Pelin Ozturk, Soysal Turhan, Dilsad Amanvermez, Sanem Nalbantgil, Hakan Posacioglu, Semih Buz, Roland Hetzer, Mustafa Ozbaran

Ege University Hospital, Department of Cardiovascular Surgery, Izmir, Turkey

A forty-two-year-old male patient suffered from dilated cardiomyopathy and pulmonary hypertension. He came off with end-stage findings and so he had an INCOR left ventricular assist device (Berlin Heart AG, Berlin, Germany) implanted in Deutsches Herzzentrum Berlin, Germany in March 2006. After implantation he came to Turkey and he was registered to the heart transplantation list. His systolic pulmonary artery pressure dropped to 30 mmHg from 100 mmHg after implantation at his 8th month on the pump. A regional wound infection was detected at the site of power cable with the collected positive cultures of *S. aureus*. Although he received an adequate antibiotherapy, the infection was not eradicated. Thus, he was moved to emergency list. His Incor device was successfully replaced with a donor heart after 1 year survival on the pump support in Turkey. To the best of our knowledge this is the first case report of cross-regional “bridge to transplantation” case.

10

The First Implantation of DeBakey VAD for Destination Therapy in Turkey

Kucukaksu DS¹, Wieselthaler G², Goksedef D¹, Yildiz C¹, Bayrak F³, Degertekin M³, Demirtas, E³.

¹Yeditepe University Hospital, Department of Cardiovascular Surgery, Istanbul, Turkey,

²Univ-Klinik für Chirurgie (MUW), Klin.Abt. für Herz-Thoraxchirurgie, Vienna, Austria,

³Department of Cardiology, Yeditepe University Hospital, Istanbul, Turkey

Congestive heart failure (CHF) is currently an important clinical and public health problem with an incidence of 2.5% beyond 45 and 10% beyond 65 years of age. End stage heart failure is the most malign, difficult and expensive phase of the disease and 1 year survival is nearly 25%. It is reported that the patients who have inotrope-dependent heart failure have only a mean survival of 3.4 months and a 1-year survival rate of only 6%. Cardiac transplantation and its impact is limited severely by the number of available donors. Left ventricular assist devices (LVADs) have been used successfully for many years as a bridge to transplantation. The results of this group encouraged the medical society to use LVADs in the group of patients who are not suitable for cardiac transplantation to improve survival and quality of life and this indication gained popularity with the final reports of the REMATCH (*The Randomized Evaluation of Mechanical Assistance for the Treatment of Congestive Heart Failure*) study in 2002. In this report, the results of an implantation of Micromed DeBakey LVAD device to an inotrope-dependent and transplantation contraindicated patient which is the first case in our country with the indication of destination therapy are presented and discussed under the current literature.

11

Mechanical Cardiac Support in the Adult with the Berlin Heart EXCOR Pulsatile Ventricular Assist Device: Report of the First Two Cases

Mustafa Ozbaran, Tahir Yagdi, Cagatay Engin, Serkan Ertugay, Bortecin Eygi, Pelin Ozturk, Soysal Turhan, Sanem Nalbantgil, Afksendiyos Kalangos, Isa Durmaz
Ege University Hospital, Department of Cardiovascular Surgery, Izmir, Turkey

The adult-size pneumatically driven pulsatile extracorporeal ventricular assist device (VAD) Berlin Heart EXCOR (Berlin Heart Mediprodukt GmbH, Berlin, Germany) was introduced into clinical prac-

tice by the Ege university in 2007. We report of the first two patients. Berlin Heart EXCOR systems (left ventricular) have been used for circulatory support in 2 adult male patients (54 and 61 years old). These were patients suffering from dilated and ischemic cardiomyopathy and severe circulatory failure resistant to pharmacologic therapy. Postoperative anticoagulation was managed with thromboelastogram. Postoperative courses are uneventful and all patients are waiting for transplantation under VAD support. The role of ventricular-assist devices in the management of end-stage heart failure is growing and we discussed indications, postoperative care and optimal timing for VAD implantation.

Oral Presentations—Kidney/Pancreas/Skin/Blood

12

Risk Factors for Insulin Resistance in Peritoneal Dialysis Patients

Arzu Akgül, Serkan Koc, Siren Sezer, Mujdat Batur Canöz, F. Nurhan Ozdemir
Baskent University Faculty of Medicine, Department of Nephrology, Ankara, Turkey

Insulin resistance (IR) is a common problem in peritoneal dialysis (PD) patients and is one of the important atherosclerotic risk factors. Several factors impact on IR in PD patients. Studies indicated that fetuin inhibits insulin-induced insulin receptor autophosphorylation and tyrosine kinase activity in vitro and may play a significant role in modulating insulin sensitivity in vivo. But there is no data relationship between serum fetuin-A level and IR in PD patients. Our aim in this study was to investigate whether serum fetuin-A levels effect development of IR and risk factors for IR in PD patients. We included 30 PD patients (16 male, mean age 31.8 ± 11.9 years, mean dialysis duration 55.12 ± 21.6 months). All patients were analyzed as IR risk factors including body mass index (BMI), central body fat distribution, medications, lipid parameters, serum fasting glucose, insulin, parathyroid hormone and fetuin-A level. IR was calculated using the homeostasis model assessment (HOMA) score. Peritoneal transport characteristics were identified after a peritoneal equilibration test (PET) determined of CAPD using Dialysate/Plasma (D/P) reference values. HOMA score was not correlated with central body fat distribution, cholesterol, triglyceride, low-density lipoprotein, fetuin-A and PET but correlated with BMI (r = 0.363, P < 0.05), parathyroid hormone (r = 0.466, P < 0.05) and calcium (r = 0.353, P < 0.05) in PD

patients. Additionally, fetuin-A inversely correlated with albumin ($r = 0.544$, $P < 0.05$), but not correlated with other parameters. In conclusion, there is no effect of fetuin-A on development of IR in PD patients but BMI, parathyroid hormone and calcium are important factors for IR in these patients.

13

Six Month Control Of Diabetes By Transplantation Of Encapsulated Pig Islets In Diabetic Primates Without Immunosuppression

D. Dufrane, R.M. Goebbels, P. Gianello
Université Catholique de Louvain, Belgium

Objective: This study assessed the capacity of alginate encapsulated islets to reverse diabetes in “pig to primate” model. **Methods:** Adult pig islets were encapsulated in microcapsules and implanted under the kidney capsula of 4 STZ-treated primates or in subcutaneous macrodevice in 4 additional diabetic animals. As controls, primates received non-encapsulated pig islets ($n = 2$) or empty capsules ($n = 2$). Body weight, glycosuria, polydipsia, polyuria, fasting blood glucose (FBG), insulin, porcine C-peptide, HbA1C and anti-pig antibodies were evaluated in sera. Immunostaining for CD3, CD68, C3, C9 were performed on explanted grafts. **Results:** Diabetes was confirmed by a significant elevation of FBG and HbA1C ($\&\#8805;13\%$), as well as glycosuria (1000 mg/dl), polydipsia, polyuria and body weight lost (-28%). Non-encapsulated pig islets were rejected within 7 days as evidenced by loss of function and cellular/humoral responses. Although a significant reduction of FBG (<200 mg/dl) and a transient increase of insulin and porcine C-peptide levels were observed during 2 weeks after micro-encapsulated pig islets implantation, a gradual decline of function was observed after 6 weeks. After subcutaneous transplantation of a macrodevice, diabetes was corrected up to a maximum of 6 months: FBG ranged between 52–107 mg/dl, glycosuria was undetectable and HbA1C (after 16 weeks) reached $8 \pm 1.4\%$. Among the four animals, two were retransplanted with a new macrodevice between 25 and 35 weeks after the first graft whereas the latter clearly dysfunctioned (FBG > 153 mg/dl, glycosuria, HbA1C $\&\#8805;13$). Diabetes was completely controlled again as evidenced by HbA1C (7.4–9.8%) ten weeks after retransplantation. Immunohistology demonstrated no sign of graft rejection. **Conclusions:** Adult pig islets encapsulated in a subcutaneous Macrodevice can completely reverse STZ-induced diabetes up to 6 months without immunosuppression.

14

Peritoneal Albumin Leakage: 2-Year Prospective Cardiovascular Event Occurrence and Patient Survival Analysis

Rengin Elsurer¹, Baris Afsar¹, Siren Sezer¹, Zubeyde Arat¹, F. Nurhan Ozdemir¹ and Mehmet Haberal²

¹Department of Nephrology, and ²Department of General Surgery, Baskent University Hospital, Ankara, Turkey

Introduction and Aims: High peritoneal membrane transport status is a determinant of morbidity and mortality in patients undergoing peritoneal dialysis. Patients characterized as high peritoneal transporters are prone to peritoneal fluid protein loss and a low serum albumin concentration. We investigated whether 24-hour peritoneal albumin leakage was associated with 2-year prospective cardiovascular outcome and survival in patients receiving peritoneal dialysis (PD). **Methods:** Totally, 66 patients (male/female ratio: 30/36, age: 46.2 ± 14.1 years, mean duration of chronic renal failure: 67.8 ± 51.9 months; mean duration of PD, 32.4 ± 23.9 months) were included in the study. Forty-nine patients were on continuous ambulatory peritoneal dialysis and 17 patients on automated peritoneal dialysis. A simplified peritoneal equilibration test was performed at 4-hour of dwell, and the 24-hour peritoneal albumin leakage was calculated. Patients were followed up for 2 years. Patient outcome (alive or dead) was determined and occurrence of a cardiovascular event was recorded. We used a composite end-point of cardiovascular event, which included fatal/nonfatal myocardial infarction, fatal/non-fatal stroke and sudden cardiac death. **Results:** Mean 24-hour peritoneal albumin leakage was 3.3 ± 2.6 g/day (range: 0.76–15.43 g/day). Peritoneal albumin concentration ($P < 0.0001$) and 24-hour peritoneal albumin leakage ($P < 0.0001$) were significantly higher in high average-high transporters than in low average-low transporters. Serum albumin ($P: 0.02$) and prealbumin ($P < 0.0001$) concentrations were lower in high average-high transporters than in low average-low transporters. During the 2-year follow-up period, 10 (15.2%) patients had suffered from a cardiovascular event and 7 (10.6%) patients had died. Kaplan-Meier analysis of surviving proportions demonstrated that the 2-year patient survival was significantly lower in patients who had suffered from a cardiovascular event than patients who had not (53.9% and 98.1% respectively, $P < 0.0001$). Cox proportional hazards univariate analysis revealed that only advanced age (RR: 1.089, 95% confidence interval: 1.016–1.168, $P:$

0.017) was a predictor of a cardiovascular event. Sex (RR: 0.856, 95% confidence interval: 0.227–3.226, P: 0.818), diabetes mellitus (RR: 0.426, 95% confidence interval: 0.053–3.423, P: 0.422), dialysate/plasma creatinine ratio (RR: 0.058, 95% confidence interval: 0.001–2.342, P: 0.058) and 24-hour peritoneal albumin leakage (RR: 0.922, 95% confidence interval: 0.691–1.230, P: 0.581) were not predictors of a cardiovascular end-point. In the Cox proportional hazards multivariate analysis, only advanced age was an independent predictor of a cardiovascular event (RR: 1.086, 95% confidence interval: 1.006–1.172, P: 0.034). **Conclusions:** In conclusion, occurrence of a cardiovascular event is associated with a lower 2-year patient survival. Advanced age is an independent predictor of a cardiovascular event, whereas peritoneal transport status and albumin leakage are not the predictors.

15

Is Free T3 an Inflammation-Malnutrition Parameter in Patients Under Hemodialysis?

Siren Sezer, Alpaslan Altunoglu, Müjdat Batur Canoz, Demet Yavuz, Nurhan Ozdemir, Mehmet Haberal
Baskent University Faculty of Medicine,
Department of Nephrology, General Surgery
Ankara, Turkey

Background: Low free triiodothyronine (fT3) is an euthyroid syndrome marker used in various acute and chronic diseases. Thyroid function is frequently altered and the association of low fT3 with survival has been defined in hemodialysis (HD) patients. In the present study, we investigated the factors influencing the fT3 levels in HD patients and investigated the significance of fT3 level as a marker of inflammation and nutritional status. **Methods:** 84 HD patients (38 Male, 46 Female; Age 56.2 ± 14.76 years, HD duration: 95.72 ± 10.35 months) were included. Patients with evidence of acute or chronic infection, history of hospitalization, those having chronic inflammatory disease, history of radioactive iodine therapy, irradiation and thyroid disease were excluded. Data comprising age, concomitant diseases, comorbidities, and duration of HD, a blood panel consisting of serum fT3, TSH, calcium, phosphorus, CRP, albumin, hemoglobin, serum iron levels and iron combining capacity was obtained from the patients. Malnutrition-inflammation score (MIS) and co-morbidity assessed by Charlson comorbidity index (CCI) was recorded for each patient. Additionally, HD patients were asked about their appetite status on a scale from 1 to 4 (very good,

good, fair, and poor appetite, respectively). The normal cut-off range set by the laboratory for fT3 was 1.9–4.2 pg/ml. Linear regression analysis was used to assess the associated factors related with fT3, age, CRP, albumin, MIS and CCI were added as independent variable. **Results:** The mean fT3 level of our patients was: 2.1 ± 0.4 pg/ml and 24% were in lower range interpreted as sick euthyroid syndrome. Women had significantly higher fT3 values compared with men ($p = 0.03$). fT3 was negatively correlated with age ($r = -0.328$, $P = 0.002$), CCI ($r = -0.591$, $P = 0.0001$), serum CRP value ($r = -0.299$, $P = 0.01$) and MIS ($r = -0.671$, $P = 0.0001$) while it was positively correlated with albumin ($r = 0.389$, $P = 0.0001$). In women, fT3 was negatively correlated with age ($r = -0.425$, $P = 0.003$), CCI ($r = -0.577$, $P = 0.0001$), MIS ($r = -0.673$, $P = 0.0001$); while it was positively correlated with albumin ($r = 0.509$, $P = 0.0001$). Meanwhile, in men fT3 was negatively correlated with serum CRP ($r = -0.348$, $P = 0.041$), MIS ($r = 0.653$, $P = 0.0001$), CCI ($r = -0.575$, $P = 0.0001$) and it was positively correlated with hemoglobin level ($r = 0.505$, $P = 0.001$) and serum iron values ($r = 0.411$, $P = 0.017$). Appetite score and MIS was significantly higher in patients with low fT3 levels ($P = 0.001$). Linear regression model including age, CCI, CRP, albumin and MIS revealed that MIS ($P = 0.003$, $\beta = -0.469$, $R^2: 0.52$) was the most significant factor influencing fT3 levels. **Conclusion:** The results of this study strongly indicate that both nutritional status and inflammatory response are significantly correlated with fT3 in HD patients. fT3 can be accepted as an inflammatory marker and accompanying component of MIS in dialysis patients.

16

Biocompatible Polyurethane Membranes For Wound Healing Applications

Guncem Gultekin¹, Cigdem Atalay-Oral², Sibel Erkal³, Fikret Sahin⁴, Djursun Karastova⁴, S. Birgul Tantekin-Ersolmaz², F. Seniha Guner²
¹Istanbul Technical University, Institute of Science and Technology, Material Science and Engineering Department, Istanbul-Turkey. ²Istanbul Technical University, Chemical Engineering Department, Istanbul-Turkey. ³University of Ankara, Cebeci School of Health, Altindag, Ankara, Turkey. ⁴Ankara University, Faculty of Medicine, Microbiology and Clinical Microbiology, Ankara, Turkey

Fatty acid-based polyurethane membranes were prepared as wound dressing materials. The polymeriza-

tion reaction was carried out at 90–95°C under inert gas atmosphere with catalyst for 3.5 hours (PU-WC) or without catalyst for 15 hours (PU-NC). Reactions were monitored by FTIR measurements. The polymer structures were confirmed by NMR. Polymer membranes were prepared by casting-evaporation technique (Figure 1a) with (PU-WC-c and PU-NC-c) or without crosslinker (PU-WC-nc and PU-NC-nc). Wide angle X-ray scattering were used to determine the morphology of films. Polyurethane membranes prepared from uncatalyzed-reaction product were partially crystalline. Thermal properties were determined by TGA and DSC measurements. The T_g 's of polyurethane films prepared with crosslinker were found higher than that of films prepared without crosslinker. The effects of the crosslinker on dynamic mechanical properties were determined by DMA. It was determined that the film prepared from uncatalyzed reaction product with crosslinker had slightly higher crosslink density. As a result of mechanical tests it was found that the increase in the tensile strength and decrease in the elongation at break is due to the increase in the crosslinking degree. In addition to these properties, the membranes were characterized for their film coating and water absorption properties. The membranes prepared without crosslinker are more hydrophilic. They were transparent (Figure 1b) and flexible. They showed high gas permeabilities. For determination of cytotoxicity of polymer films two methods were applied, direct contact and MMT tests. Polyurethane membrane prepared from catalyzed reaction product without crosslinker showed the best biocompatibility (Figure 2). This research is partially funded by the State Planning Organization (DPT) of Turkey.

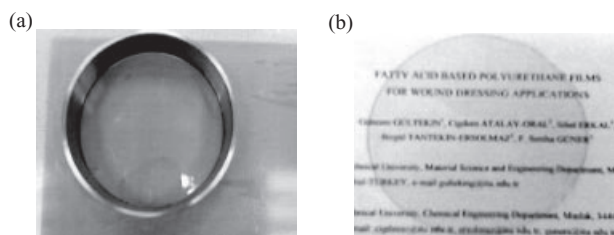


Figure 1. Polyurethane membrane

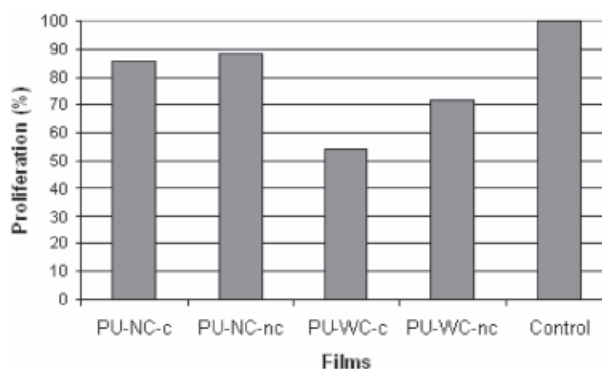


Figure 2. The cell proliferation on polymer films

17

Autologous Hematopoietic Stem Cell Transplantation for Lymphoma and Myeloma at Yeditepe University Hospital

Sabiha Yüce, Gulcin Kalayci, Sema Aktas, Didem Aydin, Basak Oyan, Yener Koc
Stem Cell Transplant Unit, Yeditepe University Hospital, EBMT CIC-919, Turkey

Introduction: Stem cell transplantation (SCT) is an effective treatment modality in hematological malignancies. SCT Unit at Yeditepe University Hospital (CIC-919) was activated in October 2005 and accredited for unrelated SCT by EBMT in April 2007. **Materials and Methods:** Until April 2007, a total of 26 autologous transplantations were performed for 18 patients with lymphoma (9 NHL, 9 HL) and 8 patients with myeloma. Patients with lymphoma received high-dose sequential chemotherapy consisting of HDVP16 followed by HD-MTZ+HD-MEL preparative regimen after IIVP or HIDAC+HDMTX salvage regimens. Patients with myeloma received HD-MEL at 200 mg/m² if they are less than 70 years of age, and 140 mg/m² over 70 years of age. **Results:** Median age was 43,5 (13–71) years and mean time from diagnosis to transplant was 2,1 years. Lymphoma patients received a mean number of 8 (2–18) salvage regimens prior to transplantation. All patients engrafted and median engraftment period was 13 (9–24) days. Median follow-up period was 7 (1–18) months. During follow-up of 18 patients with lymphoma, 4 patients (22%) relapsed and none died during the follow-up period. 2 of these patients are induced into CR, one following allogeneic transplantation and the other following radiotherapy combined with R-EPOCH regimen. DFS for lymphoma patients at 18 months is 73.3% at 18 months. Of 8 patients with myeloma, 2 patients (25%) relapsed, and one patient was found to be refractory to HD-MEL preparative regimen. The

patient with refractory disease is currently in CR following an unrelated allogeneic stem cell transplantation. Of 2 patients with progressive disease, 1 is currently in CR following 2 cycles of EPOCH regimen and the other died secondary to progressive disease. **Complications:** Post-transplant complications were DVT, transient hyperbilirubinemia, sleep apnea related cardiac arrest which responded to resuscitation (n = 1 each). A patient with myeloma experienced transient congestive heart failure in and HBV hepatitis following a dental procedure. **Conclusion:** All patients were alive following auto-SCT at day +100 (TRM = 0%), only one patient with myeloma died due to relapse at 9 months. At present, of 25 surviving patients, 20 are assessed for response and 18 of these patients are in CR. The high survival rate (96%) achieved following autologous SCT, low (TRM = 0%) and the high remission rate (90%) may be related to team approach, 24-hour patient follow-up, and effective management of complications encountered during early transplant period. Patients with lymphoma or myeloma relapsing following autologous transplantation can be successfully salvaged by a second allogeneic transplantation procedure.

18

Long-Term Effect Of Low-Density Lipoprotein Apheresis: Experience In Four Children With Familial Homozygous Hypercholesterolemia

F. Tuba Eminoglu*, İdil Yenicesu**, İlyas Okur*, Leyla Tümer* and Alev Hasanoğlu*

*Gazi University, Faculty of Medicine, Department of Ped. Metab. Nutr., **Gazi University, Faculty of Medicine, Department of Ped. Hematology, Ankara, Turkey

Heterozygous familial hypercholesterolemia affects one in every 500 persons and is the most common cause of markedly elevated cholesterol levels in children. In children with heterozygous familial hypercholesterolemia, the short-term risk of clinical events is low; therefore, managements starts with stratification of risk, followed by dietary modification, and in high-risk cases, pharmacologic treatment initiated after puberty. But children with homozygous familial hypercholesterolemia require expert management with LDL apheresis, high doses of effective statins and cardiologic follow-up. LDL apheresis has been widely accepted as an effective treatment for hypercholesterolemic patients who are resistant to drug and conventional therapy such as in case of familial hypercholesterolemia. There are various techniques for performing LDL apheresis including heparin-

induced extracorporeal LDL precipitation, specific immunoabsorption, double membrane filtration, dextran sulphate adsorption (liposorber) and direct adsorption of lipoproteins. The purpose of the present study was to clarify the efficacy and safety of LDL apheresis in children with familial hypercholesterolemia. Four girls aged between 12 and 16,2 years old with familial hypercholesterolemia who were highly resistant to dietary regimens and to drug therapy were treated with double membrane filtration and direct adsorption of lipoproteins once every 2 weeks. Duration of treatment was between 8 and 25 months. One patient who received direct adsorption of lipoprotein (DALİ) had severe anaphylactic reaction. Apheresis was effective in the remaining 3 patients. In our patients the acute mean LDL cholesterol reduction was $51.2 \pm 4.2\%$. Based on this evaluation we conclude that DALİ and double membrane filtration were effective in children with familial hypercholesterolemia.

19

Beneficial Effect Of Plasmapheresis In Three Patients With Myasthenia Gravis

Meral Sönmezoğlu*, Geysu Karlıkaya**, Nazire Afşar**, Canan Aykut Bingöl**

*Blood Bank, **Department of Neurology, Yeditepe University Hospital, Istanbul, Turkey

Myasthenia gravis (MG) is an autoimmune disease which affects the neuromuscular junction, producing weakness of the voluntary muscles. Typically weakness tends to worsen with exercise and at the end of the day, while it usually improves by rest. Pathologic findings in myasthenia are localized to the motor end plate structures on the myocyte side of the neuromuscular junction. It is well established that damage to motor end plates in myasthenia is mediated by IgG antibodies directed against a portion of the α -subunit of the acetylcholine receptor (AChR). Such antibodies can be demonstrated by various assays in the serum of 80–90% of patients with MG. Treatment consists of drug therapy including anticholinesterase agents, corticosteroids, and other immunosuppressive agents, and thymectomy. In patients who do not respond well to these treatments, or patients who are in myasthenic crisis, plasmapheresis (therapeutic plasma exchange-TPE) can serve as an effective treatment modality to improve muscle weakness. TPE can remove AChR antibody, leading to lowered plasma levels after repeated treatment that correlates well with clinical improvement. Efficacy of TPE in MG is widely accepted by ASFA and

AABB in indication Category I. In this study, three patients who were hospitalized with a diagnosis of MG (one with myasthenic crisis, 2 with severe muscle weakness due to MG) and either did not respond to drug therapy or due to drug unavailability, underwent plasmapheresis. A total of 14 TPE were performed in three patients (1 female 20 years of age, and 2 male 14 and 84 years of age). Plasma exchange was performed with 5% albumin solution as replacement fluid. No side effects were observed during the procedures. One patient who was intubated was followed in ICU. All patients profoundly improved after TPE. We conclude that TPE was effective in MG patients who do not improve with drug treatment.

20

Magnetic Stimulation As An Alternative Strategy For Implantable Auditory Neural Stimulators

Cem Devge*, Söhrap Resuloğlu**

*Yeditepe University, School of Medicine, Department of Otorhinolaryngology, Istanbul,

**Marmara Research Center, Space Technologies, TUBITAK, Kocaeli, Turkey

Aims of the Study: Electromagnetic stimulation (EMS) is used in neurology and otolaryngology for non-invasive stimulation of the brain and facial nerve. We performed experimental trials designed to evaluate the utility of a directional electromagnetic (EM) energy that passes through the otic capsule, on the auditory nerve stimulation. Therefore, the purposes of this study were to determine the following: 1. the auditory sensation effects of various frequency, different flux density, and d_B/d_t waveforms of EM energy; 2. whether the site and depth of a lateral cochlear wall electromagnetic inductor (EMI) affects the pattern of evoked responses; 3. the dynamic range of activation of the auditory pathway with extraluminal EMS; 4. whether successful activation of the auditory nerve is possible without adventitial stimulation of the facial nerve; and 5. the effects of long and short-term EMS on cytoarchitecture of the cochlea. **Methods:** Effects of electromagnetic stimulation on auditory brainstem evoked responses & electro-cochleographical records and neuroanatomical structures in the auditory tract were investigated in normal and twenty oto-toxically deafened rabbits exposed to magnetic stimulation transcranial-transcutaneously with a magnetic coil positioned over the mastoid and temporal lobe, and percutaneously with a generator implanted into the middle ear cavity (bullae) or mastoid antrum. Measurements for

percutaneous magnetic stimulations with implantable generators were made on different distances from the cochlea. Serial sections of the temporal bone, the cochlear nucleus and inferior colliculus were examined by light and electron microscopy. **Results:** Threshold and saturation EM fields, as well as EM energy needed to activate the facial nerve, were also recorded. Very short (180 mm) pulses with a rate of change of magnetic flux density of about 10000 T/s have also been used to stimulate the auditory sensations. A mean auditory stimulation threshold in normal rabbits was about 60 T/s (peak) for 1.27 kHz sinusoidal fields. In some rabbits the auditory stimulation effects observed at threshold stimulation were more marked with pulse duration of 0.5 ms than with 0.01 or 0.1 ms. We also described a threshold of auditory perception of about between 8000 and 15000 T/s in human volunteers whose mastoid region was exposed to a damped sinusoidal magnetic field. The lowest threshold occurred when the magnetic field vector was orthogonal to the long axis of the body, a reflection of the larger inductive current loop radius. No adventitial stimulation of the facial nerve was noted within the dynamic range of the axial shielded implantable EMI. The magnetically induced middle latency responses (MLRs) were compared with the acoustically induced MLRs and electrically induced MLRs, and the curves of the magnetically induced MLRs were identical with the acoustically induced MLRs. In both normal and ototoxically deafened animals which were exposed to the high intensity-high frequency and larger pulse-width (PW) magnetic field exposure starts to appear to have its damaging effect mainly on the outer hair cells and outer pillar cells in the basal regions at the end of a couple of days. **Conclusion:** This approach to extracochlear stimulation demonstrates encouraging performance characteristics in achieving auditory activation. These implants in direct contact with the bony wall of the cochlea which can potentially provide access to upper turns of the cochlea may also complement intrascalar cochlear implants in stimulating the auditory nerve and providing spectral encoding. Short stimulus PW may also have additional characteristics which will be found in the future studies and are beneficial to the performance of neural prostheses. This alternative strategy deserves further studies as a non-invasive procedure for evaluating potential cochlear implant patients.

Oral Presentations—Heart/Vessels

21

QCM Biosensor for Real-time Anticoagulation Monitoring

Nazli N. Sözmen¹, Onur Koçak¹, Aykut Erdamar¹, Cengiz Kocum¹, Hakan Ayhan², Mustafa Kocakulak¹⁻³

¹Başkent University, Biomedical Engineering Department, Ankara, Turkey, ²Mugla University, Chemistry Department, ³Mugla, Turkey, ³University of Pittsburgh Medical Center, McGowan Institute for Regenerative Medicine, Pittsburgh, PA, USA

This study attempted to measure real-time heparin concentration by using quartz crystal microbalance (QCM) as a biosensor. QCM biosensors monitor changes of resonant frequency (Δf) of the adsorbed layers on the sensor surfaces. By immobilizing protamine on the crystal surface as the affinity ligand, the frequency change of the crystal can be measured. Protamine solution was interacted with the crystal, and immobilization of protamine was followed by QCM sensor. After a period for incubation of protamine solution, a buffer solution containing definite concentration of heparin was interacted with the crystal surface. The heparin was allowed to react with the protamine layer adsorbed on the gold electrode of QCM for a specific time interval. During immobilization of protamine and measurement of heparin, changes in resonance frequency of QCM were continuously monitored. In conclusion, no approved heparin sensor or system has yet been developed to determine the real-time heparin concentrations, particularly for high-risk conditions such as surgery or cardiac catheterization with a high (>3 U/ml) or medium (0–3.0 U/ml) dose of heparin. Finally the measurement of the mass of the heparin which immobilized on to the surfaces of the crystal was realized by this method. This study is supported by Tubitak Research Grant 105M270

22

Open and Endovascular Hybrid Approach In The Treatment Of Diffuse Aortic Aneurysms

Harun Arbatlı¹, Oğuz Yılmaz¹, Gökçe Şirin¹, Ergun Demirsoy¹, Naci Erciyes Yağan¹, Fűrüzan Numan², Bingür Sönmez¹

¹Cardiovascular Surgery Dept., ²Invasive Radiology Dept., Memorial Hospital, İstanbul, Turkey

Background: Diffuse aortic diseases such as mega-aorta, multisegmenter aneurysms or Marfan syndrome are usually treated with staged operations.

However, many patients have been lost in the waiting period between these operations. Nevertheless, single stage repair of the whole aorta has extremely high morbidity and mortality rate. The combination of endovascular graft replacement with open surgical procedures has allowed less invasive treatment method in a short time period in these vulnerable patient populations. **Patients and Methods:** Between November 2002 and March 2007, 11 patients who have diffuse aortic disease were enrolled in this retrospective study. The objectives of this study were to present our experience in these patients treated with hybrid (endovascular + open surgery) therapy. **Results:** Mean age at the time of operation was 61.1 ± 13.4 years; three patients were women and eight were man. Ascending aorta, descending thoracic aorta and abdominal aorta were treated in three patients, descending thoracic aorta and abdominal aorta in seven patients. In one patient, both ascending aorta and descending thoracic aorta were treated because of acute type I aortic dissection. Mean follow-up of patients was 33.1 ± 4 months. Type I endoleak was detected in one patient and endograft migration was seen in another patient. Both of them were treated with secondary endovascular intervention. There was no hospital mortality. There was one late death (9.1%) due to intracerebral bleeding. **Conclusion:** Although we had a small patient group, regarding the recent literature for staged or single staged operations, hybrid procedures have less morbidity and mortality. We think that combined open surgery and endovascular interventions in aortic pathologies may lead the treatment of more complicated patients.

23

Clinical Performance and Biocompatibility of Polymethoxyethylacrylate-Coated Extracorporeal Circuits in Different Risk Cohorts

S Gunaydin, T Sari, K Mccusker, V Vijay, MF Sargon, MA Onur, A Gurpinar, A Sezgin, C Atinkaya, T Tezcaner, Y Zorlutuna
University of Kirikkale-Turkey, Bayindir Hospital-Turkey, New York Medical College-USA, State University of New York-USA and Hacettepe University, Turkey

Background: Documented *in vitro* and *ex vivo* advantages of polymethoxyethylacrylate-coated circuits (PMEA) were studied across Euroscore patient risk strata for three different cohorts. **Patients & Methods:** 180 patients undergoing CABG were allocated into two equal groups: Group 1 was treated with PMEA (Capiiox SX 18) and Group 2

with identical uncoated controls. Each group was further divided into three subgroups (N = 30) with respect to low (Euroscore 0–2), medium (3–5) and high (6+) risk patients. Samples were collected after induction (T1) and heparin (T2), 15 minutes after CPB (T3), before cessation of CPB (T4), 15 minutes after reversal (T5), and the first postoperative day (T6). **Results:** No statistically significant differences were observed between study and control groups in low and medium risk cohorts. In high risk patients, platelet counts demonstrated significant differences at T3, T4, T5 and leukocyte counts at T3, T4 in PMEAs ($p \leq 0.05$ vs. control). Albumin and fibrinogen levels were better preserved in PMEAs ($p \leq 0.01$). C3a and IL-2 levels were lower at T3–T5 in study group ($p \leq 0.05$). Postoperative hemorrhage was 468 ± 50 ml in PMEAs and 679 ± 50 ml in control group ($p \leq 0.05$). CKMB and lactate levels demonstrated well preserved myocardium in PMEAs ($p \leq 0.01$). Platelet adhesion on electron microscopy was significantly lower in PMEAs. Amount of desorbed protein on fibers was lower in PMEAs vs. control ($p \leq 0.01$). Cell count on fibers (10^3 mm^{-3}) in tissue culture was 54 ± 3 in PMEAs and 86 ± 0.4 in control ($p \leq 0.05$). **Conclusion:** PMEAs-coated oxygenators modulate inflammatory response, reduce platelet adhesion and protein adsorption and provide a better perioperative clinical status in only high risk patients.

24

Efficacy of Ventricular Assist Device In Hemorrhagic Shock

Murat Sargin, Egemen Tuzun, Branislav Radovancevic, O.H. Frazier
Texas Heart Institute, Cullen Cardiovascular Research Laboratories, Houston, TX, USA

Background: The aim of this study is to assess the efficacy of mechanical cardiac assist in prolonged hemorrhagic shock resuscitation. **Methods:** Hemorrhagic shock was induced in 18 anesthetized calves by exsanguinating arterial blood until the mean aortic pressure dropped to 40 mmHg. Animals were randomized into four groups. Group I (n = 5) was resuscitated by fluid and blood re-administration (FBR) and Group II (n = 4) by FBR and mechanical cardiac assist device (MCAD) support after 30 minutes of waiting period following hemorrhagic shock creation. Group III (n = 4) was resuscitated by FBR and Group IV (n = 5) by FBR and MCAD support after 120 minutes of waiting period following hemorrhagic shock creation. Survival time, cardiac output (CO), left anterior descending artery (LAD) flow and liver and kidney functions were

monitored. Myocardial IL-1, IL-6, TNF MCAD Group down regulation of cardiac inflammation is significant and C-reactive protein (CRP) activity was compared between Group I and II. **Results:** In all Groups mean CO and LAD flow significantly decreased at the end of hemorrhage period. In Group II and IV, survival time, CO and LAD flows were significantly higher than Group I and III, respectively, after resuscitation. Myocardial IL-1, IL-6, TNF and CRP activity significantly altered following hemorrhage. In Group II downregulation of these markers was significantly better than Group I after resuscitation. Recovery was significantly better in Group II than Group IV, possibly due to more profound shock created in Group IV. **Conclusion:** In this experimental study, the use of MCAD in combination with conventional FBR improved survival and end organ recovery, and decreased myocardial inflammatory response after hemorrhagic shock.

25

The Effects Of Surgical Bridging Procedures Among Heart Transplantation Recipients

Gökten Aşkin*, Mehmet Ali Özatik*, Şeref Alp Küçük*, Onurcan Tarcan*, Kerem Vural*, Süha Küçükaksu**, Erol Şener***, Oğuz Taşdemir****

*Cardiovascular Surgery Dept., Türkiye Yüksek İhtisas Hospital, Ankara, **Cardiovascular Surgery Dept., Yeditepe University Hospital, İstanbul, ***Cardiovascular Surgery Dept., Atatürk Eğitim ve Araştırma Hospital, Ankara, ****Özel Akay Hospital, Ankara, Turkey

Background: Heart transplantation is the optimal management for end stage heart failure. However, even in best organ sharing systems only about 10% of the patients get the chance of being transplanted. Alternative surgical procedures, so-called bridging procedures, can be performed for these patients and prolong their life by preventing end-organ damage and augment their waiting period for an optimal donor. **Method:** In Cardiovascular Surgery Clinic at Türkiye Yüksek İhtisas Hospital between May 1998 and May 2005, 26 patients received heart transplantation for end stage heart failure. Eight patients (Group I) had previous bridging operations (3 had high risk coronary artery bypass surgery, 2 had dynamic cardiomyoplasty, 1 had left ventricular reduction surgery and 2 had left ventricular assist device implantation). All the rest of the patients were under medical treatment before transplantation (Group II, n:18). **Results:** There were no differences in preoperative demographic and hemodynamic

findings in between groups. There were statistically significant differences for functional capacity, ejection fraction, pulmonary artery pressure and daily urine output before and after bridging operations for patients in group I. There were no differences in aortic cross clamp and cardiopulmonary bypass time, intensive care unit and hospital staying time, postoperative drainage and early mortality in between two groups. **Conclusion:** Bridging procedures in our experience were very useful for heart transplant candidates with end-stage heart failure both for increasing transplantation waiting time and preventing end-organ failure by increasing patients' quality of life.

26

Novel Therapeutic Strategies for Reducing Complications of Cardiopulmonary Bypass in Different Risk Cohorts: Leukocyte Filtration with Coating

S Gunaydin, T Sari, K Mccusker, V Vijay, Mf Sargon, Ma Onur, A Gurpinar, A Sezgin, C Atinkaya, T Tezcaner, Y Zorlutuna
University of Kirikkale-Turkey, Bayindir Hospital-Turkey, New York Medical College-USA, State University of New York-USA and Hacettepe University-Turkey

Background: Relative benefits of strategic leukofiltration on phosphorylcholine coated extracorporeal circuits (PHISIO) were studied across Euroscore patient risk strata for three different cohorts. **Patients & Methods:** 300 patients undergoing CABG were allocated into two equal groups: Group 1 was treated with continuous leukocyte filtration (LG6 & BC2 filters) on PHISIO (D-903 Avant) and Group 2 with identical uncoated controls without filtration. Each group was further divided into three subgroups (N = 50) with respect to low (Euroscore 0–2), medium (3–5) and high (6+) risk patients. Samples were collected after induction (T1) and heparin (T2), 15 minutes after CPB (T3), before cessation of CPB (T4), 15 minutes after reversal (T5), and the first postoperative day (T6). **Results:** No statistically significant differences were observed between study and control groups in low and medium risk cohorts. In high risk patients, leukocyte counts were lower at T3, T4, T5 in study group ($p \leq 0.05$ vs. control). C3a, IL-2 and %change of CD11b/CD18 levels were significantly lower at T3-T5 in Group 1 ($p \leq 0.05$). Postoperative hemorrhage (ml) was 478 ± 50 in study and 684 ± 50 in control groups ($p \leq 0.05$). Respiratory support time was lower in study group ($p < 0.05$). Incidence of atrial fibrillation was 4 cases in

coated+filtered vs. 17 in control groups ($p \leq 0.01$). Desorbed protein amount on fibers (mg/dl) was 1.7 ± 0.01 in study and 2.2 ± 0.01 in control groups ($p \leq 0.05$). Cell count on fibers (1000 mm^{-3}) in tissue culture was 70 ± 4 in study and 86 ± 0.4 in control groups ($p \leq 0.05$). **Conclusion:** Leukofiltration and coating reduce systemic inflammation, protein adsorption, atrial fibrillation and provide better perioperative clinical status in high risk patients.

27

Analysis and Development of Heart Turcica Axial: Development of the First Implantable Axial Left Ventricular Assist System in Turkey

N. Ciblak¹, A. F. Okyar¹, E. Sorguven¹, M. A. Akgun¹, S. Kucukaksu², H. Ahn¹, K. Safak¹, N. Egrican¹, B. Ozsoy¹, O. Yenigul¹, M. Shirliglu³, I. Lazoglu⁴, E. Budak⁵
¹Department of Mechanical Engineering, Yeditepe University, Istanbul, Turkey, ²Department of Cardiovascular Surgery, Yeditepe University Hospital, Istanbul, Turkey, ³Department of Electrical and Electronics Engineering, Yeditepe University, Istanbul, Turkey, ⁴Manufacturing Automation and Research Center, Mechanical Engineering Department, Koc University, Istanbul, Turkey, ⁵Manufacturing Systems and Industrial Engineering, Sabanci University, Istanbul, Turkey

An extensive parametric design study of some performance characteristics of an axial heart pump is performed. This axial heart pump design, named as Heart Turcica Axial (HTA), is to be used as a Left Ventricular Assist Device (LVAD) in the treatment of end-stage cardiac failures. An existing axial pump model is taken as the baseline. A parametric model is developed that successfully generates the main features of this pump. The baseline model represents a single point in the parameter space. For preliminary analyses, a set of test points are selected in the parameter space around the baseline. Then, pressure increase across the pump and wall shear stress are estimated at the test points using computational fluid dynamics. The pressure increase is an indicator of mechanical pump performance, whereas the wall shear stress is that of the level of hemolysis. After the preliminary analyses, the size of the parameter space is reduced to a manageable size by eliminating certain parameters deemed insignificant. In the second stage, a more refined analysis is performed on the reduced space. The results are quite promising as they indicate which parameters contribute positively to the design goals. Based on the data so obtained, new pump geometry is determined that

has a pressure increase 19% higher and a maximum shear stress 10% lower than the baseline model. This study is supported by Tubitak Research Grant 106M309.

28

Nine Years Experience Of Heart Transplantation in Ege University

Cagatay Engin, Tahir Yagdi, Sanem Nalbantgil, Mehdi Zoghi, Deniz Nart, Cagri Buke, Sultan Karakula, Isa Durmaz, Mustafa Ozbaran. Ege University Hospital, Department of Cardiovascular Surgery, Izmir, Turkey

Objective: Heart transplantation is a widely accepted method for the treatment of end-stage heart failure. We analyzed results of the heart transplantation at our university. **Patients and Methods:** Since 1998, 92 orthotopic heart transplantations have been performed in our department. All patients (mean age 41.7 years, 12–65 years) were operated using the biatrial cuff technique. **Results:** The hospital mortality was 11.9% and the overall mortality was 33.6%. Pulmonary hypertension was found to be related to the hospital mortality ($p:0.040$). Initially after transplantation right heart failure, acute rejection, unspecific graft failure and infections are a threat; while complications such as chronic graft sclerosis, renal failure and cancer are complications that appear over time. **Conclusion:** Although transplantation is the best treatment method of end-stage heart failure in selected patients, many patients are disposed to various severe complications. To optimize results, life-long regular follow up is necessary.

29

Short Term Left Ventricular Support With Impella Lp 5.0 Microaxial Pump: Our First Experience in The University Hospital of Geneva

Cikirikcioglu M, Panos A, Kalangos A. Department of Cardiovascular Surgery, University Hospital Of Geneva, Switzerland

Background and Aim: Postcardiotomy cardiac failure may complicate high risk cardiac surgery patients. At least 1% of them may require mechanical circulatory support beyond the high-dose of inotropic drugs and intra-aortic balloon pump support. We report our first and successful application of a new microaxial flow pump (Impella LP 5.0 system) in our department for the treatment of a postcardiotomy cardiogenic shock. **Case Report:** A 39-year-old man underwent a biological mitral valve replacement for bacterial endocarditis. He was

admitted 6 months later because of mitral valve paravalvular leak. Left ventricular ejection fraction was estimated at 30% by echocardiography. After CPB was installed, the heart was entered through a right atriotomy and septotomy. The origin of the paravalvular leak was observed between the middle of the posterior annulus and the place of the anterior commissure. It was fixed by six everted, 2/0 braided sutures with pledgets. The patient was weaned from cardiopulmonary bypass under high dose of inotropic support and intra-aortic balloon pump because of deteriorated left ventricular function. Despite the inotropic and intra-aortic balloon pump support, the hemodynamic values and end-organ functions continued to deteriorate at the first postoperative day (cardiac index was 1.5 L/min/m²). Because post cardiogenic shocks may greatly improve in the days after the surgery we decided to implant to our patient a “lighter” type of left ventricle assist device as a bridge to “the next decision”. The patient was transferred to the operating room and the Impella LP 5.0 microaxial pump was implanted under echocardiographic guidance through a right femoral artery cut down and over a stiff guide-wire. The implantation was easy and fast. Cardiac index was measured at 4.0 L/min/m² after the implantation. Twelve hours later, the pump failed because of an increased internal resistance secondary to the occlusion of the internal channel for lubrication. The axial pump was changed by the same femoral incision and a new one was inserted using the same technique. After five days of efficacious left ventricular support, we decided to explant the device. The hemodynamic values and end-organ functions were recovering and the sternum was closed on the 10th postoperative day. The left ventricular function was moderately recovered compared to the preoperative results. The patient left the hospital on the 25th postoperative day. **Discussion:** The Impella LP 5.0 microaxial pump (Abiomed Company, Aachen, Germany) is an intravascular microaxial blood pump intended to provide short-term mechanical support for acutely reduced left ventricular function named as bridge to next decision. This new device has an axial pump which is located at the tip of the catheter shaped device. The pump aspirates the blood from the left ventricle and ejects it directly into the ascending aorta. Supports with this pump may last up to 7–10 days. Besides the insertion through the femoral artery (as in our patient), the implantation can be done also through a Dacron graft anastomosed on the ascending aorta and left out of the thorax. The Impella microaxial blood pump is intended to support patients with postcardiotomy failure or cardiogenic

shock when we think a recovery may be obtained in short times or in cases where we need time to assess if the patient is eligible for the implantation of a heavier assist device. In conclusion we found that the Impella is an effective support, operator friendly, and less invasive device. However, the very limited length between the inflow and outflow points may create unwanted dislodgement of the pump during the movements or during the care of the patient.

Poster Presentations

30

In Vitro Investigation Of Two Different Chitosan Forms On Fibroblastic Cell Activity

Bahar Uslu¹, Serap Arbak¹, Suna Özbaş-Turan², Burcu Biltekin³, Seçnur Denir³, Jülide Akbuğa², Ayhan Bilir³

¹Departments of Histology and Embryology of Marmara University Faculty of Medicine,

²Department of Pharmaceutical Biotechnology of Marmara University Faculty of Pharmacy, and İstanbul University, İstanbul Faculty of Medicine, Turkey

Introduction: Chitosan is a kind of polysaccharide. It has been recently utilized in biomedical applications and especially in tissue culture. Cell culture studies demonstrated its effect on cellular growth and its stimulatory action on cellular layer formation. Our present in vitro study aims to compare the proliferative effects of chitosan in membranous and solution form on NIH 3T3 mouse fibroblasts. **Material and Methods:** This study contains three different groups: cells were cultured in a DMEM medium without chitosan (control group); cells were cultured either in a medium containing 2% chitosan in membrane form or 100 µl of chitosan solution. At 5th and 10th days of the experiment, cells were treated with 5-bromo-2-deoxyuridine (BrdU) and then incubated with anti-BrdU primary antibody to assess cellular proliferation. MTT [3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide] colorimetric assay was used for viability assessment. For each group, spheroid cell cultures grown in the above-mentioned media were investigated at transmission and scanning electron microscopy level to observe the cellular behavior. **Results and Conclusion:** BrdU labeling tests and MTT colorimetric assay indicated a higher proliferation index in membrane group at 10th and 5th day both. Transmission and scanning electron microscopy investigation of the spheroid cell culture represented well-defined cellular projections. Those

microscopy findings were significant in membrane group at 10th day. We can conclude that chitosan in membranous form at both 5th day 10th day of the experiment performed a significant proliferative effect on NIH 3T3 mouse fibroblasts in vitro conditions.

31

The Yeditepe University Organ Transplant Program

Özcan Gökçe, Alp Demirağ, Ülkem Yakupoğlu, Murat Kalayci, Baki Ekci, Tuba Gülçelik, Tülin Kesim.

Yeditepe Univ. Hospitals General Surgery & Transplantation, Istanbul, Turkey

The Yeditepe University Organ Transplant Center was established in October 2006. The clinical transplant program at the Yeditepe University Hospital includes renal, hepatic, pancreatic-renal and hepatic-renal transplantation and is supervised by experienced transplant surgeons, transplant physicians, organ transplant coordinator and one laboratory team. Currently the only criteria we use for recipient selection of kidneys, apart from ABO blood group matching and a negative anti-T-cell crossmatch, are good HLA match and transplant wait-list seniority. The ABO blood group matching and crossmatch negativity are two important factors that we consider during selection of liver transplant recipients. Since the beginning of the program, six kidney transplantations (one living-related and five cadavers) and one cadaver liver transplantation have been performed at our center. A quadruple sequential immunosuppressive treatment was used, including basiliximab (simulect) as an induction therapy and prednisolone, cellcept and FK506 as maintenance therapy. All kidney transplant patients have excellent kidney function with mean creatinine 1.2 m/dl. The liver transplant patient one month out of surgery has a good liver function. We maintain a laboratory for HLA testing and immunological monitoring in accordance with international standards, have a computerized network database to collect and store patient information, provide individualized treatment, direct postoperative care and healing and insist upon long-term patient tracking and clinical follow-up. We feel it is also critically important that transplantation and follow-up care be carried out by an integrated and experienced surgical and medical team.

32

Hepatitis C Virus Infection Impairs Health-Related Quality Of Life In Hemodialysis

Baris Afsar¹, Rengin Elsurer¹, Zubeyde Arat¹, Siren Sezer¹, Bulent Huddam¹, F. Nurhan Ozdemir¹ and Mehmet Haberal²

¹Department of Nephrology, Baskent University Hospital, Ankara, Turkey and ²Department of General Surgery, Baskent University Hospital, Ankara, Turkey

Introduction and Aims: Health-related quality of life (HRQOL) is impaired in hemodialysis (HD) patients. Hepatitis C virus (HCV) infection has negative impact on HRQOL in patients with normal renal function. However, HRQOL of HCV positive and negative HD patients was not compared specifically. We compared HRQOL of HCV positive and negative HD patients by using Short Form 36 (SF-36). **Methods:** Patients performed SF-36 and Beck Depression Inventory (BDI). Hemodialysis dose was evaluated by single-pool Kt/V (spKt/V). Previous transplantation history, economical, marital and educational statuses, presence of coronary artery disease, diabetes and sleep disturbance was noted and laboratory parameters were recorded. **Results:** In total 173 patients (male/female: 112/61, age: 49.9 ± 14.2 years, HD duration: 107.1 ± 67.1 months) were included. Eighty-four were HCV positive, 89 were HCV negative. Hemodialysis duration (141.5 ± 68.9 months vs. 75.4 ± 47.0 months, $p < 0.0001$), BDI scores (23.1 ± 8.9 vs. 20.3 ± 10.1, $p = 0.036$), aspartate aminotransferase, (19.7 ± 15.0 U/L vs. 14.2 ± 7.1 U/L, $p = 0.002$), alanine aminotransferase, (23.6 ± 24.0 U/L vs. 14.3 ± 10.8 U/L, $p < 0.0001$) were higher, low density lipoprotein cholesterol (87.6 ± 31.9 mg/dl vs. 101.3 ± 34.0 mg/dL, $p = 0.007$) was lower in HCV positive patients when compared to HCV negative patients. Other biochemical parameters were not different between HCV positive and HCV negative patients. After adjusting for age, HD duration, spKt/V, BDI scores, transplantation history, economical, marital and educational statuses, coronary artery disease, diabetes and sleep disturbances, the results of HRQOL showed that HCV positive patients had worse scores in four subscales of SF-36 namely: general health (36.9 ± 2.1 vs. 44.6 ± 2.0, $p = 0.016$), physical functioning (51.4 ± 3.2 vs. 64.3 ± 3.0, $p = 0.007$), physical role (34.6 ± 5.5 vs. 51.8 ± 5.2, $p = 0.036$) and vitality (38.8 ± 2.4 vs. 48.2 ± 2.3, $p = 0.011$) when compared to HCV negative patients. **Conclusions:** HCV positive hemodialysis patients tended to have higher depression scores than HCV negative patients. HCV infection seemed to have a

negative effect on the health related quality of life in hemodialysis patients independently.

33

Association Of Nutritional Status With Depression And Sleep Disorders In Elderly End Stage Renal Disease Patients

Avsin Ibis, Ayse Bilgic, Serkan Koc, Siren Sezer, Zubeyde Arat, F. Nurhan Ozdemir
Baskent University Faculty of Medicine,
Department of Nephrology, Ankara, Turkey

Malnutrition is common in dialysis patients with a strong correlation to inflammation and arteriosclerosis being a part of complex disorders. It is associated with increased morbidity and mortality in ESRD patients. There is evidence that malnutrition is more frequent in elderly than in younger patients with ESRD. The etiology of malnutrition in elderly ESRD patients is complex and may include multiple factors that may predispose to morbidity and mortality. There isn't enough data about the relation of sleep quality and depression with malnutrition in elderly dialysis patients. We aimed to determine the association between nutritional status and psychological factors such as depression and sleep disturbance in elderly dialysis patients. Seventy-three dialysis patients (41 female, 32 male; aged 72.5 ± 6.0) older than 65 years of age, 51 in hemodialysis (HD) and 22 in peritoneal dialysis (PD) program were enrolled in the study. Nutritional status was determined by Subjective Global Assessment (SGA). Beck Depression Inventory (BDI) questionnaire was used to measure presence and degree of depression. Quality of sleep was measured using the Pittsburgh Sleep Quality Index (PSQI). Demographic and biochemical factors of all patients were recorded retrospectively during one-year period for six months interval. According to SGA 48 (65.8%) patients were well nourished and 25 (34.2%) were malnourished. When the well-nourished and malnourished patients were compared, well-nourished group had higher albumin levels at 1, 6 and 12 months 4.27 ± 0.30 vs. 3.8 ± 0.46, 4.26 ± 0.46 vs. 3.76 ± 0.49 and 4.28 ± 0.25 vs. 3.50 ± 0.36; lower CRP levels at 12 months 7.51 ± 4.23 vs. 16.02 ± 19.45; better quality of sleep 3.50 ± 0.82 vs. 5.56 ± 1.73 and better depression scores 8.68 ± 2.75 vs. 16.28 ± 4.56 than malnourished group. When factors affecting nutritional status were taken into account BDI ($p = 0.001$; OR = 1.79; CI, 1.26–2.56) and PSQI ($p = 0.022$; OR = 4.33; CI, 1.23–15.2) were associated with SGA. Age, gender, dialysis modality, dialysis duration, comorbidities, frequency of infection and hospitalization in one-year period and CRP were not

associated with malnutrition. As a result malnourished patients were more prone to depression and sleep disorders than the well-nourished group. In conclusion, sleep disorders and depression are important factors affecting the malnutrition in elderly ESRD patients and they should be examined carefully to identify depression and sleep disturbance because many of them are reversible.

34

The Prospective Effect of Psychosocial Factors on Peritonitis and Hospitalization Rates in Peritoneal Dialysis Patients

Ayşe Bilgiç¹, Siren Sezer¹, Serkan Koc¹, Ruya Zelsançak¹, Zubeyde Arat¹, F. Nurhan Özdemir¹, Mehmet Haberal²

¹Baskent University Faculty of Medicine, Department of Nephrology and ²General Surgery, Ankara, Turkey

Psychosocial factors influence morbidity and mortality in chronically ill patients. Depression and sleep disturbances are widely acknowledged psychosocial factors seen in patients with chronic kidney disease (CKD). Quality of life is increasingly well recognized as an important measure of treatment outcome. This prospective study is designed to examine the relationship between psychosocial factors and peritonitis-hospitalization rates in continuous ambulatory peritoneal dialysis (CAPD) patients. Sixty patients (mean age, 45.6 ± 15.8 yr; M/F, 33/27; mean CAPD duration, 41.8 ± 17.6 months) maintained CAPD treatment in our unit were evaluated with Beck Depression Inventory (BDI), Pittsburg Sleep Quality Index (PSQI) and Medical Outcomes Study 36-item Short Form (SF-36). Baseline data also included demographic (age, gender, duration of CAPD), clinical (blood pressures, etiology of CKD, body mass index, comorbidity) and laboratory (hemoglobin, creatinine, calcium, phosphorus, albumin, C-reactive protein, parathyroid hormone, ferritin) results. Peritonitis and hospitalization rates were followed prospectively for 12 months after psychosocial assessment. Of the 60 patients, 14 (23.7%) patients had at least one peritonitis episode and 31 (52.5%) patients hospitalized at least once during follow-up period. During the study period patients with at least one episode of peritonitis compared to those with no episode of peritonitis had significantly worse sleep (7.2 ± 2.4 vs. 5.0 ± 3.2 , $P = 0.01$) and life quality scores (39.5 ± 9.7 vs. 47.7 ± 10.9 , $P = 0.01$). Patients hospitalized at least once had significantly higher depression scores (15.9 ± 7.0 vs. 9.6 ± 5.4 , $P < 0.001$), worse sleep quality (6.8 ± 2.1 vs. 4.2 ± 2.2 ,

$P < 0.001$) and life quality (42.1 ± 10.7 vs. 50.3 ± 10.3 , $P = 0.004$) scores than patients never hospitalized in 12 months follow-up period. Increased hospitalization frequency and days correlated with depression ($r: 0.350$, $P = 0.007$) and poor sleep quality ($r: 0.516$, $P = 0.0001$). Poor psychosocial factors are related with higher peritonitis and hospitalization rates. Whether frequent evaluation and improvement of depression, sleep, and life quality can reduce peritonitis and hospitalization rates needs to be determined with further investigations.

35

Evaluation of the Outcomes of the Patients Treated with Renal Replacement Therapies in Our Center

Y. Tala, E. Lafcioglu, C. Mirza, V. Şenkal, Nilgün Silay, Ü. Yakupoğlu
Yeditepe University Hospital, Division of Nephrology and Dialysis, İstanbul, Turkey

Introduction: Currently, improvements in renal replacement therapies (RRT) make it possible to treat the hospitalized patients with both acute and chronic renal failure and patients with concomitant multiorgan failure. Although our center is new, the number of critically ill patients followed is increasing; so the aim of this study is to investigate the types and outcomes of renal replacement modalities performed in our center, retrospectively. **Methods:** During a 12 month period, between April 2006 and April 2007 313 sessions of RRT were performed for 57 patients (ages ranging from 19 to 84). Clinical features of the patients and the modalities of RRT were investigated. **Results:** Thirty-nine out of 57 patients were diagnosed as acute renal failure (ARF) in the concept of multiorgan failure; 26 were considered as new while 13 were acute or chronic. The remaining 18 patients had chronic renal failure (CRF) and were on a regular hemodialysis program and hospitalized for cardiovascular and neurological disorders. The types of the RRT modalities were as follows: 221 sessions of continuous renal replacement therapy (CRRT); 79 sessions of intermittent hemodialysis therapy (IHD); 13 sessions of slow continuous ultrafiltration (SCUF) therapy. Four out of 26 patients with ARF died because of sepsis, RRT requirement disappeared in 20, and 2 patients progressed to CRF. No complications were observed in 13 patients with CRF and on regular hemodialysis. **Conclusion:** Our findings suggest that appropriate RRT choice for the patients who have hemodynamic instability and require life support will have a positive impact on the clinical outcome.

36

Overview of iPTH Levels According Changes in Universal Targets: 10 Years' Experience

Siren Sezer, Nurhan Ozdemir, Demet Yavuz, Müjdat Batur Canoz, Alpaslan Altunoglu, Mehmet Haberal

Baskent University Faculty of Medicine, Department of Nephrology, Ankara, Turkey

Background: Secondary hyperparathyroidism (SHPT), is a common complication of chronic kidney disease and has gained much attention in patient follow-up. In the last decade, significant variations in therapy choices and targets have taken place that can effect the distribution of hyperparathyroidism. Thus, in the present study, we aimed to evaluate the renal markers of osteodystrophy and prevalence of hyperparathyroidism in our patients during the last decade and to discuss the effectiveness of these protocols on SHPT target values. **Methods:** We collected the clinical and laboratory data of patients under hemodialysis treatment in years 1996, 2000 and 2006. The cross-sectional data of 132 patients in the year 1996, 92 in 2000 and 275 in 2006 were included. Additionally 52 patients whose longitudinal data were available were excluded and separately analyzed. There has been an increase in target of iPTH values that vitamin D therapy was initiated as 100 pg/mL in 1996, 150 pg/mL in 2000 while it was 250 pg/mL in 2006. Oral calcitriol (80% of patients) was used in 1996, oral and intravenous calcitriol (40% and 30%) in years 2000, majority of patients were under IV calcitriol therapy in 2006 (50% and 32%). Calcium carbonate and aluminum hydroxide (90% and 10%, respectively) were administered as major phosphorus binders in 1996, whereas calcium carbonate, calcium acetate and aluminum hydroxide (60%, 35% and 5%) were used in 2000 and calcium carbonate, calcium acetate aluminum hydroxide and sevelamer (30%, 50%, 2% and 18%, respectively) were used in 2006. **Results:** In 1996, the most frequent etiology for chronic renal failure was detected as glomerulonephritis and interstitial nephritis; while in 2006, these causes were replaced with diabetes and atherosclerosis. When cross-sectional data of patients were analyzed there has been an increase in the mean age and iPTH levels of patients under HD treatment through years 1996 to 2000 and 2006 [age: 44.1 ± 15.6 , 43.8 ± 13.1 , 50.4 ± 16.5 years, respectively ($P = 0.0001$). IPTH: 286.0 ± 379.9 median: 167; 196.9 ± 169.3 median: 137; 429.9 ± 503.6 median: 250 pg/mL respectively ($P = 0.0001$)]. The mean calcium and phosphorus levels did not statistically differ in patient groups (Ca: 8.87 ± 1.23 , 8.79 ± 0.74 ,

8.93 ± 1.22 mg/dL, respectively. P: 5.0 ± 1.37 , 5.04 ± 1.23 , 5.6 ± 1.23 mg/dL, respectively). When the data of 52 patients were considered a significant increase in Ca, P and PTH levels was observed ($P = 0.06$, $P = 0.011$, $P = 0.0001$). **Conclusion:** Hyperparathyroidism has become an emerging problem in HD patient population. Variable targets of PTH level for the treatment of renal osteodystrophy revealed controversial outcomes and hyperparathyroidism is still an important morbidity and mortality risk factor among HD population.

37

Clinical Outcome and Biocompatibility of Leukocyte Filtration on Polyethylene Oxide Based Heparin Bonded Circuits in High Risk Patients

Dilek Kilic, Serdar Gunaydin, Ucler Kisa, Tamer Sari, Ozcan Devenci, Yaman Zorlutuna University of Kirikkale & Bayindir Hospital, Turkey

Background: Relative benefits of continuous leukofiltration on polyethylene oxide (PEO) based heparin bonded extracorporeal circuits (ECC) were studied in EuroSCORE 6+ (high risk) patients. **Patients & Methods:** Over a 10-month period, 40 patients (EuroSCORE 6+) undergoing coronary revascularization were prospectively randomized to one of the four perfusion protocols: Group 1: PEO based heparin bonded ECC (Trillium Affinity, Medtronic, MN, USA) + Continuous Leukocyte filtration (LG6B and BC2 filters, Pall, NY, USA) (N = 10); Group 2: Uncoated ECC (Affinity, Medtronic, MN, USA) + leukofiltration (N = 10); Group 3: PEO based heparin bonded ECC without leukofiltration (N = 10); and Group 4: Control: Uncoated circuits without leukofiltration (N = 10). Blood samples were collected at T1: Following induction of anesthesia; T2: Following heparin administration; T3: 15 min after CPB; T4: Before cessation of CPB; T5: 15 min after protamine reversal and T6: ICU. Complete blood count, leukocytes and fibrinogen levels were evaluated. Serum albumin fractions, C3a, IL-1, IL-10, TNF-alpha and procalcitonine levels were documented. Hematologic outcome was evaluated by thromboelastography. CD11b/CD18 expressions were determined by flow cytometry. Blood cell adhesion on fibers was analyzed by optical microscopy and scanning electron microscopy. Desorbed protein amount on circuits (DPA) was evaluated by spectrophotometer. Extracorporeal circuits were placed in tissue culture, attached cells were counted. Perioperative follow-up was thoroughly monitored.

* <i>p</i> < 0.05 vs. control	GROUP 1	GROUP 2	GROUP 3	CONTROL
CD11b/CD18 (% Change) * Only statistically significant parameters are expressed	T4: 19.2 ± 4 T5: 16.8 ± 4	T3: 33.3 ± 4	T3: 28.5 ± 4 T4: 17.7 ± 4 T5: 18.4 ± 4	T3: 44.3 ± 7 T4: 36.7 ± 6 T5: 31.3 ± 6
Platelet Count (10 ³ /mm ³) * Only statistically significant parameters are expressed	T5: 156 ± 50		T4: 170 ± 50 T5: 163 ± 50	T4: 140 ± 50 T5: 125 ± 5
CKMB levels (ng/ml)	4.5 ± 1*	6.3	5.4 ± 1*	7.1 ± 1.5
Postoperative Atrial Fibrillation (%)	13 (2 pts)*	13 (2 pts)*	20 (3 pts)*	40 (6 pts)
Postoperative hemorrhage (ml)	620 ± 50*	755 ± 50	635 ± 50*	824 ± 50
Respiratory support (h)	8.1 ± 2*	8.9 ± 2*	7.4 ± 2*	12.9 ± 2
DPA (mg/dl)	1.9 ± 0.01*	3.2 ± 0.01	1.7 ± 0.01*	2.6 ± 0.01
Cell Culture (cell/mm ²)	55000 ± 70*	77000 ± 80	40000 ± 65*	75000 ± 80

Conclusion: Leukocyte filtration and PEO based heparin coating ameliorate SIRS and postoperative arrhythmia compared to control in high risk patients. Leukofiltration in addition to heparin bonding did not contribute to clinical outcome significantly with respect to coating alone.

38

Acute Disseminated Encephalomyelitis in a Child and Partial Response to Plasmapheresis

İdil Yenicesu, Günter Dilsiz, Aysima Aktürk and Ayşe Serdaroğlu

Gazi University Medical Faculty, Blood Bank, Pediatric Neurology, Ankara, Turkey

Acute disseminated encephalomyelitis is usually a monophasic inflammatory demyelinating disease process that affects the brain and spinal cord and typically occurs after a febrile (often presumed to be

viral) prodrome or vaccination. The typical presentation is that of multifocal neurologic disturbance accompanied by change in mental status. MRI is regarded as the diagnostic imaging modality of choice and typically demonstrates involvement of deep cerebral hemispheric and subcortical white matter as well as lesions in basal ganglia, gray-white junction, diencephalons, brainstem, cerebellum and spinal cord. Treatment with corticosteroids is considered to hasten recovery and is accepted as the mainstay of therapy. Intravenous immunoglobulin (IVIG) has been reserved for patients who do not respond to corticosteroids. Use of plasmapheresis to treat this condition is limited to case reports. The objective of this report was to describe our experience with a patient with a diagnosis of ADEM and the partial response to plasmapheresis in this patient.