16th PDSI 2013 Abstracts – Poster And Oral Presentation Poster

POSTER

1h NMR Spectroscopy Metabolome Can Differentiate Bacterial And Fungal Peritonitis

Nitin Bajpai, Narayan Prasad; Dinesh Kumar; Amit Gupta; Raj Kumar Sharma ; Anupama Kaul; Dharmendra Singh Bhadauria
Department of Nephrology; Sanjay Gandhi Post Graduate Institute of Medical Sciences; Lucknow

Background: In recent times; the 1H nuclear magnetic resonance (NMR) spectroscopy has become one of the most important analytical tools for metabolic composition–i.e. the metabolome of body fluids or tissue extracts.

Aim Of The Study: Peritonitis continues to be potentially fatal complications which can lead to death or malfunctioning of peritoneal membrane.

Methods: To date; no NMR based study has been performed to look at the metabolic composition of PD effluent which contains the metabolites consumed from and secreted into the effluent from the tissue or cells (including the infection) in close proximity. We aimed to explore 1H NMR spectroscopy to study metabolome of PD fluid in patients with and without peritonitis and to explore the future use of this tool in diagnosis of peritonitis.

Results: The 1H NMR analysis of PD effluent (2.5 %) fluid from 20 PD patients suffering from peritonitis (15 from bacterial peritonitis and 5 from fungal peritonitis) and 10 control cases (i.e. PD patients without having peritonitis). Interestingly; a significant metabolic differences have been observed in these three groups suggesting that 1HNMR of PD effluent can be used to predict the complications associated with PD. An unambiguous distinction between fungal and bacterial peritonitis has been established as evident from the Figure. The presence of cyclopropane signal (near 0.6 ppm); observed for the all bacterial peritonitis cases studied while this peak and finger-print marker was not present in fungal peritonitis and normal PD effluent differentiating the bacterial peritonitis from the control and fungal peritonitis.

Conclusions: In summary; the work has highlighted inherent differences in the metabolic composition of PD effluent from ESRF patients on PD which has its great implication to rapidly identify patients at risk of developing peritonitis.

Correspondence: Narayan Prasad, Additional Professor Of Nephrology, SGPGIMS, Lucknow
Email: narayan@sgpgi.ac.in, arayan.nephro@gmail.com

Icodextrin Alone Exchanges Improves Cardiac Function And No Peritonitis In Continuous Ambulatory Peritoneal Dialysis Patients

Karunan K, Pratap V, Kader M. Departments of Nephrology, surgical gastroenterology, cardiology Government Medical college, Kozhikode

Abstract: Aim: Peritoneal dialysis with Icodextrin alone is gaining acceptance among ESRD patients. The advantage of increasing ultrafiltration and left ventricle function besides decreasing peritonitis is seen in this group of patients in our study. Reduced number of exchanges and no need for hospitalisation after initiation of PD was salient features.

Methods: Six patients opted for Icodextrin alone CAPD with surgical placement of catheter were randomly selected for the study. CAPD initiated immediately after catheterisation and patients were trained to do PD at home. PET and echocardiography was done at frequent intervals as per protocol.
Results: In the study groups significant improvement in left ventricular function (HR, CTI, EF; p =< 0.04), quality of life, residual renal function were observed. The cost of dialysis significantly reduced due to no further hospitalisation and peritonitis. This reduced the economical burden for both government and patient.

Key Words: CAPD, Ultrafiltration, residual renal function, left ventricular function, icodextrin.

Correspondence: Dr. Karunan kannampoyilil, Department of Nephrology, Govt. Medical college kozhikode, Kerala. 673008. Email: poyilil@gmail.com

16s Rrna Gene Sequencing For The Diagnosis Of CAPD Peritonitis

A.K. Mahapatra, Narayan Prasad; Kamini Singh; Amit Gupt; KN Prasad; RK Sharma
Department of Nephrology & Microbiology; SGPGIMS; Lucknow

Background: Peritonitis is the most common complication of continuous ambulatory peritoneal dialysis (CAPD); and the spectrum of organisms causing CAPD peritonitis is broad. Polymerase chain reaction (PCR) has recently emerged as powerful tool in diagnosis of infectious diseases. In the present study we used broad-range universal PCR along with 16S ribosomal RNA (rRNA) gene sequencing for detection and identification of bacterial pathogens.

Aim Of The Study: Total of 30 patients on CAPD with culture negative peritonitis were included in the study. Culture negative peritonitis was determined by the microbiological culture of fluid using Bactec 9120.

Methods: In all the culture negative samples Gram type specific PCR was performed followed by 16s rRNA sequencing; sequence were submitted in NCBI and accession number were allotted.

Results: All culture negative samples were positive for broad-range universal PCR which were further subjected to Gram specific PCR to differentiate between Gram positive and Gram negative. The result of Gram specific PCR were as follows; 18 (60%) samples were positive for Gram negative bacteria and 4 (13.3%) for Gram positive while remaining 8 (26.7%) were positive for both Gram positive and Gram negative bacteria.

Conclusions: 16S rRNA gene PCR complements culture methods in the diagnosis of CAPD peritonitis. It is a rapid and useful method for the detection of organisms in culture negative samples.

Correspondence: Narayan Prasad, Additional Professor Of Nephology, SGPGIMS, Lucknow
Email: narayan@sgpgi.ac.in; narayan.nephro@gmail.com

Successful Use Of Intra Catheter Streptokinase In The Treatment Of Recurrent / Resistant Peritoneal Dialysis (CAPD) Patients

Padmanabhan S, Anil Kumar BT and Manjunath S, Institute of Renal Sciences; BGS Global Hospitals; Bangalore; India

Background: Peritonitis is the most important complication of CAPD. Relapsing / recurrent peritonitis leads to catheter removal in most patients. Bacteria sequestrated in the biofilm on the inner surface of the catheter are the cause of relapsing infections. Thrombolytic agents like streptokinase (STK) and Urokinase help to dissolve the biofilm and enable exposure of
bacteria to the antibiotics.

**Aim Of The Study:** We describe two cases of recurrent peritonitis in which intra catheter STK and appropriate antibiotics helped in eradication of the infection.

**Methods:** Intracatheter STK was given for two patients with recurrent / resistant peritonitis. Standard definition of peritonitis was used. CAPD effluent was sent for cell count; differential count; Grams stain and culture. As cultures were negative we sent the effluent for DNA chip array analysis to identify the organism. Exit site and tunnel infection was ruled out. 750000 units of STK was dissolved in 10 ml of normal saline and was instilled into the catheter at the end of pd fluid fill in. It was left in the lumen for 4 hours before the next exchange. Appropriate antibiotic therapy was continued. Success was defined as freedom from peritonitis for one month after the antibiotic course was completed.

**Results:** We had two patients with recurrent episodes of peritonitis who underwent the procedure. One of the two had diabetes. The mean duration of CAPD in them was 56 months. This was the first ever episode of peritonitis for both of them which unfortunately turned out to be recurrent/ resistant. They had three episodes of peritonitis in two months when the decision to give intracatheter STK was taken. Both of them had negative conventional cultures. CNS was identified by the DNA chip array in both the patients in the third and fourth episodes. Oral Linezolid was given for two weeks for both of them. Peritonitis resolved after STK infusion for them. No complication was noted in both. They are free from peritonitis for over 6 months now.

**Conclusions:** Intracatheter streptokinase infusion is effective in the treatment of recurrent/relapsing/resistant peritonitis in CAPD patients. It is safe; cost effective and can be performed as an outpatient procedure. Successful procedure averts the need for Tenckhoff catheter removal.

**Correspondence:** Dr. S. Padmanabhan, Institute of Renal Sciences; BGS Global Hospitals, Bangalore 560034.
Email: padmanabhan_subr@yahoo.com

**Prevention Of Catheter Tip Migration**

B. Varalaxmi, P. Sandeep; K. Radhakrishna; U. Chakarpani; V. Venkata Rami Reddy; R. Ram; V. Siva Kumar. Nephrology and Surgical Gastroenterology, SVIMS; Tirupati

**Background:** With the Tenckhoff catheter; the recommendation is to create a subcutaneous catheter tunnel that is slightly arcuate giving a caudal direction to both the external and internal segments. The arcuate tunnel shape is preferred because it allowed an exit below the belt.

**Aim Of The Study:** Frequently the external cuff eroded out of the subcutaneous tunnel because of the "shape memory" of the straight catheter; gradually converting an arcuate tunnel into a straight one.

**Methods:** This conversion; along with the another force-the resilience of the catheter; leads to migration of tip of the catheter. The internal cuff acts like fulcrum on which the catheter tip moves into the upper abdomen. The swan neck catheter is designed to prevent the migration.

**Results:** The other catheters specifically designed to reduce the migration include a straight catheter; with perpendicular silicone discs[Toronto Western Hospital (TWH) or Oreopoulos–Zellerman catheter] and the self-locating catheter; designed by Di Paolo; with twelve grams of tungsten inserted in the tip of the conventional Tenckhoff catheter to
prevent the movement from pouch of Douglas. The discs in TWH catheter are designed to prevent omental wrapping and to keep the catheter placed low in the pelvis. The catheters with a coiled intraperitoneal segment have more intraperitoneal mass and may not migrate. In addition; a one-stitch fixation of the catheter to the peritoneum and posterior sheath to prevent catheter tip migration had also been advocated (6). The drawback of this procedure is when the removal of catheter is planned an elaborate surgery may be required. Another modification proposed is low site peritoneal catheter implantation. The catheter is inserted approximately 6 – 8 cm above the pubic symphysis instead of the conventional procedure of using umbilicus as the reference point. By the low-site implantation technique the catheter is much nearer and straighter to the pelvic cavity; thus preventing migration. The peritoneal catheter migration may occur between 12.7% and 35% of patients. The surgical revision of the catheter might be required in 90% of patients. Several non-surgical correction measures have been tried. At our institute; a swan neck catheter is regularly used for peritoneal dialysis. The catheter insertion is being done by a gastroenterology surgeon under the laparoscopy. The precaution is always taken to direct the exit site caudally. We present a modification in insertion technique which reduced the risk of migration of the catheter. After insertion of a 10 mm subumbilical and a 5 mm right iliac fossa laparoscopic ports; the laparoscope is then shifted from subumbilical port to the right iliac fossa port. A 2-0 prolene (chemical name: polypropylene is a non- absorbable; synthetic; suture; Ethicon Inc.; Johnson and Johnson) suture is passed around the 10 mm port by inserting a suture passer needle 5 cm below the subumbilical incision. The peritoneal dialysis catheter is then introduced into the peritoneal cavity through 10 mm port.

The 10 mm port is then slowly withdrawn over the peritoneal dialysis catheter. The peritoneal dialysis catheter is now hitched to the anterior abdominal wall by tightening the suture around it. The extra length of suture is divided flush to skin; as the tied knot gets buried in the subcutaneous tissue (figure 1 and supplementary figures 1-6). The peritoneal dialysis catheter is then tunneled in the subcutaneous tissue and brought out through a small skin incision lateral and inferior to the left of umbilical port site. Rectus sheath at 10 mm port is closed with 1-Ovicryl suture (chemical name: polyglactin 910 is an absorbable; synthetic; braided suture; Ethicon Inc.; Johnson and Johnson). Skin closed with staples or 2-0 nylon suture. Closure of skin at site of suture passage is optional. The advantage of this procedure is that the catheter can be fixed as low as possible and does not require a tough structure like posterior rectus sheath; which sometimes end at a superior level. However; the expertise in laparoscopic surgery is required. Prior to the adaptation of this procedure the migration and malfunction of the catheter was noted in 7 out of 11 patients; 63.6% (age: 44.4 ± 11.4 years; males: 9). After the adaptation of this procedure there was no migration in ten patients (40.7 ± 9.4 years; males: 8). Till now none of the patients who underwent catheter placement by this insertion technique have suffered peritonitis. But caution has to be exercised; to refer to the operation notes of insertion technique when the catheter is being removed for the refractory peritonitis.

**Conclusions:** The cutting of this suture might have to be done before removing the catheter.

**Correspondence:** Dr. Ram R, Sri Venkateswara Institute of Medical Sciences, Tirupati.
Email: ram_5_1999@yahoo.com
Occurrence Of Mishaps In The Procedure Of Peritoneal Dialysis

P. Sandeep, B. Varalakshmi; C. Krishna Kishore; R. Ram; V. Sivakumar.
Department of Nephrology; SIVMS; Tirupati

Background: Continuous ambulatory peritoneal dialysis (CAPD) as a modality to sustain life in chronic kidney disease has been in vogue for over 4 to 5 decades in the medical practice. Multiple factors may influence the effectiveness of chronic peritoneal programme. Continuous monitoring and review of various aspects of clinical standards enhance the opportunity in bridging the gap between existing practice and good practice; and good practice to best practice.

Aim Of The Study: In addition to the advances in the technology and medical aspects; patients training and education are also proved to be essential components of peritoneal dialysis programme.

Methods: One of the areas that require particular attention has been peritonitis. Peritonitis remains a major complication of peritoneal dialysis accounting for much of the morbidity associated with the technique. It accounts for 15 to 35% of hospital admissions and is a major cause for transfer to hemodialysis as a result of technique failure. In addition peritonitis exercise its say on morbidity and mortality. A recent report from Netherlands brings out that the proportion of patients that switch from peritoneal dialysis to hemodialysis for various reasons in Netherlands is 3 times higher than the proportion of patients on hemodialysis switching to peritoneal dialysis.

Results: Most of the literature has been found to include the various practices of connectology; modes of contamination and the management of peritonitis. But peritonitis occurring secondary to mishaps or certain accidental happenings found no special mention. Keeping this in view we present 3 situations in 3 different patients resulting in peritonitis Patient 1 – A 55 year old male; a patient of type 2 diabetes; hypertension & ESRD on CAPD for 16 months presented with features of peritonitis found to be secondary to staphylococcus aureus and was treated as per sensitivity pattern which resulted in gratifying outcome. On discussion with family members it was brought out that a day before the development of peritonitis they found that the minicap was missing from transfer set (extension tubing) which would have resulted a breach in the procedure of sterile practice. This incidence suggests the possibilities of a defect in cap or its placement Patient 2 – A 50 year old male; a patient of; diabetic & ESRD on CAPD for 13 months treated for peritonitis secondary to Acinetobacter as per sensitivity pattern which recovered after three weeks. On discussion regarding any lapse in the technique; the patient disclosed that while separating the outer bag from the inner bag with help of the scissors; the inner bag was cut open accidentally and rent was sealed by applying a plaster by him 2 days prior to the peritonitis episode. This suggested the possibility for the cause of peritonitis. Patient 3 – A 62 year old male; a patient of diabetic & ESRD on CAPD for 24 months presented with culture negative peritonitis which recovered after three weeks. On enquiry he said he found a leak; at the junction of the tube with the bag which he sealed by applying a plaster a day before development of peritonitis. Patient 4 -- A 65 year old female; type 2 diabetic & ESRD was initiated on CAPD. During training period; she cut the peritoneal catheter while cutting the adhesive plaster used to apply to the dressing. She
developed peritonitis due to Pseudomonas. The peritonitis was refractory and catheter had to be removed. The above 4 situations of mishaps suggest that there was a lapse in the standard of practice either due to a deficiency in the understanding the procedure by the patient and or the attendant or due to inadequate efforts from the professional care givers in imparting adequate education and periodic reiteration on the technique and the procedure.

Conclusions: This reinforces fact that there is a need for a committed and co-operated effort from the receiver; care provider on the importance of aseptic precautions to be followed while conducting the procedure; strict adherence to the protocol; safety measures to prevent peritonitis and its complication.

Correspondence: Dr. Ram R, Sri Venkateswara Institute of Medical Sciences, Tirupati.

Email: ram_5_1999@yahoo.com

Icodextrin Induced Symptomatic Hyponatremia In A Continuous Ambulatory Peritoneal Dialysis (CAPD) Patient - A Case Report.

Padmanabhan S, Anil Kumar BT and Manjunath S. Institute of Renal Sciences; BGS Global Hospitals; Bangalore

Background: Icodextrin is a glucose polymer which is widely used as an osmotic agent in CAPD solutions. Its use is intended to increase ultrafiltration besides limiting hyperglycemia and Advanced Glycation End Products (AGE) associated peritoneal membrane damage caused by dextrose based PD solutions. It is generally well tolerated.

Aim Of The Study: It is well known that it causes mild hyponatremia.

Methods: Severe symptomatic hyponatremia with its use has been rarely reported. We report a case of severe hyponatremia due to Icodextrin use in one of our CAPD patients.

Results: This 72 year old gentleman was initiated on CAPD in December 2008 for CKD stage V D of uncertain etiology. He has been doing well on CAPD with conventional glucose based solutions (2L 2.5% solution x 2 and 2L 1.5% solution x 2) He was a low average transporter to begin with. He noticed progressive decline in ultrafiltration from August 2011. PET done in February 2012 revealed high average transporter status. He was put on night dwell of Extraneal (2L 7.5% Icodextrin) from April 2012. Mild hyponatremia was first noticed in May 2012 (serum sodium 134 mEq/L). There was a progressive decline in his serum sodium from then on. He became symptomatic from October 2012 and had multiple admissions and saline infusions to correct the hyponatremia. Hence APD (10 l of 2.5% solution over 10 hours) was initiated in May 2013. His serum sodium improved (134 mmol/L) and he was doing well. One month later he came in with fluid overload due to decreased ultrafiltration in APD. Hence a day time exchange of Extraneal was added for 2 weeks. He once again developed hyponatremia with severe symptoms. Other causes of hyponatremia including hypothyroidism and hypocortisolism were ruled out on two occasions. With discontinuation of Extraneal he became better. Icodextrin has an established safety record. Studies have documented that Icodextrin use results in a statistically significant fall in serum sodium. Clinical sequelae because of this are rarely reported. The mechanism by which Icodextrin causes hyponatremia is unclear. Gradden et al from Liverpool; UK have reported two patients with hyponatremia related neurological sequelae from Icodextrin based CAPD solution use in the year 2001. That our patient had symptomatic hyponatremia related to Icodextrin
use is proven beyond doubt as it recurred the second time when we reintroduced it.

**Conclusions:** Symptomatic hyponatremia is a rare but potential complication of use of Icodextrin based CAPD solution. Physician awareness of this complication will help in early detection and safe management of these patients.

**Correspondence:** Dr. S. Padmanabhan, Institute of Renal Sciences; BGS Global Hospitals, Bangalore 560034.

Email: padmanabhan_subr@yahoo.com

**Gabapentin For Intractable Hiccups In A Patient On Continuous Ambulatory Peritoneal Dialysis Patient (CAPD)**

**Padmanabhan S, Anil Kumar BT and Manjunath S Institute of Renal Sciences; BGS Global Hospitals; Bangalore; India**

**Background:** A hiccups is an involuntary contraction of the diaphragm that may repeat several times per minute. Hiccups which persist for over one month are classified as intractable. It may represent an underlying organic pathology such an end stage kidney disease. We report a patient on CAPD with intractable hiccups which resolved after gabapentin therapy; while all the other measures failed.

**Aim Of The Study:** A 72 year old gentleman was initiated on CAPD in the year 2008 for ESRD of uncertain aetiology.

**Methods:** He had undergone CABG in 2007. The only other comorbidity he had was seizure disorder for which he is on levitiracetem. He developed hiccups which was severe enough to result in anorexia; weight loss and insomnia. Conventional therapy for hiccups failed to give him relief. We ruled out other potential causes of hiccups in him. He had adequate dialysis (weekly Kt/V was 2). He refused to switch to haemodialysis. In view of the refractory and idiopathic nature of his hiccups; he was started on Gabapentin 100mg at bedtime. After two weeks of therapy hiccups resolved completely. He continues to take the medication and has been hiccups free for the past 6 months.

**Results:** There are many reports of successful use of gabapentin for intractable hiccups in cancer and GI disorders. It has not been used frequently in end stage renal disease. In studies were gabapentin was used for hiccups; no side effects was reported. Moreover; gabapentin is effective in control of pruritus and restless leg syndrome in ESRD patients.

**Conclusions:** Gabapentin can be used in patients on CAPD for intractable hiccups. To the best of our knowledge this is the second report of the use of Gabapentin for intractable hiccups in CAPD patients.

**Correspondence:** Dr. S. Padmanabhan, Institute of Renal Sciences; BGS Global Hospitals, Bangalore 560034.

Email: padmanabhan_subr@yahoo.com

**Hypoalbuminemia In CAPD Patients - Role Of Peritoneal Loss Of Albumin: A Single Center Study**

**Vinod Kumar, Deepak Kumar; Gokulnath**

Department of Nephrology, St John's Medical College; Hospital, Bangalore

**Background:** The loss of serum proteins in stable continuous ambulatory peritoneal dialysis (CAPD) patients average between 5-10 g/day; out of which 4-6 gm is albumin; marked differences are present in protein loss through PD fluid between individual patients and this depends on effective peritoneal surface area and the intrinsic size selective permeability.
Aim Of The Study: It has been hypothesised that patients with high rates of solute transport may have greater dialysis protein loss leading to hypoalbuminemia and malnutrition.

Methods: 1. To study correlation of dialysate albumin loss and hypoalbuminemia in CAPD patients. 2. To study relationship between dialysate albumin loss and membrane transport states. Patients with ESRD who were initiated on CAPD and undergoing regular follow up at our center were prospectively studied over 12 months. Patients newly initiated on CAPD with age above 18 years and serum albumin >3.0 mg/dl were included. Patients on APD; peritonitis during the study period; chronic liver disease; CCF; malabsorption syndrome; chronic inflection like tuberculosis; HIV; malignancies were excluded from the study.

Results: All patients were advised on a dietary protein of 1.2 g/kg/d of high biological value protein and followed up every month. Peritoneal transport status was determined by standard PET. The resulting 4-hour dialysate to plasma creatinine (D/P cr) was used to classify patients as low; low average; high average or; high transporters. Serum albumin (bromocresol green method); total protein; weekly creatinine clearance (CrCl); weekly Kt/v and 24 hour protein and albumin losses (dialysate; urine) were recorded; at the initiation of CAPD and at 6 and 12 months follow up. Total protein and albumin losses from the dialysate were measured by 4 hour D/P protein and albumin. CRP levels were monitored at the initiation and at follow up. Statistical analysis was performed using SPSS 18 software; student t-test was used to compare linear variables and Chi square test was used to analyse categorical variables. 40 patients were included in the study. 34 patients completed the study period. (3 developed peritonitis; 2 developed tuberculosis; 1 died due to coronary artery disease). Mean age of study group was 53±11 years and males (n=24) were predominant than females (n=10). Predominant cause of ESRD was diabetes mellitus (73%); followed by CGN (23%) and ADPKD (6%). Mean CRP levels at the initiation was (0.8±0.3) and increased on follow up at 6 months (1.1±0.4) and 12 months (1.5±0.3). Solute transport status consisted of high transporters (35%); high average (30%); low average (27%) and low transporters (8%). In the High and High average group; mean total protein and albumin at the initiation of the study was (5.9±0.8 g/dl and 3.3±0.5 g/dl) and on follow up there was a significant decrease in total protein and albumin at 6 months (5.7±0.6 g/dl and 3.1±0.4 g/dl) and at 12 months (5.5±0.5 g/dl and 2.9±0.2 g/dl) (p=0.03); where as in Low and Low average group mean total protein and albumin at the initiation of the study was (5.7±0.6 g/dl and 3.4±0.5 g/dl) and on follow up there was no significant reduction in total protein and albumin at 6 months (5.8±0.6 g/dl and 3.3±0.4 g/dl) and at 12 months (5.9±0.5 g/dl and 3.0±0.2 g/dl) (p=0.9). In High and High average group the mean 24 hour dialysate protein and albumin loss was (5.6±1.0 g/dl and 3.0±0.4 g/dl) respectively and was significantly higher as compared to Low and Low average group (5.0±0.6 g/dl and 2.4±0.3 g/dl) (p=0.02). The decline in the serum protein and albumin significantly correlated with 24 hour dialysate albumin and protein loss (P=0.008) in High and High average group. No significant correlation was found between 24 hours urinary protein and albumin loss with the serum protein and albumin (P=0.8).

Conclusions: 1. Hypoalbuminemia in CAPD patients strongly correlates with the dialysate albumin loss. 2. High and High average transporters are prone for higher dialysate albumin loss and hypoalbuminemia.
**Correspondence:** Dr. Gokulnath, Department of Nephrology, St. John's Medical College; Hospital, Bangalore.

Email: gokulnath.neph@gmail.com

**Gastric Bleeding Reduced Upon Switch From Haemodialysis To**

Ram R; Sandeep P; Varalaxmi B; Chaitanya V; Krishna Kishore C; Siva Kumar V; Dakshina Murty KV Sri Ramachandra Centenary Memorial Hospital at Vijay Nagar Colony; Hyderabad

**Background:** A 65-year-old lady has been on maintenance haemodialysis for end stage renal disease due to type 2 diabetes mellitus and hypertension for the past six years. She was on regular recombinant erythropoietin therapy. She presented with history of malaena of one week duration and vomiting of 2 days duration. She also complained of haemetemesis of one day duration.

**Aim Of The Study:** The haemoglobin had reduced from 12.0 g/dL to 4.0 g/dL. Gastrointestinal endoscopy (figure) revealed gastric antral vascular ectasia (GAVE).

**Methods:** On gastric biopsy the histologic changes included superficial hyperplastic antral mucosa; capillary ectasia with thrombosis; and fibromuscular hypertrophy of the lamina propria. Argon plasma coagulation was done for six times over a month; but the malaena did not subside. She was given heparin free haemodialysis sessions to reduce malaena.

**Results:** The recombinant human erythropoietin and intravenous iron sucrose requirements increased over a two months period. Despite that; she became transfusion dependent. Due to repeated blood transfusions; she had sero-converted to hepatitis C virus. It was confirmed by 3rd generation ELISA. Her HCV RNA copies were 40 million per millilitre. The patient was then; switched to continuous ambulatory peritoneal dialysis (CAPD) and haemodialysis was discontinued. After adequate training and initiation of regular CAPD exchanges; the haemoglobin stabilized at 8.2 g/dL; without requiring further blood transfusions. There were few retrospective reports that suggest; GAVE might be a cause of 19-32% gastrointestinal tract bleeding episodes in patients with chronic renal failure. These lesions are located mainly in the stomach and the duodenum but the jejunum and the colon could also be affected. In a recent series of 45 patients with typical GAVE; six patients had chronic renal failure. This form of angiodysplastic lesion confined to the gastric antrum was first described in 1953 by Rider et al. and named antral vascular ectasia. The term watermelon stomach was coined in 1984 by Jabbari; owing to its endoscopic features like longitudinal gastric antral folds containing visible vessels radiating from the pylorus and resembling the skin of a watermelon. The absence of signs of gastric inflammation on biopsy rules out haemorrhagic antritis; a frequent misdiagnosis. As biopsy carries only a minimal risk of haemorrhage; it should always be performed. Pharmacologic therapies have been described with the use of corticosteroids; estrogen–progesterone combinations; tranexamic acid; thalidomide; &Interferon; calcitonin; and cyproheptadine. Endoluminal therapies include endoscopic band ligation; sclerotherapy; heater probe; and argon plasma coagulation; which are emerging as the preferred endoscopic therapy. In addition surgery can also be tried. There was only one report of successful reduction of gastrointestinal bleeding due to GAVE by shifting the patient from haemodialysis to CAPD.
Conclusions: In our patient the shift from haemodialysis to CAPD was necessitated owing to the continued malaena even after argon photocoagulation.

Correspondence: Dr. Ram R, Sri Venkateswara Institute of Medical Sciences, Tirupati.
Email: ram_5_1999@yahoo.com

Chronic Ambulatory Peritoneal dialysis as a modality of treatment in a patient of cardiorenal syndrome type 2 with chronic kidney disease stage III
Rajesh Kumar, Vinay Malhotra, Dhananjai Agarwal, Pankaj Beniwal, Mohit Mathur
Department of Nephrology, Sawai Man Singh Medical College & Hospital, Jaipur. Rajasthan, India.

Background: Cardiac and renal dysfunction often occur concurrently because they share common cause and pathogenic mechanism.

Aim Of The Study: Cardiorenal syndromes (CRS) type II is a serious condition in which chronic cardiac abnormalities causes worsening of kidney function, leading to permanent chronic kidney damage.

Methods: Management of CRS type II coupled with diuretic resistant congestive heart failure (CHF) has been an issue of dispute. Here we are going to discuss a case whose symptoms were non-responsive to conventional treatment of refractory heart failure (RHF) and optimal dose of diuretics. Due to relative contraindication of haemodialysis in this patient peritoneal dialysis (PD) for ultrafiltration (UF) was started as a therapeutic approach.

Results: There was significant improvement in renal and cardiac function.

Conclusions: Clinically he responded well from a severely ill state (New York Heart Association class IV) to regain his ability to take part in standard activities of daily living, reduced hospitalization, reduction in the need of diuretics, and notably, improved quality of life. Dr. Rajesh Kumar, Room no 176, Residents Doctor's Hostel, SMS Medical College, Jaipur, Rajasthan, India. 302004.
Email: drrajeshkumar80@yahoo.com

Evaluation Of Nutrition In Adults On By Bioelectrical Impedence Analysis (Bia) And Anthropometry And The Impact Of Intervention On Their Nutrition
Department of Nephrology, Post Graduate Institute of Medical Education and Research & Dr. Ram Manohar Lohia Hospital, New Delhi.

Background: Protein energy wasting (PEW) are highly prevalent in CAPD patients and is a strong risk factor for morbidity and mortality in these patients. High index of suspicion and vigilant monitoring for early diagnosis and multipronged approach in the management of malnutrition led to the good outcome. The Evaluation of PEW in continuous ambulatory peritoneal dialysis (CAPD) patients in especially using BIA and the impact of intervention has not been studied in much detail in Indian population.

Aim Of The Study: Evaluation of Protein energy wasting in adults on CAPD by Clinical, Anthropometry, Biochemical and
Bio impedance analysis method. Impact of Intervention on patients with malnutrition.

**Methods:** 63 CAPD patients (M=28, F=35) were assessed for their nutritional status and inflammation after minimum 3 months of CAPD initiation. Nutritional status was assessed by dietary diary, Anthropometry, Subjective global assessment, multi-frequency BIA and serum albumin, S.pre-albumin, S.transferrin, S.cholesterol. Inflammation was assessed by hs-CRP > 3mg/l and IL-6 > 2 pg/ml. Based on different method, diagnosis of malnutrition was made. Appropriate nutritional intervention, as per K-DOQI guidelines was given to those patients satisfying the study criteria. Various methods of intervention are Dietary counseling, treatment of inflammation, Adequacy of dialysis, Correction of acidosis and other methods (Anabolic steroids, Psychiatric counseling, and Appetite stimulant. Gastrointestinal motility drugs, Phosphate binders were with held.) Subsequent nutritional status and impact of intervention of patient was assessed at the end of 1st and 6th month.

**Results:** The mean values of calorie, protein / Kg/day, S.protein, S.Albumin, S.Pre-albumin, S.Transferrin and S.Cholesterol were 25.4 Kcal, 0.81 gm, 5.9 gm/dl, 3.0 gm/dl, 21.11 mg/dl, 130.6 mg/dl and 155.9 mg/dl respectively. The prevalence of malnutrition was high as 80% . By SGA – 82%, by S.Albumin – 79.4%, lean tissue index -76%. The prevalence of inflammation is as high as 70% . LTI correlates significantly with Kcal/kg/day food intake, mid arm circumference, mid arm muscle circumference and pre-albumin. FTI correlates significantly with BMI, MAC, TST, MAMC, c MAMA and Kt/V. Kcal intake/kg/day, protein intake/day and phase angle were independent predictors of PEW. No of well nourished CAPD patients increased from 17.5% to 52.4%, 20.6% to 58.7%, and 23.9% to 65.1% by grading of malnutrition assessed by SGA, Albumin Severity and LTI respectively after intervention.

**Conclusions:** The prevalence of malnutrition was high as 80% based on different methods. BIA is highly sensitive. Around 35 - 40% of CAPD patients became well nourished from PEW, statistically significant improvement in the nutritional status after intervention. Dietary management is an integral part.

**Correspondence:** Dr. Venkataramanan K, Department of Nephrology, P.G.I.M.E.R & Dr. Ram Manohar Lohia Hospital, New Delhi.
Email: drramanan_md@yahoo.co.in
Outcomes Of Continuous Ambulatory Peritoneal Dialysis In Children With End Stage Renal Disease: 15-year Experience From A Tertiary Care Center

Dharshan Rangaswamy, Narayan Prasad; Amit Gupta; Raj Kumar Sharma; Dharmendra Singh Bhadauria; Anupama Kaul
Department of Nephrology, Sanjay Gandhi Post Graduate Institute of Medical Sciences; Lucknow

Background: Peritoneal dialysis (PD) is the most commonly used modality of dialysis in children. Very few centers in India have the necessary trained personnel and equipment for children to remain on maintenance hemodialysis. There is a paucity of published experience of PD in children from developing countries. We retrospectively studied our 15 years experience of ESRD children on PD.

Aim Of The Study: The outcome of PD was studied in children ≤18 years of age; at a single tertiary care center.

Methods: Retrospective analysis of the data collected between 1998 and 2012 included the type of catheter; site and technique of insertion; surgical complications; duration on PD; peritonitis rate; technique failure and patient outcomes.

Results: A total of 68 Tenckhoff (58 double cuff; 10 single cuff) catheters were inserted in 66 patients (mean age 12±6 years; range 3-18 years; boys 41). All catheters were surgically implanted and partial to subtotal omentectomy was performed in 10 (15.15%) cases. The entry-site was midline in 26 cases (39.4%) and paramedian in 40 (60.2%). There were 6 cases of incisional hernia requiring surgical repair. The mean break-in period was 12±3 days. Of the 66 patients; 31 had 45 episodes of peritonitis and 3 patients had an exit site infection. The peritonitis rate was 0.42 episodes per patient year. E.coli was the commonest organism causing peritonitis. On outcome analysis; 13/66 (19.7%) patients received a renal transplant; while 13/66 (19.7%) continued on CAPD; awaiting a kidney transplant. Of the rest; twenty nine (43.9%) patients died; two (3%) suffered technique failure and were shifted to hemodialysis and nine (13.6%) were lost to follow-up. The mean patient survival on CAPD was 41.6 patient months (95% CI 28.9-54.3) and the mean death censored technique survival was 54.5 patient months (95% CI 40.1-68.8). The mean patient survival was 84.8.2% at 1 year; 76.6% at 2 years; 66% at 3 years; 46.2% at 5 years and 29% at 9 years.

Conclusions: PD is a successful home maintenance dialysis technique for end stage renal disease in children waiting for kidney transplantation in a resource poor developing country.

Correspondence: Narayan Prasad, Additional Professor Of Nephrology, SGPGIMS, Lucknow
Email: narayan@sgpgi.ac.in; narayan.nephro@gmail.com

Outcomes Of Hiv Infected Esrd Patients On Mhd Vis-à-vis: Our Experience

Mallikarjuna H.M, Deepak kumar; Gokulnath.
Department of Nephrology, St John's Medical College Hospital, Bangalore

Background: Overall survival of HIV-infected has increased over the last decade. In parallel a higher need for renal replacement therapy (RRT) in this population has been more observed. RRT associated complications and outcomes have changed greatly since the introduction of highly active antiretroviral therapy (HAART) and limited data is available regarding the outcomes of maintenance hemodialysis (MHD) and
continuous ambulatory peritoneal dialysis (CAPD) in HIV infected patients under HAART in our country.

**Aim Of The Study:** 1. To study outcomes of HIV patients with ESRD on RRT (MHD vs CAPD). 2. To compare quality of life between these groups.

**Methods:** All the HIV patients with ESRD undergoing RRT (MHD or CAPD) at our center were prospective studied over 8 years from July 2004 to August 2012. Patients above 18 years of age; on RRT at least for duration of 6 months were included in the study. Patients with prior documented CAD; those with concurrent malignancies; transferred to other modality of RRT or underwent transplant and those lost to follow up were excluded. Demographic (age; sex; occupation; employment status; socio economic strata) Clinical (etiology of ESRD; EPO dosage; duration of HIV infection; CD4 counts; history of HAART; opportunistic infections; co-infections; hospitalizations; cardiovascular events; deaths) and Laboratory data (hemoglobin; albumin; calcium; phosphorous; lipids; vitamin D; PTH levels) were analyzed and followed up during the study period.

**Results:** All the HIV patients with ESRD undergoing RRT (MHD or CAPD) at our center were prospective studied over 8 years from July 2004 to August 2012. Patients above 18 years of age; on RRT at least for duration of 6 months were included in the study. Patients with prior documented CAD; those with concurrent malignancies; transferred to other modality of RRT or underwent transplant and those lost to follow up were excluded. Demographic (age; sex; occupation; employment status; socio economic strata) Clinical (etiology of ESRD; EPO dosage; duration of HIV infection; CD4 counts; history of HAART; opportunistic infections; co-infections; hospitalizations; cardiovascular events; deaths) and Laboratory data (hemoglobin; albumin; calcium; phosphorous; lipids; vitamin D; PTH levels) were analyzed and followed up during the study period. 42 patients were studied after fulfilling the inclusion criteria. They were divided into two groups; group A (MHD) (N=24) and group B (CAPD) (N=18). Mean age in group A was (43.4 ± 4 yrs) and was comparable to group B (41.8 ± 5 yrs); Males were predominant in both the groups (group A=84% and group B=92%). Mean duration of dialysis was comparable between the two groups (group A=54±14 months and group B=48±10 months). 78% of patients in group A and 65% in group B were diabetics. Mean duration of HIV was 9.3±4 yrs in group A and 7.6±3 yrs in group B. CD4 cell count > 200/mm3 was seen in 68% (group A) and 85% (group B). All the patients who required HAART were treated (54% in group A and 46% in group B). Mean hemoglobin levels in group A (9.9±0.6 gm/dl) was significantly lower as compared to group B (11.4±0.7 gm/dl) (p=0.04). Mean hospitalization rate in MHD group (1.11/ patient/year) was higher as compared to CAPD group (0.93/patient/year) (p=0.8). Mean duration of hospitalization was also higher in MHD group (32.1±9 days) as compared to CAPD group (28.7±11 days) (p=0.6) but was not statistically significant. Predominant cause of death in both the groups was sepsis (MHD group =63% & CAPD group =54%) followed by coronary events (MHD group =21% & CAPD group =18%). Survival in MHD group (64±21 months) was lower than CAPD group (68±32 months) but was not statistically different (p=0.8). QOL as assessed by SF 36 scores was significantly better in MHD group as compared to CAPD group (p=0.03).

**Conclusions:** Outcome of HIV patients in terms of morbidity and mortality was similar in both forms of RRT (MHD vs CAPD) though the rate and duration of hospitalization tended to be higher in MHD group. 2. Quality of life (QOL) was better in HIV patients on CAPD as compared to those on MHD.

**Correspondence** Dr. Gokulnath, Department of Nephrology, St. John's Medical College; Hospital, Bangalore.

Email: gokulnath.neph@gmail.com
Complications And Outcomes Of Chronic Peritoneal Dialysis In A Tertiary Care Center - An Observational Cohort Study

Ninoo George, Alexander S; David VG; Jacob S; Mohapatra A; Valson A; Basu G; Varughese S; Jacob CK; Tamilarasi V

Department of Nephrology; Christian Medical College; Vellore

Background: The success of peritoneal dialysis and patient outcomes are influenced by various infective and non-infective complications occurring during chronic peritoneal dialysis (CPD). Only limited data is available on the immediate complications of the blind; percutaneous technique of CAPD catheter insertion; done by nephrologists. Infective complications remain an important cause of morbidity and mortality on CPD.

Aim Of The Study: 1) To study complications of blind; percutaneous versus open; surgical techniques of PD catheter insertion 2) Incidence; profile and risk-factors of PD-related infections 3) Patient outcomes.

Methods: We conducted an observational study of patients initiated on PD from January 2009 to March 2012. The double-cuffed Tenckhoff PD catheter was inserted using blind; percutaneous or open surgical technique. Data was collected from patient records. Standard definitions were used for peritonitis; tunnel and exit-site infections. Mortality; catheter loss; transfer to hemodialysis and transplantation were studied as outcomes.

Results: 178 patients with a mean age of 49.8 ± 14.7 years were followed up for a median period of 14.5 months (IQR 0-47). The male-female ratio is 1.8:1. The underlying renal disease was diabetic nephropathy in 52.3% patients. PD catheter was inserted using blind; percutaneous technique in 152 (85.4%) patients. Catheter insertion-related complications occurred in 26.9% in open-surgical group and 15.1% in percutaneous group (p; 0.091). The occurrence of peri-catheter leak and poor outflow occurred significantly less in the percutaneous group compared to the open; surgical group (3.3% Vs 11.5% p; 0.031 and 3.3% Vs 11.5% p; 0.009 respectively). Overall among 178 patients; the peritonitis rate is 1/27 patient-months or 0.44 episode/year-at-risk. Exit-site infection occurred in 2.8% and tunnel infection in 3.9%. Among culture-positive cases (67%); majority were gram-negative (52.9%). Gram-positive; mycobacterial and fungal infections accounted for 17.6%; 8.8% and 20.5% respectively. The incidence of culture negative peritonitis is 33%. Mortality occurred in 37.1% patients. In multivariate logistic regression analysis; age >55 years (p=0.002); female sex (p=0.008); diabetes (0.028) and concomitant HIV (p=0.006) or HCV infection (0.037) were significant predictors of mortality.

Conclusions: The blind; percutaneous technique of PD-catheter insertion is safe. Peritonitis incidence is 0.44 episode/patient-year-at-risk; mostly caused by gram-negative organisms. Age >55 years; female sex; diabetes mellitus and concomitant HIV/HCV infection significantly predicted mortality.

Correspondence: Dr. Ninoo George, Department of Nephrology; Christian Medical College, Vellore 632004.
Email: ninoogeorge@gmail.com

Factors Predicting Mortality In Diabetic Peritoneal Dialysis (pd) Patients In India

A.K. Mahapatra, Narayan Prasad; Archana Sinha; RK Sharma; Amit Gupta; Dharmendra Bhadauria; Anupama Kaul

Department of Nephrology, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow

Background: Diabetes mellitus (DM) is the most common cause of end-stage renal diseases (ESRD). Malnutrition is a major cause of morbidity and mortality in the ESRD patients on PD. Survival of the diabetic PD patients is inferior to non diabetic PD patients probably because of higher prevalence of
cardiovascular diseases (CVD) and high prevalence of malnutrition associated with diabetes.

**AIM OF THE STUDY:** We undertook this study to evaluate the impact of CVD and other risk factors individually or in combination on mortality in diabetic PD patients.

**METHODS:** All patients underwent assessment of nutritional status; adequacy of dialysis; residual renal function (RRF); peritoneal transport characteristics and comorbid diseases (Davies comorbidity Index).

**RESULTS:** 342 PD patients (179 diabetics; 250 male; age 51±14 years) were followed for 22±14 months. Of 342 patients; 87 (25.44%) had normal nutritional status; 229 (66.96%) had a mild to moderate grade of malnutrition; and 26 (6.7%) had severe malnutrition based on SGA. CVD was present in 53 (15.5%) of the patients. On Davies Index; 156 (45.6%) patients were classified into low risk; 168 (49.1%) patients had medium risk and 18 (5.3%) had high risk. Female diabetic patients had significantly lower SGA score; higher prevalence of CVD; lower albumin levels; lower mean calorie and protein intake and more number of deaths compared to other group (P=0.001). On Kaplan–Meier analysis; patient survival was significantly lower in female DM patients compared to other groups. The estimated patient survival (patient months) in diabetic female (27.2) was significantly lower compared to Diabetic male (40); non diabetic female (49) and non diabetic male (59) [p<0.001].

The Hazard ratio for risk of mortality in diabetic female PD patients was significantly higher [HR 3.8(95% CI 0.71-3.12; p=0.001] than diabetic male [HR 2.7 (95% CI 1.5-4.9); p=0.001] and non diabetic female [HR 1.5(95% CI 0.71-3.1), p=0.293] compared to non diabetic male as reference category. On Cox proportional hazards univariate analysis including all patients; old age; diabetes; presence of CVD; malnutrition; low serum albumin concentration and low RRF were independent predictors of mortality but not female gender. On multivariate cox hazard analysis malnutrition; presence of CVD and GFR were significant factors predicting survival not diabetes. DM patients with both CVD and protein-energy malnutrition (PEM) had 3.7 times risk of mortality (p=0.029) than those without. There was no significant difference between the estimated patient survival (patient month) in patients without CAD and PEM between diabetic and non diabetics (40.5 vs. 49.2; p=0.295).

**CONCLUSIONS:** DM per se was not a risk factor for mortality in this group of PD patients. The higher mortality rate in diabetic PD patients; in particular among female was mainly because of concurrent morbidity such as CVD and PEM; together with low RRF.

**Correspondence:** Narayan Prasad, Additional Professor Of Nephrology, SGPGIMS, Lucknow

Email: narayan@sgpgi.ac.in; narayan.nephro@gmail.com

**Correlation Of Bioelectrical Impedence Analysis (Bia) And Clinical Anthropometry In The Evaluation Of Nutrition In Adults On CAPD**


Department of Nephrology, Post Graduate Institute of Medical Education and Research & Dr. Ram Manohar Lohia Hospital, New Delhi.

**Background:** Protein energy wasting (PEW) are highly prevalent in CAPD patients and is a strong risk factor for morbidity and mortality in these patients. The use of multi-frequency bioelectrical impedance analysis (BIA) to measure body composition and nutritional status and the relationship of BIA indexes to the various nutritional assessment methods have not been studied in much detail in CAPD patients in India.
**Aim Of The Study:** Evaluation of Protein energy wasting in adults on CAPD and to find the correlation between various indices measured by BIA, Serological, subjective global assessment and anthropometry method.

**Methods:** 189 CAPD patients (M = 84, F=105; mean age 57.6 years ± 11.6 years) were assessed for their nutritional status after minimum 3 months of CAPD initiation. Nutritional status was assessed by dietary diary, BIA (lean tissue index, fat tissue index, phase angle, reactance, resistance, extracellular water) anthropometry (weight, BMI, MAC, TST, MAMC, MAMA), subjective global assessment, and serum albumin, S.pre-albumin, S.transferrin, S.cholesterol, HsCRP. The patients were categorized into different grades of malnutrition, (1) normal nutritional status, (2) mild-moderate malnutrition, and (3) severe malnutrition based on SGA (ratings 6-7:3-5:1-2) and S. albumin respectively. Correlation between various indices measured by BIA and various other nutritional assessment methods were analyzed statistically.

**Results:** Mean age of the patients was 57.6 years ± 11.6 years. The average calorie and protein intake / Kg/ day were 25.5±4.6 Kcal and 0.81 gm respectively. The mean and standard deviation of BMI(23.7±5), MAC(26.3±4.5)Cm, TST(1.624±0.4)Cm, MAMC(25.6±4.5), CMAMA (45.7±19.7), were respectively. The mean values of S.protein, S.Albumin S.Pre-albumin, S.Transferrin, S.Cholesterol, S.Triglyceride, hs-CRP and IL-6 were 5.9 gm/dl, 3.0 gm/dl, and 21.11 mg/dl, 130.6 mg/dl, 155.9 mg/dl, 136.1 mg/dl, and 8.8±7.6 mg/l and 8.4±12.2 pg/dl respectively. Based on SGA, 17.4%; 54%; 28.6% ; S.albumin 21%,62%,17% : BMI 52%; 37%; 11% of CAPD patients had normal, moderate, severe malnutrition status respectively. 76.1% and 9.5% of CAPD patients were malnourished based on LTI and FTI respectively. LTI correlates significantly with Kcal/kg/day food intake, mid arm circumference, mid arm muscle circumference and pre-albumin. FTI correlates significantly with body mass index, mid arm circumference, tricipital skin fold thickness, mid arm muscle circumference, mid arm muscle area, S.Albumin and S.cholesterol. Phase angle co-relates (significantly) with S. albumin, S.bicarbonate and S.cholesterol, BMI, MAC, TST, MAMC, c MAMA and adequacy of dialysis.

**Conclusions:** Majority of CAPD patients were malnourished (80%). BIA is a quick, inexpensive, noninvasive method and has shown great potential for use in estimating body composition and nutritional status in CAPD patients and BIA indices shown significant correlation with various other nutritional assessment method indices.

**Correspondence:** Dr. Venkataramanan K, Department of Nephrology, P.G.I.M.E.R & Dr. Ram Manohar Lohia Hospital, New Delhi.

Email: drramanan_md@yahoo.co.in

**Reverse Auto Peritoneal Dialysis Resulting In Pseudo Acute Renal Failure**

Ram R, Sandeep P; Varalaxmi B; Chaitanya V; Sangeetha Laxmi B; Krishna Kishore C; Siva Kumar V

Nephrology; Sri Venkateswara Institute of Medical Sciences; Tirupati; India

**Background:** A rise in serum creatinine without acute kidney injury (AKI) is possible. In the last five years three patients presented to us for high serum creatinine levels after binge alcohol consumption. We already reported two of these three patients (1; 2). For the first one dialysis was instituted as the initial diagnosis was AKI. With the experience gained; the next two patients were examined specifically for a particular cause. They were not dialyzed.

**Aim Of The Study:** The data of the third patient were: a 44 year old male; admitted after a fall following binge alcohol
consumption. He complained of painful abdominal distension and was anuric.

**Methods:** Serum creatinine was 6.5 mg/dL (575 µmol/L); blood urea: 66 mg/dL (23.5 mmol/L); serum sodium 134 mmol/L and serum potassium 4.3 mmol/L. Abdominal ultrasound examination showed two normal kidneys; a normal urinary tract and presence of peritoneal fluid. In view of these findings a bladder rupture was suspected and was confirmed by cystoscopy. With bladder drainage serum creatinine diminished to 3.5 and then 1.4 mg/dL (309 to 123.7 µmol/L). Laparotomy was done and a 4 cm tear on the dome of urinary bladder was operated. All three patients had similar histories: 1. an alcoholic binge. 2. a trauma. 3. sudden onset of abdominal pain and progressive distension. 4. anuria. 5. elevated serum creatinine. 6. cystography revealing a tear in bladder. 7. improvement in serum creatinine on continuous bladder drainage. The data of these patients were given in supplementary table.

**Results:** In the majority of bladder ruptures there is a history of significant abdominal trauma. Following heavy alcohol intake the distended bladder is very susceptible to injury and can be ruptured by a minor trauma. Alcohol induced polyuria and impaired sensorium that removes cues for voiding cause overdistension of bladder and rupture. The intoxicated patient may fail to recall the trauma. In a review of 20 isolated intraperitoneal bladder ruptures; the mean time between presentation and diagnosis was 5.4 days (3). The diagnosis was based on a compatible history; supra pubic pain; anuria; haematuria and rapidly increasing ascites. The diagnosis was strengthened by rapidly raising serum creatinine without features of hypercatabolism. Continuous bladder drainage normalized laboratory abnormalities. Urinary bladder injuries after blunt or penetrating trauma are rare; owing to its anatomical position (4) Bladder ruptures can be extraperitoneal; intraperitoneal or both; depending on the site of injury. Intraperitoneal bladder ruptures are usually associated with blunt abdominal trauma (excluding iatrogenic causes) and unlike extraperitoneal leaks they are not usually associated with pelvic fractures. Intraperitoneal ruptures usually occur at the dome of the bladder in contrast to extraperitoneal leaks which are most often lateral (4). Non traumatic rupture is even rarer and causes may be essentially divided as increase of intravesical pressure or weakening of the bladder wall. In most cases; spontaneous rupture occurs in presence of a urothelial neoplasm or after pelvic radiation therapy (2). In neonates peritoneal entry of urine is a rare complication. The major causes are congenital obstructive uropathy with urine leakage into the peritoneal cavity and bladder perforation as a complication of umbilical artery catheterization (5). The expression 'reverse peritoneal dialysis' was first used in 1991 (5). It is characterized by a flux of small molecules such as creatinine and urea from urine collected in the peritoneum along a concentration gradient opposite to conventional peritoneal dialysis where small molecules move from blood to peritoneal cavity; a phenomenon mentioned as 'reverse auto peritoneal dialysis'.

**Conclusions:** As a result the blood values of creatinine and urea are elevated mimicking renal failure despite normally functioning kidneys. This was described as 'pseudo acute renal failure’ in the literature.

**Correspondence:** Dr. Ram R, Sri Venkateswara Institute of Medical Sciences, Tirupati.

Email: ram_5_1999@yahoo.com
Effectiveness Of An Interventional Package On Quality Of Life Of PD Patients

Bindhu Mathew, Ramachandra; Gokulnath.

Department Of Nephrology, St. John's Medical College; Hospital, Bangalore

Background: Quality of life is regarded as the most important measure of treatment outcomes. Chronic kidney disease stage 5 and its management in the form of RRT even though is life saving; it has a profound impact on the quality of life. Exercise has shown to have a beneficial effect in terms of reduction of cardiovascular risk; maintenance of muscle strength; flexibility; endurance and thus improves the physical functioning.

Aim Of The Study: 1. To assess the quality of life in peritoneal dialysis patients at the base line. 2. To compare the quality of life between intervention and control group after the intervention.

Methods: After obtaining the Ethical clearance and administrative permission; the subjects were identified according to inclusion criteria. 30 patients; who were undergoing the peritoneal dialysis were enrolled in the study (15 in exercise group and 15 in control group). Baseline quality of life was assessed using the standard SF 36 scores in both groups. Baseline variables like age; diabetes; duration of peritoneal dialysis; socio economic strata was matched between the two groups.

Results: The interventional package was administered to intervention group after counseling them on the importance of exercise and dietary modifications. They were taught to do exercises and Yoga by a single trained nurse to these dialysis patients based on there physical ability with the help of a video and a booklet. They were monitored for blood pressure before and after the intervention. Patients were asked to practice these interventions at home and maintain a log. The quality of life was again assessed after one month for both the groups using S F 36 scores. Mean age in intervention group was (43.4 ± 4 yrs) and was comparable to control group (41.8 ± 5 yrs); Males were predominant in both the groups (intervention group = 84% and control group = 92%). Mean duration of dialysis was comparable between the two groups (intervention group = 24±14 months and control group = 28±10 months). 78% of patients in intervention group and 65% in control group were diabetics. There was no drop outs post intervention. The Baseline overall quality of life of intervention group and control group was 56.68 ± 8.72 and 52.37 ± 13.44 respectively and were comparable. The quality of life after one month after intervention was 69.47 ± 13.63 in intervention group and 51.11 ± 17.89 in the control group. There was a statistically significant improvement in the quality of life in exercise group (p< 0.001).

Conclusions: 1. The interventions like counseling; exercise; Yoga and dietary advice has a beneficial effect on the quality of life in peritoneal dialysis patients. 2. These interventions are feasible to be implemented in dialysis units and without any adverse effects.

Correspondence: Dr. Gokulnath, Department of Nephrology, St. John's Medical College; Hospital, Bangalore.

Email: gokulnath.neph@gmail.com

Influence Of Dietary Protein Intake On Clinical Outcomes Of PD Patients

Archana Sinha, Narayan Prasad; Amit Gupta; Dharmendra Bhaduria; Anita Saxena; Anupam Kaul; R.K. Sharma

Department of Nephrology, Sanjay Gandhi Post Graduate Institute of Medical Sciences
**Background:** Protein–energy malnutrition is common and highly prevalent in PD patients. Low protein intake may be associated with increased risk of mortality and peritonitis in these patients. Impact of initial dietary protein intake on various clinical outcomes has not been widely studied in Indian PD patients.

**Aim Of The Study:** We undertook this study to evaluate the influence of initial dietary protein intake on various clinical outcomes in PD patients.

**Methods:** Nutritional status of the patients was assessed using SGA; biochemical parameters and 72 hour diet diary. Dialysis adequacy parameters; peritoneal transport characteristics; residual renal function (RRF); and comorbid diseases were also recorded. Patients were classified into three groups based on dietary protein intake. Group1: lower tertile (Dietary protein intake <0.67 g/kg/d) Group1: middle tertile (Dietary protein intake 0.67-0.89 g/kg/d) Group1: high tertile (Dietary protein intake ≥ 0.90 g/kg/d) Various clinical outcomes were then compared between these groups.

**RESULTS:** Three hundred and fifty four PD patients (189 diabetics; 260 male; age 53 ± 13 years) were followed for 21.4±12.8 months. Based on SGA; 85/354 (24%) had normal nutritional status; 243 (68.6%) had mild to moderate malnutrition; and 26 (7.3%) had severe malnutrition. Patients in lower protein intake tertile had significantly lower SGA score (3.6±1.5 vs 4.4±1.5 vs 5.0±1.6; p<0.001); lower serum albumin( 2.9±0 vs 3.3 ± 0.4 vs 3.4± 0.4; p<0.001); lower NRI score (86.7±8.7 vs 90.7±7.7 vs 93.6±6.9; p<0.001); lower GFR ( 8.3±3.6 vs 8.8±2.8 vs 9.6±2.9; p=0.003); lower mean daily energy intake ( 13.8±3.5 vs18.5±3.4 vs 24.0±5.2; p=0.001); lower urine output ( 485.8±429.8 vs 630.2±452.1 vs 782.7±485.9; p<0.001); but higher no of malnourished patients ( 93% vs 77% vs 57%); higher percentage of patients with peritonitis ( 66.4% vs 45.2% vs 43%; p<0.001); more hospitalization ( 1.4±1.4 vs 0.9± 1.0 vs 1.0±1.1; p=0.003) and significantly more no of deaths (37.1% vs 31.5% vs 17.3%; p=0.001) compared to patients in middle and high tertile. The hazard ratio for risk of mortality in lower tertile patients was significantly higher [HR 1.9 (95% CI 1.1 - 3.3; p=0.016] compared to high tertile (reference category). The relative risk of mortality was significantly high in lower [OR 2.1 (95% CI 1.3-3.4); p=0.001] and middle tertile [OR 1.8(95% CI 1.1-2.9); p=0.009] compared to high tertile. On Kaplan–Meier analysis; patient survival (patient months) was significantly inferior in lower tertile [34.4 (95% CI 30.4-38.3)] and middle tertile [40.8(95% CI 34.8-46.9)] compared to high tertile [47.1(95% CI 40.5-53.6)] P=0048. The relative risk of developing peritonitis was also high in lower tertile group [RR 1.4(95% CI 1.2-1.9)p=0.001] compared to high tertile. On logistic regression the odd ratio of developing peritonitis was high in lower tertile [OR =2.6(95% CI 1.53-4.5); P<0.001] compared to high tertile as reference category.

**Conclusions:** Increased risk of mortality and peritonitis in our patient population. The protein intake of >0.9 g/kg/day was associated with relatively good nutritional status and favourable clinical outcomes.

**Correspondence:** Narayan Prasad, Additional Professor Of Nephrology, SGPGIMS, Lucknow

Email: narayan@sgpgi.ac.in; narayan.nephro@gmail.com

**Analysis Of Peritoneal Membrane Transport Characteristics In Indian Patients Using Peritoneal Equilibration Test (Pet)**

S. Booma Devi, R. Balasubramaniyam

Department of Nephrology, K.G. Hospital, Coimbatore

**Background:** The Peritoneal equilibration test (PET test) is an important component of PD prescription. This test proposed by Twardowski et al dates back to 1987 and is universally followed. It is well known that the peritoneal
membrane behavior is not the same universally and Twardowski himself suggested the need for individualized PET profile analysis for every center. Unfortunately very few centers have defined their profiles. No data is available from India.

**Methods:** In this study we retrospectively evaluated the PET values for glucose and creatinine at 2nd and 4th hour towards defining the PET profile for Indian patients. 448 PET values were studied from 181 patients who fulfilled the inclusion criteria. 181 patients had single test, 110 patients had two tests, 69 patients had three tests, 43 had four tests, 23 had five tests, 11 had six tests, 6 had seven tests and 5 had eight tests performed during their follow up. Data was compared to the standard PET values. SPSS software package 17 was used for analysis, 'p' value < 0.05 was considered significant.

**Results:** The overall mean and SD for these tests at 2nd and 4th hour for creatinine were 0.46 + 0.14 and 0.63 + 0.13 and for glucose it was 0.61 + 0.14 and 0.45 + 0.11 respectively. These corresponding values from the standard Twardowski PET tests at 2nd and 4th hour were 0.48 and 0.65 for creatinine and 0.57 and 0.38 for glucose. Comparison between the mean values from our study population to that of the standard test was done by the one sample student 't' test that revealed a significant difference in all the four values 0.46 & 0.48, (p = 0.04) and 0.63 & 0.65 (p = 0.001) for creatinine at 2nd and 4th hour and 0.61 & 0.57 (p=0.00) and 0.45 & 0.38 (p= 0.00) for glucose. This indicate that Indian PD patients are slow transporters compared to that of the Twardowski’s patient population.

**Conclusions:** We suggest using our transport profile values for defining PET status in Indian PD population.

**Correspondence:** Dr. R. Balasubramaniyam, Chief Nephrologist, K.G. Hospital, Coimbatore.

Email: kidneydr@kggroup.com