The Cambodian Journal of Nephrology

Meeting Issue
The Cambodian and International Seminar for Nephrology and Dialysis 2015
Toru Hyodo, Congress President

JAC-DSC
Welcome Letters

Welcome Message to Attendees of “The Cambodian and International Seminar for Nephrology and Dialysis 2015”
Toru Hyodo, Hideki Kawanishi, Sovandy Chan, Tomotaka Naramura, Susumu Takahashi, Masafumi Fukagawa

The Cambodian and International Seminar for Nephrology and Dialysis 2015 Preliminary Program

Abstracts

Where a manuscript is posted in the Journal in multiple languages and where there is any discrepancy between the versions in different languages, the English language version will prevail over the others.
It is my great pleasure to organize the Cambodian and International Seminar for Nephrology and Dialysis in Phnom Penh. This seminar is open for the persons including doctors, medical students, nurses, nursing students and staffs who are related not only to nephrology and dialysis therapy but also medical fields in Cambodia.

I have the good news for such persons at this time. I belong to the committee of Japanese Society for Dialysis Therapy (JSDT) to support dialysis staffs in the developing countries. Cambodia is selected as the country that JSDT will support. The content of this support is to invite to the dialysis centers for 7 days in Japan. JSDT will support 100,000 yen per a person for this staying in Japan. The travel fee from Cambodia to Japan must be prepared by him or herself. The selection of the candidate for this program will be performed by the recommendation from the dialysis or nephrology related association, the hospital or the university that the candidate attends to. This committee of JSDT welcomes not only doctors but also the co-medical staffs as nurses and other professions. Maybe I think that 2 or 3 persons will be invited to Japan per a year from Cambodia.

The medical instruments and machines are very sophisticated and complicated. These devices are too difficult to operate only by doctors and nurses. The clinical engineer is the profession to operate such complicated devices and take care patients. The department of clinical engineering is common in every hospital and clinic in Japan. There are many universities that have the clinical engineering course as the faculty in Japan. The medicine cannot go take care patients. The department of clinical engineering is common in every hospital and clinic in Japan. There operate only by doctors and nurses. The clinical engineer is the profession to operate such complicated devices and take care patients. The number of patients being treated for ESRD globally was estimated to be 3,200,000 at the end of 2013 and, with a 6% growth rate, continues to increase at a significantly higher rate than the world population. In particular, the remarkable increasing rate was shown in Asian countries. However, the access to treatment is still limited in many developing countries and a number of patients with terminal renal failure do not receive treatment. In order to save these patients, it is necessary to enhance the dialysis system, the educated staff and association of each countries. Japanese Assistance Council of Establishing Dialysis Specialist System in Cambodia (JAC-DSC) was started the education programs of “Dialysis, Renal Transplantation, Clinical Engineering, and Diet Therapy for DM and CKD”.

We will expect to be built the cooperation between JAC-DSC and Cambodian Nephrology Team.

Toru Hyodo, M.D., Ph.D.
Director, Clinic, Higashiku, Japan / Senior Advisor Professor, Department of Urology, Keio University, Sagamihara, Japan
Congress President of the Japanese Society for Hemodi & Therapy (2013) / Council Member, Japanese Society for Dialysis Therapy (JSDT) Council Member, Japanese Society for Hemodi & Therapy / Council Member, Japanese Society for Perinatal Dialysis Council Member, Japanese Society for Dialysis Access / Council Member, Japanese Society for Clinical Nutrition, Vice Chairman of JSDT Committee to Support Young Doctors and Developmental Staffs in Dialysis Fields in Developing Countries Secretary General, NGO Ubiquitous Blood Purification International, Yokohama, Japan / Guest Professor, International University, Phnom Penh, Cambodia

Dear Participants,

Congratulation for the second seminar in International University. This seminar will be informed the important message for ESRD field in Cambodia and South Asia countries.

Hideki Kawanishi, M.D., Ph.D.
Director of kidney center and surgery, Tsuchiya General Hospital
Clinical professor of Faculty of Medicine, Hiroshima University, Hiroshima Japan
It is my great pleasure to organize the Cambodian and International Seminar for Nephrology and Dialysis at International University (IU) Hall in Phnom Penh. This seminar is organized with Japanese Assistance Council of establishing Dialysis Specialists system in Cambodia (JAC-DSC), Japan Association for Clinical Engineers (JACE) and International Kidney Evaluation Association Japan (IKEAJ).

This seminar is open for the persons including doctors, medical students, nurses, nursing students and staffs who are related not only to nephrology and dialysis therapy but also all medical fields in Cambodia.

The two dialysis related papers from IU will be presented in this scientific meeting. One is the paper that was presented by two IU medical students in the 3rd Annual Meeting of Japanese Society for Renal Nutrition 2015. Cambodia-Japan Friendship Dialysis Center of Sen Sok International University Hospital was established in 2010. Our dialysis center is young, but we have accomplished not only daily clinical dialysis works but also the scientific and educational activities.

I hope this seminar will benefit medical professional workers, students and the citizens of Cambodia.
## The Cambodian and International Seminar for Nephrology and Dialysis 2015 Preliminary Program

**Date:** September 22, 2015  
**Venue:** International University (IU); No 89-95, St.1984-1911. Phnom Penh Thmey, Sen Sok, Phnom Penh, Cambodia

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-9:00</td>
<td>Registration</td>
</tr>
<tr>
<td>9:00-9:10</td>
<td>Opening Ceremony</td>
</tr>
<tr>
<td>9:10-10:10</td>
<td><strong>Cambodian and Japanese Oral Presentations</strong></td>
</tr>
<tr>
<td></td>
<td>1. Thin Pich Thida and Rith Susan (Medical Students, IU, Cambodia): Introduction to Maintenance Haemodialysis for a Poor Cambodian Patient: The Nutritional Status Under the Present Dialysis Condition</td>
</tr>
<tr>
<td></td>
<td>2. Dr. Sovandy Chan (IU, Cambodia): The Dialysate Purification and Introduction of High Flux Dialyzers in Cambodia</td>
</tr>
<tr>
<td></td>
<td>3. Prof. Toru Hyodo (Eijin Clinic &amp; Kitasato University, Japan): A Simple Method of Dietary Management for Glycemic Control in Diabetic Hemodialysis Patients: The Usefulness of Basic Carbohydrate Counting</td>
</tr>
<tr>
<td>10:10-10:35</td>
<td><strong>Japanese Assistance Council of establishing Dialysis Specialists system in Cambodia (JAC-DSC) Education Lecture 1</strong></td>
</tr>
<tr>
<td></td>
<td>Prof. Kenichi Kokubo: Principles and Methods of Hemodialysis (Kitasato University, Japan)</td>
</tr>
<tr>
<td>10:35-11:00</td>
<td><strong>Nipro Corporation Industrial Seminar</strong></td>
</tr>
<tr>
<td></td>
<td>Mr. Kaname Sadahiro (Nipro Corporation): Dialysis Machine &amp; Medical Devices of Nipro Corporation</td>
</tr>
<tr>
<td>11:00-11:15</td>
<td><strong>Break</strong></td>
</tr>
<tr>
<td>11:15-12:00</td>
<td><strong>Special Education Lecture</strong></td>
</tr>
<tr>
<td></td>
<td>Prof. Masafumi Fukagawa (Tokai University, Japan): Prevention and Management of Chronic Kidney Disease (CKD)</td>
</tr>
<tr>
<td>12:00-12:10</td>
<td><strong>Break</strong></td>
</tr>
<tr>
<td>12:10-13:00</td>
<td><strong>DKSH Cambodia (Roche) Luncheon Seminar</strong></td>
</tr>
<tr>
<td></td>
<td>Prof. Hideki Kawanishi (Tsuchiya General Hospital): Anemia Management for CKD</td>
</tr>
<tr>
<td>13:00-13:10</td>
<td><strong>Break</strong></td>
</tr>
<tr>
<td></td>
<td>Mr. Nobuo Ito (IKEAj, Japan): CKD Screening Program in Japan --- Activities of IKEAj ---</td>
</tr>
<tr>
<td>13:35-14:25</td>
<td><strong>Japan Association for Clinical Engineers Education Lectures</strong></td>
</tr>
<tr>
<td></td>
<td>Ms. Moe Kojima (Tokai University Oiso Hospital, Japan): The Role of Clinical Engineer as a Profession</td>
</tr>
<tr>
<td></td>
<td>Prof. Tomotaka Naramura (Junshin Gakuen University, Japan): Dialysis Fluid Purification</td>
</tr>
<tr>
<td>14:25-14:50</td>
<td><strong>JAC-DSC Education Lecture 2</strong></td>
</tr>
<tr>
<td></td>
<td>Dr. Kanenori Maeda (Maeda Clinic, Japan): Long-hour Hemodialysis</td>
</tr>
<tr>
<td>14:50-15:05</td>
<td><strong>Break</strong></td>
</tr>
<tr>
<td>15:05-15:30</td>
<td><strong>JAC-DSC Education Lecture 3</strong></td>
</tr>
<tr>
<td></td>
<td>Dr. Minoru Ito (Yabuki Hospital, Japan): The Nutritional Assessment of Dialysis Patients using a Malnutrition-Inflammation Score (MIS)</td>
</tr>
<tr>
<td>15:30-15:55</td>
<td><strong>JAC-DSC Education Lecture 4</strong></td>
</tr>
<tr>
<td></td>
<td>Prof. Toshihide Nagamura (Osaka City University Hospital, Japan): Vascular Access</td>
</tr>
<tr>
<td>15:55-16:00</td>
<td><strong>Closing Remarks</strong></td>
</tr>
<tr>
<td>16:00-16:30</td>
<td><strong>Delivery of Certifications to All Audience</strong></td>
</tr>
</tbody>
</table>
Abstracts

Introduction to Maintenance Hemodialysis for a Poor Cambodian Patient: The Nutritional Status Under the Present Dialysis Condition.

1) Thim Pich Thida MS, 2) Rith Susan MS, 2) Yim Sovannbophea MD, 2) Som Leakhena MD, 1, 2) Socody Chan MD, 2, 3) Haruki Wakai MD, 2, 3) Toshitide Nagasuna MD, 2, 3) Kenichi Kohobo PhD, 2, 3) Toru Hyodo MD, 2, 3) Kazunari Yoshiida MD, 2, 3) Hideki Kaucanishi MD, 2, 3) Yukie Kitajima RD, 3) Satoko Tamura RD, 1, 2) Sabo Ojano MD

1) School of Medicine, International University, Phnom Penh, Cambodia
2) Cambodia-Japan Friendship Blood Purification Center, Sen Sok International University Hospital (SSUIH), Phnom Penh, Cambodia
3) Japanese Assistance Council of establishing Dialysis Specialists system in Cambodia (JAC-DSC), Tokyo, Japan

[Background]
People living in Phnom Penh earn an average of $100-$250 a month for government salary, and the hemodialysis (HD) costs $45-60 per time in $100-$250 a month for government salary, and the hemodialysis (HD) costs $45-60 per time in Phnom Penh. Since the HD costs are unaffordable for the low-income patients. In this study, we are reporting the nutritional and psychological status of a poor female patient who has been receiving HD supported financially by her neighbors.

[Case]
A 56-year-old non-diabetic female patient was given a diagnosis of the end stage renal disease (ESRD) on November 22, 2014. A local physician suggested HD, but it was not performed because of the unaffordable cost. Owing to her neighbor’s financial donation, she was able to receive HD. At the end of December, approximately $1,500 has been donated. From November 29, 2014 to May 15, 2015, 26 times of dialysis were performed at SSUI Hospital. The interval between each dialysis was 4-7 days. The predialysis data on November 29, 2014 were: Creatinine 12.0 mg/dl, Blood urea 209 mg/dl, Hematocrit 28.7%, and Potassium 3.7 mmol/l. The predialysis data on May 15, 2015 were: Creatinine 10.1 mg/dl, Blood urea 118 mg/dl, Hematocrit 21.4%, Phosphorus 4.4 mmol/l, Albumin 4.3 g/dl, SGA (Subjective Global Assessment) B, and CESD-R (Center for Epidemiologic Studies Depression Scale Revised) 25/60. After receiving HD, her Blood Urea level decreases to 28 mg/dl. No erythropoietin was available due to the financial problems. Dialysis time was 4 hours from November 2014 until April 2015 but 6 hours long dialysis started from May 2015.

[Discussion]
Nutritional status was assessed using biochemical values and SGA questionnaires, and the psychological status CESD-R questionnaires; leading to the final conclusion, the patient is moderately malnourished and slightly depressed. No significant difference was detected for biochemical profiles with the exception of Hematocrit, while SGA and CESD-R results were unsatisfactory; Many studies have reported the enough dialysis dose is needed to keep good nutritional status. The 2 times 4 hours dialysis per a week is common in the Southeast Asian developing countries. In improving nutritional status, six-hour dialysis is thought to be more beneficial than four-hour dialysis. The improvement of depressive status needs the further observation for this case.

[Conclusion]
Hence, introduction of six-hour dialysis to developing countries is extremely crucial.
The Dialysate Purification and Introduction of High Flux Dialyzers in Cambodia

1) Sovandy Chan, 1) Yim Sovannbophea MD, 1) Som Leakhena MD, 2) Hirokazu Matsubara, 2) Moe Kojima CE, 1) Tomotaka Naramura CE, 1, 2) Haruki Wakai MD, 1, 2) Yoshitohde Naganuma MD, 1, 2) Kenichi Kokubo PhD, 1, 2) Fumitaka Nakajima MD, 1, 2) Kazunari Yoshida MD, 1, 2) Hideki Kawanishi MD, 1, 2) Sabo Ojano MD

[Abstract] Basic carbohydrate counting, a method used in the dietary management of diabetes, is based on the concept that the postprandial rise in blood glucose levels is primarily affected by ingested carbohydrates. In this method, patients are instructed to eat a consistent amount of carbohydrates across their three daily meals to minimize fluctuations in postprandial blood glucose levels. In the present study, 16 diabetic patients undergoing maintenance hemodialysis were instructed in basic carbohydrate counting and followed for 6 months to assess changes in their predialysis blood glucose, hemoglobin A1c, and other parameters. The patients who had learnt basic carbohydrate counting had a mean carbohydrate intake of 51.0 ± 4.7% of the total carbohydrate intake. The results demonstrated that basic carbohydrate counting is a useful method of dietary management for glycemic control that can be applied independently of, but concurrently with, the control of potassium and phosphorus intake in dietary therapy for dialysis patients.

A Simple Method of Dietary Management for Glycemic Control in Diabetic Hemodialysis Patients: The Usefulness of Basic Carbohydrate Counting

Tora Hyodo M.D., PhD
Dialysis Center, Eijin Clinic, Hiratsuka, Japan
Department of Urology, Kitasato University, Sagamihara, Japan

[Abstract] Basic carbohydrate counting, a method used in the dietary management of diabetes, is based on the concept that the postprandial rise in blood glucose levels is primarily affected by ingested carbohydrates. In this method, patients are instructed to eat a consistent amount of carbohydrates across their three daily meals to minimize fluctuations in postprandial blood glucose levels. In the present study, 16 diabetic patients undergoing maintenance hemodialysis were instructed in basic carbohydrate counting and followed for 6 months to assess changes in their predialysis blood glucose, hemoglobin A1c, and other parameters. The patients who had learnt basic carbohydrate counting had a mean carbohydrate intake of 51.0 ± 4.7% of the total carbohydrate intake. The results demonstrated that basic carbohydrate counting is a useful method of dietary management for glycemic control that can be applied independently of, but concurrently with, the control of potassium and phosphorus intake in dietary therapy for dialysis patients.
Hemodialysis is used to treat patients with end-stage renal failure and to substitute patient’s kidney functions. Extracorporeal circulation is carried out during hemodialysis therapy, which enables us to modify blood taken out from the body, i.e., to remove toxins from the blood and to correct electrolyte concentration and pH of the blood. Dialyzer is the main component of the hemodialysis therapy in which mass transfer between blood and dialysis fluid through the dialysis membrane occurs based on diffusion and filtration. During hemodialysis, uremic toxins accumulated in the blood are removed, and electrolyte concentration and pH are corrected. Dialysis efficiency depends on many factors. From an engineering point of view, important determinants of dialysis efficiency include operating conditions such as blood flow rate and dialysate flow rate, membrane area, and solute permeability of the dialysis membrane. It is important to know how operating conditions affect dialysis efficiency. To safely carry out dialysis therapy, the dialysis machine should be capable of controlling extracorporeal circulation, fluid removal rate, temperature, and dialysis fluid concentration; monitoring blood pressure in the circuit; and detecting bubbles in the blood circuit and blood leakage from the dialyzer.

Nevertheless, recent data suggested that mineral abnormalities develop and affect the progression of CKD and cardiovascular risk from the early phase of CKD without abnormal laboratory data. Mechanisms include the formation of calciotropic particles and the effects of increased FGF23. Accumulation of uremic toxins is another risk for CKD patients, which is not routinely tested. Uremic toxins cause oxidative stress in cells, and also promote DNA methylation in important genes.

### Prevention and Management of Chronic Kidney Disease (CKD)

Masaumi Fukagawa, MD, PhD
Professor of Medicine, Tokai University School of Medicine, Isehara, Japan

CKD is a globally popular disease. Because no subjective symptoms develop until the end stage, early screening and regular follow-up are extremely important processes for the recognition and appropriate management of the disease. Routine screening tests usually include dipstick and eGFR. Considering the cost effectiveness and local economical status, target populations should be determined carefully. AFCKDI has already published recommendations for early detection for Asian countries. During follow-up, further referral from primary care physician to nephrologists may be needed. In addition to specific therapies depending on the cause, supportive cares such as management of hypertension and hyperkalemia are mandatory.

### Nipro Corporation Industrial Seminar: Dialysis Machine & Medical Devices of Nipro Corporation

Kaname Sudaahiro (Mr.)
Nipro Corporation
General Manager
Products Sales And DevelopmentII

Nipro continues to develop and provide products and technologies required by people around the world, to fulfill their wishes to be healthy. In this seminar, We mainly introduce Nipro’s corporate profile and medical devices for dialysis treatment; two kinds of dialyzers (triacetate dialyzer and polyether-sulfone dialyzer,) arteriovenous fistula needle, Blood tubing set, and dialysis machine.

### Anemia Management for CKD

Hideki Kawanishi, MD,
Tsuchiya General Hospital / Faculty of Medicine, Hiroshima University, Hiroshima, Japan,
NGO Ubiquitous Blood Purification International, Japan

**Renal anemia**

In patients with chronic kidney disease, normochromic normocytic anemia mainly develops from decreased renal synthesis of erythropoietin. The anemia becomes more severe as the glomerular filtration rate (GFR) progressively decreases. No reticulocyte response occurs, red blood cell survival is decreased and there is an associated increased bleeding tendency due to uremic-induced platelet dysfunction. Renal anemia refers to anemia caused by decreased renal EPO-producing capacity due to renal disease. Other causes of renal anemia include shorter lifespan of red blood cells, hyporesponsiveness of erythroid progenitor cells to EPO, and residual blood in the dialysis blood circuit in hemodialysis (HD) patients.

**[ESA therapy]**

ESA therapy in patients undergoing HD in GL should target an Hb level of 10 to 11 g/dL at the beginning of the week. Hb levels exceeding 12 g/dL should be the criteria for dose reduction or interruption of ESAs. Moreover, Hb levels exceeding 13 g/dL should be the criteria for dose reduction or interruption of ESAs.

**[Conclusion]**

The time taken for ESA treatment to be effective will depend on individual patient factors, such as degree of anemia, degree of kidney disease and presence of other adverse factors - eg, iron deficiency.

### CKD Screening Program in Japan — Activities of IKEAJ —

Nobuo Ito and Susumu Tsuchi
International Kidney Evaluation Association Japan (IKEAJ)

IKEAJ which was founded in 2005 has performed three main activities; (1) international activity, (2) education and public relations activity and (3) health checkup activity. As the health checkup activity, IKEAJ started the Japanese version of Kidney Early Evaluation Program (KEEP JAPAN) in 2006, one of the charge-free detection programs for chronic kidney disease (CKD), following the National Kidney Foundation (NKF) in the United States. The characteristics of KEEP JAPAN are:

1. The participants are targeted to the population with history of diabetes or hypertension, or family history of diabetes, hypertension, or kidney disease.
2. Yearly follow-up examination is available for the participants.
3. Participants can be referred to nephrologists if they have CKD.

As of December 2014, more than 7,800 people participated in this program, cumulatively. The prevalence of CKD was as high as 25.2% among the patients of KEEP JAPAN, which was much higher than that among general population reported by other programs, and approximately 10% of participants with CKD were categorized in the very high risk for prognosis in KDIGO classification. The history of diabetes, history of hypertension, history of cardiovascular disease, older than 60 years of age, obesity, poor control of blood pressure were the significant risk factors.
The Role of Clinical Engineer as a Profession

Moe Kojima, C.E. 1), 2), 3) Tomotaka Naramura, C.E., Ph.D. 1), 2) Japan Association for Clinical Engineers 1) Tokai University Oiso Hospital 2) NGO Ubiquitous Blood Purification International 3)

In Japan, the Clinical Engineers Act for clinical engineers was established in 1987 because of the use of various medical equipment in the development of medical engineering. In recent years, a national license for clinical engineers was established, thus highlighting the importance of safety and efficiency.

Thirty years have passed since the establishment of the Clinical Engineers Act, and approximately 35,000 people have obtained the national license until now. It is specified by the law that “A clinical engineer can operate, maintain, and inspect life support equipment under the direction of a physician.” Life support equipment is intended to replace or assist some of the functions related to a person’s breathing, circulation, and metabolism. In general, it refers to a mechanical ventilator, anesthetic machine, heart-lung machine, or dialysis machine. Clinical engineers work in various fields, being active in many locations such as the dialysis room or operating room.

The best feature of clinical engineers in Japan is that they are able to administer medical care to patients. For example, in the blood purification treatment, a clinical engineer can be puncture to shunt vascular, monitor during treatment, and return blood to the patient. Clinical engineers perform not only maintenance of the equipment but also propose methods of dialysis fluid purification and new dialysis treatments by taking advantage of their highly specialized field. The significance of a clinical engineer in the current medical practice that requires a medical care team is greatly increasing. With the improvement of medical technology worldwide, I think that there will be a requirement of staff similar to Japan’s clinical engineers, with knowledge of medical and engineering fields in order to fulfill sophisticated and complicated needs.

I hope this presentation will help you to understand the professional role of a clinical engineer.

Dialysis Fluid Purification

Tomotaka Naramura, C.E., Ph.D. 1), 2) Moe Kojima, C.E. 1), 3) Japan Association for Clinical Engineers 1) Department of Medical Engineering, Faculty of Health Sciences, JUNSHIN GAKUEN UNIVERSITY 2) NGO Ubiquitous Blood Purification International 3)

Quality assurance in the purification of dialysis fluid is a vital component of dialysis treatments. The response from toll-like receptors to produce cytokines is a known result of dialysis fluid having been contaminated by bacterial endotoxins during dialysis treatment. Inflammation during hemodialysis treatment, which may be a result of contaminated dialysis fluid, has contributed to the rise in Malnutrition Inflammation Atherosclerosis (MIA) syndrome becoming problematic. For quality assurance of dialysis fluids, proper water management is vital. Both scheduled and random water quality testing needs to be managed alongside equipment maintenance, such as the endotoxin retentive filter (ERTF) and the daily requirements of the reverse osmotic (RO) distribution network for quality conformity.

The installation of an ETRF is easy and safe step in the purification of dialysis fluid. However, the existence of smaller endotoxins and fine structure of bacterial cell can pass through the ETRF, hence the need to systematically purify the network, with the RO distribution systems first. This presentation focuses on the importance of quality assurance and the problems faced in the production process of dialysis fluid, highlighted by the strategy of Cambodia dialysis facility.

Long-hour Hemodialysis

Kanenori Mueda, Yukik Mueda

The department of Urology and Nephrology, Mueda Clinic, Nagasaki, Japan.

[Background]
The hemodialysis medical care system evolves day by day, as symbolized by the improvements of hemodialysis equipment, of dialyzer’s quality, of dialysate purification, and of the biocompatibility of devices. Renal replacement therapy has accumulated a lot of experiences and treatments for a variety of complications, including drug therapies is certainly progress. The functions of the kidneys are “filtration”, “re-absorption” and “endocrine.” On the other hand, the functions of hemodialysis are “diffusion”, “convection” and “adsorption.” These very simple principles have not changed at all in 60 years to the present day from the early days of hemodialysis. Hemodialysis is not as adequate as the kidneys. Our normal kidneys work 24 hours a day. However, conventional hemodialysis is performed only 12 hours a week. At the present stage, insufficient hemodialysis care system (hemodialysis shortage) should not be accepted at least, since the upper limit of the hemodialysis dosage is not shown.

[Contents]
I will introduce data from DOPPS that is the Dialysis Outcomes and Practice Patterns Study from 11 countries and areas. DOPPS is a prospective cohort study of in-center hemodialysis patients. In this study, when treatment time was 30 minutes longer per one session, we recognized improvement in all-cause mortality, risk of any hospitalization, risk of cardiovascular hospitalization and the risk of hospitalization due to chronic heart failure or fluid overload. Additionally, I will show data from the Japanese Society for Dialysis Therapy Renal Data Registry (JRDR). A huge observational cross-sectional study from JRDR was conducted to determine the relationship between the treatment time and some objectives. In this study, as the treatment time becomes longer per one session, Kt / V urea, the control of serum phosphate levels and nPCR (normalized protein catabolic rate) are improving. As the treatment time becomes longer, the reduction rate of serum i2MG levels, the serum albumin levels and blood hemoglobin levels increases.

[Conclusion]
Long-hour hemodialysis is meaningful.

The Nutritional Assessment of Dialysis Patients using a Malnutrition-Inflammation Score (MIS)

1) Minoru Ito, 1) Hato Masakane, 2) Yumiko Seino
1) Dept. of Nephrology and Dialysis Center, 2) Dept. of Nutritional Care, Yabuk Hospital, Yamagata, Japan.

[Background and Purpose]
Most of the dialysis patients present signs of malnutrition at the initiation of dialysis therapy. Nutritional assessment of dialysis patients is very important because nutritional status of dialysis patient is correlated with their increased morbidity and mortality. Several factors, such as...
Abstracts

chronic inflammation, accumulation of ureic toxins, aging, dietary restriction, etc. could influence dialysis patients’ nutritional status. MIS is reported by Kalantar-Zadeh in 2001 as an assessment tool of malnutrition inflammation complex syndrome of dialysis patients. In this presentation, we report our usage experiments and the efficacy of MIS.

Methods
We analyzed the MIS data of 144 patients with hemodialysis (HD) therapy (male 89, female 55). A mean age was 64.7 ± 13.5 years. All patients were classified into three subgroups corresponding to each score, normal nutritional group (MIS 0-3), mildly impaired group (MIS 4-7), severely impaired group (MIS over 8) respectively. The survival rates were compared among the three groups using the Kaplan-Meier analysis. The prognostic factors were analyzed using the multivariable logistic regression analysis.

Results
Three year survival rates of the normal group, the mildly impaired group and severely impaired group were 100%, 91% and 68% respectively. We found a significant difference in the mortality between the severely impaired group and the other two groups with a Log-Rank test. The prognostic factors of HD patients were the total point of MIS and the patient’s age.

Discussion
MIS is a comprehensive and quantitative nutritional assessment tool and consists of 10 components (medical history, physical examination, body mass index and laboratory parameters, etc.). According to the scores of each component, we can design therapeutic intervention for patients with malnutrition. Interestingly, each component of MIS was not independent prognostic factor by itself. However the total point of MIS was a significant predictive index for prognosis. Comprehensive, multidirectional and multi-factorial assessment is very important. MIS is powerful tool for nutritional assessment of dialysis patients.

Vascular Access
Toshihide Naganuma 1,2)

1) Department of Urology, Osaka City University Graduate School of Medicine, Osaka, Japan
2) NGO Ubiquitous Blood Purification International, Japan

Vascular access (VA) is an essential component of dialysis treatment, and performing a successful VA procedure is critical for a favorable patient prognosis and quality of life. The most basic VA procedures are internal shunts (arteriovenous fistula; AVF), which have fewer complications and a patency rate higher than those of arteriovenous grafts (AVG) and catheters. In Asian patients who have less morbid obesity compared to European and American patients, AVF procedures are relatively easier to perform. We therefore should learn and master these procedures and be prepared for the various complications of AVF. In addition, these surgical techniques can be applied to AVG procedures. In this session, I will show you a video of the AVF procedure we use at our institution. I will also show you a video of the percutaneous transluminal angioplasty (PTA) procedure we use for the long-term patency of AVF which has increasingly become necessary in recent years.

The Cambodian Journal of Nephrology

Provisional Editors: Hideki Kawanishi Japan
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Author Guidelines

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