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(A Journal of continuing education in kidney diseases)

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ABBREVIATIONS

Angstrom	A
body surface area	BSA
body weight	body wt.
centimeter	cm
celius	C
complement components	C1,C2,C3
Correlation coefficient	r
creatinine clearance	Ccr.
curie (s)	Ci
Equivalents	Eq
Fahrenheit	F

Glomerular filtration rate	GFR	normal (concentration)	N
gram (s)	g	not significant	NS
Grams per cent	g/100mi	optical density	OD
half-time	tf1/2	osmole (s)	Osm
hour (s)	hr	probability	P
inch	inch	second (s)	sec
International Unit (s)	IU	standard deviation	SD
Intramuscular	im.	standard error	SE
intraperitoneal	i.p.	standard error of the mean	SEM
intravenous	i.v.	ultraviolet	UV
inulin clearance	Cl _{in}	unit (s)	U
Kilogram (s)	Kg	volt	V
liter (s)	L		
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Preoperative Detection of Location and Number of Renal Stone: the Role of Diagnostic Ultrasound

MUSTAQUIMBILLAH¹, AHMEDHOSSAIN¹, MORSHIDA BEGUM¹, AFMNURULLAH¹, KAZIMD. ALAM²

Abstract:

This cross sectional study was carried out to establish the diagnostic usefulness of ultrasonography in preoperative detection of location and number of renal stones. This study was conducted on the patients who were referred to Department of Radiology and Imaging, DMCH with a clinical suspicion of nephrolithiasis. In this study a total of 73 stones were detected in the 34 cases by USG, of which 13 found in upper calyx region, 18 in middle calyx region and 42 found in lower calyx region. Peroperative finding of these 34 cases were; a total 69 stones were found, of which 12 in upper calyx region, 17 in middle calyx region and 40 in lower calyx region. Analyzing the total number of renal stone detected by USG; the sensitivity for stone detection in the upper calyx region was 91.67%, middle calyx region 88.33% and in the lower calyx region was 95% and specificity was 96.72%, 94.64% and 87.88% respectively. It can be concluded that USG is easily available and cheap, bedside non invasive, non-ionizing diagnostic tool for accurate evaluation of renal stone.

Key Words: Renal stone, upper calyx region, middle calyx region, lower calyx region.

(Bang. Renal J. 2007; 26(2): 40-42)

Introduction:

The diagnosis of nephrolithiasis can be established in a variety of ways. Most commonly, renal calculi are detected on plain radiographs of the abdomen. Computed tomography is also an excellent, although expensive, means for detecting both radio opaque and radiolucent stones¹. Sonography is another method for detecting renal calculi. Ultrasound can diagnose reliably renal stone which can be seen as highly echogenic foci with distal acoustic shadows. Calculi within the calyces and renal pelvis can be seen easily². Certain entities may mimic renal calculi sonographically, including (1) intrarenal gas, (2) Renal artery calcification (3) Calcified sloughed papilla (4) Calcified transitional cell tumour (5) alkaline- encrusted pyelitis and (6) calcification of the end of a ureteric stent³. Ultrasound gives additional features such as effects of obstruction. It demonstrates hydronephrosis which is seen as dilatation of PC systems. Ultrasound has the advantage of subjecting the patient not to ionizing radiation and has been recommended as the initial choice in the investigation of calculi in children⁴. The purpose of this study is to determine the accuracy of ultrasound in detecting of the location and number of renal stone.

Methods and material:

This cross sectional study was carried out in the Department of Radiology and Imaging in collaboration with department of Urology, DMCH. This study was conducted on the patients who were referred to Department of Radiology and Imaging, DMCH with a clinical suspicion of nephrolithiasis. Patients were scanned by real-time US machine fitted with 3.5 MHz linear convex probe. No preparation was taken except optimally filled urinary bladder. All patients were scanned in supine, right lateral, left lateral and prone position. Longitudinal and transverse scan of both kidneys were performed to evaluate the length, width, cortical echogenicity, sinus echo, corticomedullary differentiation of both kidneys. If any stone (bright echogenic structure casting distal sharp acoustic shadow) found; the location and number was noted. Any other pathology such as PCS dilatation, mass lesion or cyst was looked for and recorded if present. One hundred patients were detected as nephrolithiasis during the study period. These patients were followed up and among them 34 patients undergone nephrolithotomy. These 34 patients were taken as sample of this study. The

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following operational variables were studied: age, sex, abdominal pain, UTI, haematuria, nausea, vomiting, sonographic and peroperative number and location of stones. upper calyx region was defined as the part of the kidney belongs to upper major calyx, mid calyx region as the part of the kidney belongs to middle major calyx, lower calyx region as the part of the kidney belongs to lower major calyx. All these information were recorded in a pre designed data collection sheet and were checked and coded manually. The data were analyzed by the help of computer using the SPSS. Sensitivity, specificity, accuracy, PPV, NPV of sonographic findings for the diagnosis of renal stone were calculated.

Results:

Among the 34 cases, 28 were male and 6 were female. The age range of the cases was 5 years to 61 years, maximum proportions of the respondent belonged to fifth decade. Among the subjects abdominal pain was the leading (70.5%) symptom (Table-I). In this study a total of 73 stones were found by USG in 34 cases, of which 13 in upper calyx region, 18 in middle calyx region and 42 in the lower calyx region. Out of these 73 stones, 69 were found at operation; 12 in upper calyx region, 17 in middle calyx region and 40 in lower calyx region (Fig- 1).

Table-I

Presenting complaints of the patients with renal stone disease

Complaints	Number	Percent (%)
Abdominal pain	24	70.58
UTI	13	41.17
Haematuria	8	29.41
Nausea	6	11.76
Vomiting	5	11.76

In this study 23 of 34 cases the ultrasonographic preoperative description of both location and number of renal stone were found concordant with the peroperative finding. In the remaining 11 cases despite ultrasonographic detection of renal stone no stone were found per operatively. Detection of location of stones was not correct in two cases and sonographic counting of stone number was incorrect in 11 cases.

At USG, in two cases stones were overlooked at middle calyx region. Stones were counted fewer than the number of preoperative stone in 7 cases and counted more in 4

cases. In one case a single large staghorn calculus was counted as 3 stones

Analyzing the total number of renal stones found by USG and that by surgery the sensitivity, specificity, PPV, NPV and accuracy of the sonographic finding of upper calyceal stone was 91.67%, 96.72%, 84.61%, 98.33%, 95.89% respectively. For middle calyx region stone: sensitivity 88.33%, specificity 94.64%, PPV 83.33%, NPV 96.36%, accuracy 93.15%; and for the lower pole stone: sensitivity 95%, specificity 87.88%, PPV 90.47%, NPV 93.54%, accuracy 91.78%.(Table-II).

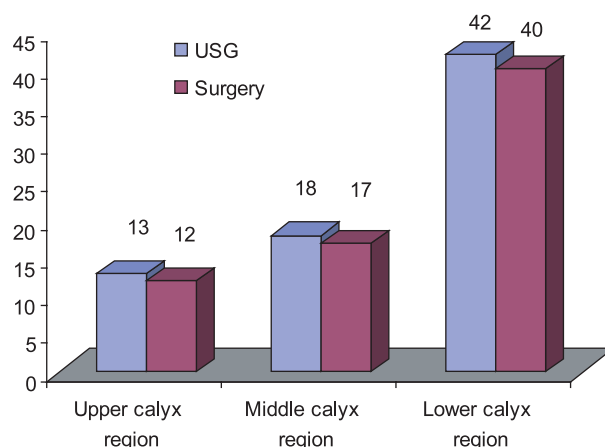


Fig.-1: *Distribution of the renal stones found in USG and surgery.*

Table: II

Validity of ultrasonographic detection of renal stone compared to surgery:

Validity tests	Upper calyx region	Middle calyx region	Lower calyx region
Sensitivity	91.67%	88.33%	95%
Specificity	96.72%	94.64%	87.88%
Positive predictive value	84.61%	83.33%	90.47%
Negative predictive value	98.33%	96.36%	93.54%
Accuracy	95.89%	93.15%	91.78%

Discussion:

This cross sectional study was carried out in the Department of Radiology and Imaging DMC on selected 34 patients of nephrolithiasis. All of the 34 cases underwent preoperative abdominal ultrasound. In this study maximum proportion of the respondents belonged to fifth decade.

In a study Blacklock⁵ also showed that the peak age for renal stone was in the third to fifth decade. Male predominated 28(82%) among the renal stone disease patients of this study where as female constitute only 6(18%). Blacklock⁵ in his study showed about three males are afflicted for every female. Koran⁶ also showed renal calculi are three times more common in male.

Among the respondents about 24 (71%) gave the history of abdominal pain in the form of renal colic or fixed abdominal pain. Fowler⁷ mentioned abdominal pain as the leading symptoms in 75% of people. The study by Smith SL et al⁸ showed abdominal pain as the most common symptoms (60%) of renal tract calculus. Urinary tract infection is the next common symptom presented by the patients (41%). Presence of infection is a common association of renal tract calculi⁶. In another study by Kenny IJ et al⁹, on 638 patients they also showed urinary tract infections as a common association of renal tract calculus.

In this study sonographic count of stone number when compared to stone count by surgery the sensitivity of sonographic finding for upper calyx region was 91.67%, middle calyx region was 88.33% and lower calyx region was 95%.

Middleton WD et al² in their study showed the sensitivity of US in the diagnosis of renal calculi is 96%. The sensitivity in upper calyx region was 93%, in the middle calyx region 94% and in the lower calyx region 98%. The specificity of USG for detecting stone was 89%.

In a study by Vrtiska et al¹⁰ the sensitivity was found 93%. Another study by Diament and Malak Zadah¹¹ on thirteen children showed 84% sensitivity. In a study by Pollack HM et al¹² they showed that all radiolucent calculi were detected by USG.

Another study by Fowler et al¹³ showed that USG depicted 24 of 101 calculi identified at CT, yielding a sensitivity of 24% and a specificity of 0%. The sensitivity of USG for any calculi in a patient was 44%. USG enabled identification of 39% of patients with multiple calculi and demonstrated all calculi in 17% of these patients.

In this study, as expected, stone detectability was affected by stone size as well as body size. It is well known that the obese patients are generally less well suited for USG than patients of normal body size. Although the effects of obesity were minimized, it was recognized that it cannot be eliminated completely and that there will certainly be patients in whom USG is unsuccessful as a result of

obesity. However the success in identifying the location and number of renal stone in this study with USG might lead others to attempt to examine patients of renal colic with USG.

Conclusion:

It can be concluded that for accurate detection of renal stones USG is an easily available, cheap, bedside, non invasive, diagnostic tool without any risk of exposure to radiation. The limitation of this study is relatively small sample size. A larger study will be more helpful to evaluate the role of diagnostic ultrasound in pre operative detection of the location and number of renal stone.

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Use of Stent in Lower Ureteric Stone Treatment with Ureterorenoscopic Intracorporeal Pneumatic Lithotripsy

MA SALAM, M HOSSAIN, MS ISLAM, ATM AMANULLAH, S RAHMAN, AKMK ALAM

Abstract

Ureterorenoscopy and intracorporeal lithotripsy have become a highly effective, minimally invasive treatment for ureteric calculi. But efficacy of stent use in all cases to reduce the morbidity is still a controversy. With the aim to see the matter a prospective comparative study was carried out at the department of Urology, BSMMU, Dhaka. Sixty adult (18-60yrs) patients undergoing uncomplicated ureteroscopic pneumatic lithotripsy for the treatment of ureteral calculus were randomly selected to group A (stented) and group B (nonstented) with thirty in each group. They were assessed for success rate and post operative morbidity. In group A and B the procedure was successful in 28 of 30 (93.3%) and 27 of 30 (90%) patients respectively. The success rate was not statistically different with or without a ureteral stent. But in this study all the post operative morbidity was significantly low in nonstented group than in stented group. So, this study does not support the view that stent use is associated with more success rate and less morbidity. Further studies with larger number of sample are needed to draw a definite conclusion.

Key words:

(Bang. Renal J. 2007; 26(2): 43-46)

Introduction

Ureterorenoscopy and intracorporeal lithotripsy have become a highly effective, minimally invasive treatment for ureteric calculi¹.

There are definite advantages of stenting in management of ureteric stone. However, stent use is not without complications and in most cases increases morbidity. Moreover, ureteral stents add some expense and time to the overall procedure of ureteroscopy and a secondary cystoscopy is required for stent removal. With the use of caliber endoscopes and lithotripsy devices, ureterorenoscopy in majority of cases may be done without ureteral dilatation, making the procedure relatively less traumatic. As a result questions arise and get voice whether routine stent placement is essential after uncomplicated pneumatic ureteroscopic lithotripsy².

It should be remembered in choosing therapy for urolithiasis that the idea is not just to use the machine, idea is to treat the patient safely, effectively, economically and with minimal complications. To accomplish this goal the urologist should be able to recognize when not to use a stent after ureteroscopic intracorporeal pneumatic lithotripsy³.

This study is designed to evaluate and compare randomly selected groups of patients undergoing pneumatic ureterorenoscopic lithotripsy with or without stent

placement after the procedure. It is the effort of the study to determine whether stents may be omitted after uncomplicated pneumatic ureteroscopic lithotripsy for ureteral stones, which would eliminate stent related symptoms and morbidity and improve patient satisfaction with ureteroscopic lithotripsy.

Materials and methods

This was a hospital based prospective randomized controlled trial carried out in the department of urology, Bangabandhu Sheikh Mujib Medical University (BSMMU), from July, 2006 to December, 2007. All adult patients age above 18years, admitted in urology ward with lower ureteric stone from .05cm to 1 cm size without any previous history of ureteric surgery and planned for URS+ICPL were randomly selected during the operation. Patients with anomalous ureter and pregnancy were excluded from the study. The sample was grouped as Group A: Ureteric stone treated with URS+ICPL and a double J stent Group B: Ureteric stone treated with URS+ICPL without a stent and 30 cases in each group.

Under anesthesia the patient was placed in modified lithotomic position with the leg opposite the involved ureter while the ipsilateral leg abducted. Initial cystoscopy was a routine procedure to every patient to locate the ureteric orifice and to negotiate a guide wire above the stone and pushed up to renal pelvis and kept in situ.

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After removing the cystoscope an 8 Fr baby feeding tube was introduced to urinary bladder for continuous drainage. Then a 34 cm 9.8 Fr semi rigid ureteroscope was introduced to the ureter under direct vision. The presence of the guide wire gives a good orientation about the position of the ureteric orifice. After entering the ureter location of the stone was ensured. Then intracorporeal pneumatic lithotripsy was done using a 1mm probe through the central working channel of semi rigid ureteroscope. On completion of the procedure stone fragments were removed by stone grasping forceps. During the procedure, if any complications occur such as injury, perforation or any difficulty, were stented and excluded from the study.

Uncomplicated cases following ureteroscopic intracorporeal pneumatic lithotripsy were stented or nonstented randomly. All the patients were catheterized with a biluminal 14-16 Fr Foley's catheter for 24 hours. A double J ureteral stent (6 Fr.) was placed in the treated ureter of group A (stented group) patients.

All the patients having complications were undergone proper evaluation and management. Uncomplicated patients were discharged on 3rd post operative day. In patients randomized to the stented group the ureteral stent was removed after 4 weeks by cystoscopy under local anesthesia.

The follow-up period in this study was 3 months. All patients were then followed 1, 4, 6 & 12 weeks post-operatively. All the 60 patients were followed up as per schedule. Patients were seen in outpatient department and in urology OT for followed-up. In the followed-up study, history taking, clinical examination and relevant

investigation were done and data on post-operative pain and post-operative complications i.e. haematuria, urgency, frequency, dysuria and stone clearance were recorded and statistical analysis was performed where probability (p) value of <0.05 was considered as significant.

Success was defined as the complete removal or radiographic absences of calculi at follow up.

Limitations-

Long term follow up was not done in this study to see the number of ureteral stenosis in stented and non stented group of patients.

Observation and results

In group A, mean age was 34.6 ± 13.03 (18-60yrs). In group B, mean age was 35.03 ± 12.05 (20-58 yrs).

On comparison of stone clearance between the groups, total clearance of stone occurred in 28 cases in group A (93.3 %) and in 27 cases in group B (90%). Although rate of clearance is higher in group A, it was not statistically significant (P value > 0.05) (Table-I).

Post operative loin pain and lower abdominal pain was more common in the stented group than the nonstented group. In group A (Stented group) post operative haematuria was more (26.7%) than group B (Nonstented group) (6.7%). Postoperative dysuria more in group A (33.3%) than group B (6.7%). Postoperative urgency also more common in the stented group (40%) than nonstented group (10%). Postoperative frequency of micturition also more common in the stented group (40%) than nonstented group (13.3%) and all these post operative morbidity was significantly higher in group A patients (P < 0.05). (Table: II)

Table-I

Comparison of clearance of stones among the groups.

Groups	Cleared		Not Cleared		χ^2	P
	No. of patients	Percent	No. of Patients	Percent		
Group A	28	93.3(%)	2	6.7(%)	0.218	>0.05
Group B	27	90(%)	3	10(%)		

Table-II

Percentage of postoperative complications among the groups.

Post operative complications	Group A(%)	Group B(%)	χ^2	P
Flank pain	33.3	10	4.8	<0.05
Lower abdominal pain	26.7	6.7	4.32	<0.05
Haematuria	50	13.3	9.3	<0.01
Dysuria	33.3	6.7	6.64	<0.01
Urgency	40	10	7.2	<0.01
Urinary frequency	40	13.3	5.44	<0.05

Discussion

Stents have been used for more than 30 years in the treatment of renal and ureteric calculi. The stent is generally placed if there is accompanying ureteric injury or in those with a residual stone after ureteroscopic lithotripsy. Ureteral stent placement after ureteroscopy for urinary calculi is a common practice, as demonstrated by its high frequency in large series (83% to 100%)⁴. The rationale for ureteral stent placement traditionally has been that it may reduce stricture formation and renal colic secondary to ureteral obstruction. However, indwelling ureteral stent may have a deleterious effect on patient's urinary system⁵.

This study expanded on the idea of selective ureteral stent placement for ureteric stone. Patients were grouped after surgery. Demographic profile of patients in this study corresponds to some other studies of ureteric stone at home and abroad^{4, 6}.

In the present study, it was observed that 22 patients (73.3%) had stone size <1 cm and 8 patients (26.7%) had stone size of 1cm in group A. In group B, 20 patients (66.7%) had stone size < 1cm and 10 patients (33.3) had stone size of > 1cm. In the study by Kumar et al. (1994) average stone size was 115±32 mm on group A and 117 ± 29 mm in group B⁷. Another study held at BSMMU showed stone size < 1cm in about 56 % cases and < 1cm in 44% cases⁸. The distribution of stone size of this study nearly correlates well with the present series.

Distal ureter contain stone in 20 cases (66.7 %) in group A and in 18 cases (60%) in group B. Mid ureter contain stone in 6 cases in group A and in 8 cases in group B. Proximal ureter contain equal number of cases , 4 patient in each group. A Brazilian study showed that among their cases distal ureter contain 77.45 % and 82.7% in stented and nonstented group⁹. Site of stone were mostly in the distal ureter in our study (63%).

Ureteroscopic access was successfully achieved in all cases without the need for ureteral orifice dilatation. In group A and B the procedure was successful in 28 of 30 (93.3%) and 27 of 30 (90%) patients respectively. The success rate was not statistically different with or without a ureteral stent. Success rate were similar in both group according to various studies^{2, 9}.

Several randomized studies have evaluated pain and voiding symptoms in patients who were either stented or not stented after uncomplicated ureteroscopic lithotripsy^{5,6,7}. In this study, post operative flank pain were significantly higher in stented group (33% Vs 10%, p<0.5%). Post operative lower abdominal pain was also

more in stented group than the nonstented group (26.7% Vs 6.7%, p<0.5%). In a randomized study with 58 patients with stented or nonstented group following ureteroscopy, patients were evaluated shortly before their stent removal and had significant flank pain, abdominal pain, dysuria and urinary frequency compared with those who had not been stented². In another multi center randomized study that demonstrated significantly more postoperative flank pain, bladder pain, lower urinary tract symptoms and overall pain in stented compared to nonstented patients following ureteroscopy¹⁰. These findings well correlate to that of our findings, demonstrating significantly more postoperative pain in stented group. In contrast, other study reported that nonstented patients had more suprapubic discomfort compared with stented group on the first postoperative day. This finding was reversed by postoperative day 6, when stented patients developing significantly more suprapubic discomfort than their nonstented counterpart¹¹. Some other study reported no difference in postoperative pain between stented and nonstented group^{12, 13}. It is obvious from different studies that, postoperative pain is significantly more in stented group or at least equal in both groups.

Overall postoperative urinary complain was more in stented (15 cases, 50%) than the nonstented group (4 cases, 13.3%). It is also high in comparison to some studies and corresponds to some other studies¹⁵. There are several reports suggesting that stent placement may be associated with significant symptoms and the symptom persist until the stent is removed although operative time and cost were significantly more in the stented group^{1,9,12,16,17,18}.

Uncomplicated ureteroscopic lithotripsy for treatment of distal ureteric calculi can be safely performed without placement of ureteral stent. Patients without stents have significantly less flank and lower abdominal pain, haematuria, dysuria, urgency and frequency compared to those with stents.

This study showed that use of ureteric stent in the management of ureteric stone by ureterorenoscopic intracorporeal pneumatic lithotripsy is associated with more complications without any difference in the success rate. Thus this study does not support the view that stent use is associated with more success rate and less morbidity.

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Pruritus in Chronic Kidney Disease: A Frustrating Symptom

DILIP KUMAR ROY

Summary:

Pruritus is a manifestation of chronic kidney disease and not observed in uremic patients due to acute kidney injury. Pruritus causes skin damage, discomfort, sleeping disorders in patients of CKD who already has a compromised life style. Although, not a life threatening condition; however, it is known to adversely affect the quality of life of these patients. The prevalence of pruritus in CKD patients varies substantially from 22-90% in different studies. The pathophysiological mechanism of CKD associated pruritus remains poorly understood. Activation of proinflammatory cytokines and imbalance in the endogenous opioidergic system received recent attention in the pathophysiology of CKD associated pruritus. There are a myriad of proposed therapeutic alternatives for the management of CKD associated pruritus, including optimization of dialysis therapy, use of biocompatible dialysis membrane, improvement of nutritional status, adequate control of plasma levels of calcium and phosphorus, treatment of hyperparathyroidism, topical therapies, systemic medical treatment, alternative medicine, surgery etc. The purpose of this article is to provide an overview of proposed pathophysiological mechanisms of pruritus in CKD, and to discuss the alternatives for its treatment in the setting of advanced renal failure

Key words: Chronic Kidney Disease, Pruritus.

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Introduction:

Among the many skin alterations associated with advanced chronic kidney disease (CKD) pruritus is one of the most common and frustrating symptoms for both the patients and the clinicians.^{1,2,3} Pruritus is an unpleasant sensation and subjective experience that is difficult to evaluate. Itching in chronic kidney disease patients is popularly known as uremic pruritus. To many authors this term is misleading as there is no true cause effect relationship of itching with uremia.^{4,5} Pruritus is a manifestation of chronic kidney disease and not observed in uremic patients due to acute kidney injury. So, possibly the best term to describe this pruritus is CKD associated pruritus or CKD associated itch.

CKD associated pruritus of itself, not a life threatening condition; however, it is known to adversely affect the quality of life of the patient. Pruritus is not observed in acute renal failure and in CKD does not necessarily subside with dialysis although it improves with kidney transplantation.³ Pruritus causes skin damage, discomfort, sleeping disorders in patient of CKD who already has a compromised life style. Bergstorm et al⁶ showed that in this very disturbing condition an increase of attention and the sensation of being treated could be associated with subjective improvement. The pathophysiological mechanisms of pruritus are mainly unknown despite

several hypothesis are presented. Most published reports⁷⁻¹³ showed CKD associated pruritus to be independent of sex, age, ethnicity, type of dialysis and underlying renal disease. The prevalence of pruritus in CKD patients varies substantially from 22-90% in different studies.^{8, 14-17} In a large epidemiologic study, the International Dialysis Outcomes and Practice Pattern Study (DOPPS)⁸ the prevalence of CKD associated pruritus was 42%. This study evaluated more than 1800 patients on hemodialysis therapy, amongst them pruritus was associated with a 17% increase in mortality risk. The purpose of this article is to provide an overview of proposed pathophysiological mechanisms of pruritus in CKD, and to discuss the alternatives for its treatment in the setting of advanced renal failure

Neuro physiology of pruritus:

The neurophysiology of pruritus remains incompletely understood. Pruritus is thought to originate in the terminal branching of afferent non myelinated C fibers distinct from those involved with pain, located in the lower epidermis or dermoepidermal junction.¹⁸ A dedicated pruritus receptor has not yet been identified. These C fibers enters the spinal cord by the dorsal roots and ascend upwards via the contra lateral spinothalamic tract¹⁹ They reach the thalamus and hypothalamus via reticular formation²⁰ and then to the

anterior cingulate cortex, the supplementary motor area and in the inferior parietal lobe with a left hemisphere predominance.^{21,22,23} Itch has been classified into four categories:²⁴ i) Pruritoceptive – when its cause is in the skin, ii) Neuropathic – If the perturbation is located in any point along the afferent pathway, III) Neurogenic – a centrally originated pruritus, IV) Psychogenic – also central but without any detectable organic cause. Pruritus associated with CKD occurs in a setting of complex metabolic environment and does not fit perfectly in any of these specific classes.

Pathophysiology :

The pathophysiological mechanisms of CKD associated pruritus remains poorly understood. A substantial body of evidence has been accumulated in favour of the concept that chronic uremic state is a chronic inflammatory condition in which a number of pro-inflammatory cytokines are activated.^{25,26} To some extent improvement of CKD associated pruritus with, Immunomodulators like ultraviolet B light,²⁷ tacrolimus,^{28,29} and thalidomide³⁰ support its inflammatory origin. These three treatment modalities are known to decrease the production of pro inflammatory cytokines through various mechanisms. Kimmel M et al (2006)³¹ reported that hemodialysis patients with pruritus showed significantly increased helper cell type 1 differentiation as well as greater serum C reactive protein and interleukin-6 levels, which correlates with the inflammatory nature of the disease. International Dialysis Outcomes and Practice Pattern Study (DOPPS)⁸ showed that moderate to severe pruritus in patients on hemodialysis was associated with higher white blood cell count greater than $7 \times 10^9/L$. The study also showed that lower levels of serum albumin, a negative acute phase reactant, were significantly more likely to have moderate to severe itch. Pruritus in CKD may be implicated as potential marker of malnutrition inflammation atherosclerosis (MIA) syndrome, a known risk factor for death in dialysis patient.³² Poor outcome of CKD patients with associated pruritus may be explained by the association of MIA syndrome in dialysis patients.

Endogenous opioids seem to be important in the transmission as well as regulation of itch sensation. Stimulation of the μ -opioid receptor in the brain and / or peripheral nerve endings by its agonist such as morphine can cause itching^{33,34,35} Both μ -opioid agonist and κ -opioid receptor antagonists can induce itch whereas μ -receptor antagonists and κ -receptor agonists can decrease

it.³⁶ κ -opioid stimulation inhibits μ -receptor effects both centrally and peripherally.³⁴ Imbalance in the endogenous opioid system received recent attention in the pathophysiology of CKD associated pruritus. Kumagai et al (2004)³⁷ reported an increase in the ratio of μ -receptor agonist beta endorphin to a κ -receptor agonist dynorphin A in hemodialysis patients compared to healthy controls and the ratio increases with the severity of pruritus. This imbalance and over activity of μ -receptor opioid system probably has a role in CKD associated pruritus. In a double blind placebo control study Wikstrom B et al (2005)³⁸ showed that Nalfurafine, a κ -receptor agonist, significantly decreases pruritus. Substance P, a neuropeptide, has been implicated in the mediation of pain and some itch sensations. Dermal mast cells sit very close to the afferent C neuron terminals and interaction between these structures may play an important role in the mediation of pruritus.³³ The number of dermal mast cell increases in patients with CKD.^{39,40} Mast cell releases histamine, proteases, interleukin 2, and tumour necrosis factor alpha (TNF- α) Histamine and proteases have been recognized as pruritogen for long time^{41,42} Histamine induced pruritus was significantly greater in hemodialysis patients with pruritus than non pruritic hemodialysis and healthy patients, indicating that in hemodialysis patients with pruritus there is augmented sensitivity to histamine as pruritogen.⁵ TNF- α is known to exacerbate nociception⁴³ Interleukin -2 is also pruritogenic when injected into skin.³⁹ Prostaglandins can also modulate pruritus by lowering the threshold for histamine induced pruritus.⁴⁴

The resolution of pruritus following UVB treatment was associated with a reduction of skin phosphorus to values comparable with nonpruritic uremics or healthy volunteers⁴⁵ which suggested that pruritus in CKD may be due to increased skin divalent ion content resulting in micro-precipitation of calcium or magnesium phosphate.

Microneurographic studies of human nerve fibers showed that a particular subgroup of mechanically insensitive C-fibers in human skin discharged a pattern of impulse that matched the perception of itch.²⁰ Indirect immunohistochemistry showed that hemodialysis patients with pruritus develop an abnormal pattern of cutaneous innervations.⁴⁶ The effectiveness of gabapentine,^{47,48} an anticonvulsant in the treatment of CKD associated pruritus supports a neuropathic mechanism of the symptom.

Many other factors have been implicated in the pathogenesis of itching in CKD patients. Xerosis, caused by atrophy of sweat glands and sebaceous glands, impaired sweat secretion, disturbed dermal hydration, is very

prevalent in CKD and its presence has consistently been associated with pruritus.^{16,44,49-51} Additional factors that have been inconsistently implicated as cause of pruritus in CKD includes high serum levels of parathormone,^{52,53} calcium, phosphate, magnesium,⁵⁴ aluminum,⁵⁵ α_2 - microglobulin,¹⁷ bile acid,⁵⁶ hypervitaminosis A⁵⁷ and elevated cutaneous content of divalent ions⁵⁸ etc. Finally a high prevalence of HLA-B35 was reported in patients with pruritus compared to patients without pruritus implicating genetic predisposition in the manifestation of pruritus.⁵⁹

Management

The evaluation and management of CKD associated pruritus can be challenging. Pruritus not related to CKD, like pruritus due to liver disease, primary skin disease (e.g., atopic dermatitis, contact dermatitis, psoriasis, urticaria etc) and endocrine disorder (Graves's disease, hypothyroidism, and diabetes mellitus) must be diagnosed before leveling the pruritus to CKD. Most of the recommendations regarding the treatment of CKD associated pruritus are not firmly evidence based. There are a myriad of proposed therapeutic alternatives, including optimization of dialysis therapy, use of biocompatible dialysis membrane, improvement of nutritional status, adequate control of plasma levels of calcium and phosphorus, treatment of hyperparathyroidism, topical therapies, systemic medical treatment, alternative medicine, surgery etc.

Modification in the dialysis procedure: Hiroshige K et al (1995)⁶⁰ analyzed data on 59 hemodialyzed patients who did not have significant disorders of calcium and phosphate metabolism and found that more than 60% suffered from disabling pruritus. They showed that significant increases in dialysis efficiency as measured by Kt/V_{urea} were associated with significant reductions in the pruritus intensity and concluded that higher dialysis efficacy with good nutritional state reduces the prevalence and degree of pruritus in hemodialyzed patients. Low-magnesium dialysate (0.4mEq/L) was reported to be beneficial in patients with CKD associated pruritus.⁶¹ Kyriazis et al (2000)⁶² reported improvement of pruritus in patients treated with low Ca dialysate (<2.5mEq/L). But these findings need to be confirmed by larger well controlled trials.

Topical treatment: Emollients, also referred to as skin moisturizing cream usually represent the first line of treatment especially when a component of dry skin is found in clinical evaluation. Although there were contradictory

reports regarding relationship between the degree of xerosis and pruritus,^{51,63} an increase in water content of the stratum corneum after emollient application may be clinically important in pruritus associated with CKD. Emollients do not have a uniform composition but simple emollients that do not contain perfumes or other additives are preferable.

Capsaicin (trans-8-methyl-N-vanillyl-6-nonenamide), a natural alkaloid found in the chili pepper plant (genus capsicum) has been reported to be effective in the treatment of pruritus in CKD.^{64,65} Topical capsaicin depletes and prevents the reaccumulation of substance P in peripheral sensory neurons. Substance P functions in the transmission of pain and probably itch sensations. In a cross over double blind control trial⁶⁶ application of 0.025% capsaicin cream significantly alleviated pruritus without any adverse effects. Cost may represent a limiting factor for widespread use, especially in generalized pruritus of CKD.

Tacrolimus, a calcineurin inhibitor that reduces the synthesis of interleukin-2 from lymphocytes, have anti inflammatory properties. A single center pilot study of 25 patients on chronic dialysis with pruritus showed significant reduction in the severity of pruritus by six weeks treatment with tacrolimus ointment (0.03% for three weeks and 0.1% for three weeks) without any serious side effects.⁶⁷ Pauli-Magnus C et al (2000)²⁹ reported dramatic decrease of pruritus in 3 patients on peritoneal dialysis with application of 0.03% tacrolimus ointment. But every patient relapsed after drug withdrawal. An FDA black-box warning was issued in 2006 against the prolonged topical use of tacrolimus cream and ointment, on the basis of experimental studies which showed an increased risk of skin malignancies following use of these agents.⁶⁸ Tacrolimus ointment or cream is not advised for prolonged use or as first line therapy in pruritus associated with CKD. Cost may also be a limiting factor.

Topical steroid have been prescribed because of their well known anti pruritic and anti inflammatory properties, but the absence of controlled studies and potential serious side effects, argues against the routine and prolonged use of steroid in CKD associated pruritus.

Physical treatment: Ultraviolet-B (UVB) irradiation,^{27,43,69} but not Ultraviolet-A (UVA) irradiation^{45,70} is considered by many as treatment of CKD associated pruritus. Total UVB irradiation for 2-3 minutes thrice a week has resulted in long lasting remission of pruritus.⁴⁵ Narrowband UVB is less erythemogenic⁷¹ than broad band UVB⁷² and

thus generally being accepted as a safer option. UVB improves pruritus possibly by its ability to reduce cytokine production by lymphocytes as well as inducing mast cell apoptosis⁷³

Systemic medical treatment:

The list of systemic medications reported to be beneficial in patients with CKD associated pruritus is long one and includes antihistaminic drugs,⁷⁴ Ketotifen,⁷⁵ gabapentine,⁷⁶ Opioid antagonist,⁷⁷⁻⁷⁹ leukotrine inhibitors,⁸⁰ thalidomide,⁸¹ Cholestyramine,⁸² oral activated charcoal,⁸³ ondansetron,⁸⁴ erythropoietin⁸⁵ etc.

Sedating antihistamines are commonly used in patients with CKD associated pruritus, probably exerting a beneficial effect through their soporific properties, but the response is generally disappointing.^{76,86} A beneficial effect of ketotifen in CKD associated pruritus was reported by Francos et al (1991),⁸⁷ who examined the effects of ketotifen, a putative mast cell stabilizer, on severe uremic pruritus. Five of five patients had significant ($p < 0.01$) reductions in pruritus, as judged on a six-point pruritus index, after 8 weeks of drug.

Gabapentin, a gamma-amino butyric acid analog used as an anticonvulsant, significantly reduces the severity of CKD associated pruritus when given at a dose of 100-300mg after each dialysis session.^{47,48} Renal excretion of gabapentin is decreased in dialysis patient. Manenti et al (2000)⁴⁸ suggested using a lower dose of gabapentine⁸⁸ (100 mg after each dialysis) with slow upward titration to decrease the risk of gabapentine induced nephrotoxicity and or coma in patients with decreased renal function. Other reported adverse effects of gabapentin include dizziness, somnolence, fatigue and nausea.⁸⁸

It has been shown that the opioidergic system play an important role in pathophysiological process of CKD associated pruritus. In a Meta analysis of two multicenter randomized placebo controlled trial Wilkstorm et al (2005)³⁸ showed that two weeks treatment with Nalfurafine, a κ -receptor agonist resulted in significant but modest decrease in worst itch, itch intensity and sleep disturbance compared to placebo. Continued nalfurafine treatment for 4 weeks did not alleviate "worst itch" symptom significantly more than placebo, which suggested a possible attenuation in the beneficial effects of the drug with continued use. Adverse effects of Nalfurafine on CNS include sleepiness, vertigo, insomnia, headaches drowsiness and nausea. Naltrexone an oral μ -opioid receptor antagonist, effectively reduces the severity of

CKD associated pruritus in a randomized cross over trial on dialysis patients,³⁷ but the findings are not confirmed by large placebo controlled trial.¹⁵ Butorphenol, a κ -receptor agonist and μ -receptor antagonist was shown by Dawn AG et al (2006)⁸⁹ as effective in the treatment of chronic intractable itch when administered by intranasal route. They also confirmed the successful use of butorphenol in patients with CKD associated pruritus.

Activated carbon: Which would possibly act by binding putative pruritogen in the intestinal lumen, has been shown to completely resolve or significantly reduce pruritus symptoms in patients on CKD.^{83,90} This inexpensive and well tolerated substance can be considered in the therapy resistant cases.

Beneficial effects of ondansetron, a selective 5-HT₃ antagonist although reported initially was not confirmed subsequently.^{91,92} Granisetron, another selective 5-HT₃ antagonist, was effective and well tolerated for pruritus in CKD in a small non controlled study.⁹³ Cholestyramine presumably acting in a similar way was found to improve pruritus.⁹⁴ Omega -6-fatty acid supplementation is associated with increased synthesis of the anti inflammatory prostaglandin E1 and lower production of the pro inflammatory prostaglandin E2. Yoshimoto – Furuie K et al (1999)⁹⁵ in a small study showed primrose oil for six weeks tended to improve pruritus in CKD compared to linoleic acid as control although statistical significance was not reached.

Thalidomide, an immuno modulator drug was found in a cross over, randomized, double blind, placebo controlled trial as very effective in the treatment of pruritus in hemodialysis.⁸¹ Owing to its teratogenic properties however, thalidomide should probably be reserved for individuals with therapy resistant pruritus of CKD who are not of reproductive age. The mechanism by which thalidomide ameliorates pruritus is still unknown but may be related to its ability to reduce the production and or release of mediators of inflammation.⁹⁶ Prolonged use or high dose thalidomide can cause severe polyneuropathy.⁹⁷

Bousquet J et al (1989)⁹⁸ in a crossover double blind placebo controlled trial studied the role of Nicergoline, a dopamine receptor antagonist with α - adrenergic blocker activity in the treatment of pruritus associated with CKD. Of the 15 patients with pruritus 13 showed improvement, which was complete in eight. But symptoms reappear in 24-48 hour after discontinuation of the drug. The mechanism of action of Nicergoline in controlling pruritus associated CKD is unknown. An initial report of the

beneficial effects of erythropoietin⁹⁹ in the treatment of pruritus associated with CKD was not confirmed subsequently.

Surgical treatment : In two case reports parathyroidectomy for severe secondary hyperparathyroidism, was accompanied by a marked reduction in pruritus intensity.^{53,100} Stahle-Backdahl M et al (1988)⁵¹ in their study showed correlation of PTH levels with pruritus in hemodialysis patients. Pruritus of CKD improves with kidney transplantation.³ In a dermatologic survey performed in both ESRD patients and kidney transplant patients by the same physician, the prevalence was 60% and 10% respectively.¹⁰¹

Alternative medicine:

Six patients with intractable uremic pruritus were treated with a modified acupuncture technique, the electrical needle stimulation (ENS). The results were encouraging: pruritus was drastically improved during or after ENS in several patients. A control treatment with superficial electrical stimulation was ineffective.¹⁰² A double-blind placebo-controlled randomized clinical trial¹⁰³ assessed the role of homeopathic treatment in Pruritus associated with CKD. Reduction of pruritus was statistically significant ($P < 0.05$) at every point of observation. According to the patients' own assessment, at the end of the study period, the homeopathic treatment reduced the pruritus score by approximately 49%. Responders were more frequent in the treated group with statistical significance at 30 days (0% vs 45%, $P = 0.038$).

Conclusion:

CKD associated pruritus is a relatively frequent symptom and significant public health issue. It has a profound impact on quality of life of CKD patients and is also associated with poorer patient outcomes. As the pathophysiological mechanism of CKD associated pruritus remains poorly understood, the development of specific treatment modalities of this condition remains a challenge. A variety of therapeutic options including optimization of dialysis therapy, use of biocompatible dialysis membrane, improvement of nutritional status, adequate control of plasma levels of calcium and phosphorus, treatment of hyperparathyroidism, topical therapies, systemic medical treatment, alternative medicine, surgery etc are used for the management of this condition with variable responses.

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Short Communication

Patterns of Renal Diseases in Rajshahi Medical College Hospital – A 6 years Study

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(Bang. Renal J. 2007; 26(2): 55-56)

Introduction:

The number of patients suffering from renal diseases are increasing day by day in our country. Due to availability of better medical facilities in Bangladesh, renal diseases can be diagnosed early in recent years. There is progressive rise in the number of patients with chronic kidney disease (CKD) causing more and more burden over our hospitals and health care facilities. Rajshahi Medical College Hospital (RMCH) is providing tertiary medical care facilities. The knowledge of pattern of renal diseases in RMCH will provide a picture of kidney diseases of our country to some extent. With this view, we analyzed the pattern of renal diseases among the patients admitted into Nephrology Department of RMCH during last 6 (six) years, 2001-2006. These patients have been referred from various hospitals of neighboring districts – so it will show a picture of kidney diseases in this part, especially North and South part of our country.

Method:

Data were collected from the 'Ward Register' of Nephrology Department of RMCH from 2001 to 2006 and the diseases were diagnosed on clinical and laboratory findings. History sheet of the patients were analyzed. Presenting symptoms, physical examination findings and all investigations done were recorded in a data sheet and then analyzed.

CKD is defined as kidney damage or GFR less than 60 ml/min/1.73m² for three months or more. AGN is characterized by the presence of hematuria, hypertension, edema, azotemia and non nephrotic range proteinuria (<3.5gm/day). NS was defined as proteinuria (3.5gm/day), hypoalbuminaemia, hypercholesterolemia and edema. ARF is a syndrome characterized by a rapid (hours to weeks) decline in glomerular filtration rate. Lupus nephritis means renal involvement of a SLE patient. Obstructive uropathy describes functional or pathologic damage to the renal parenchyma resulting from the obstruction anywhere along the urinary tract.

Result:

The result of the analysis shows that various types of renal patients were admitted into RMCH (Table -I). The most common renal disease is CKD - 2028 (47.84 %) out of 4239 patients. Next to CKD is glomerulonephritis (GN) / Nephrotic Syndrome (NS) - 1000 (23.59 %) cases, Acute Renal Failure (ARF) – 446 (10.52 %) cases, Acute glomerulonephritis (AGN) – 241 (5.69 %) cases, Lupus nephritis (LN) – 198 (4.67 %) cases, Obstructive Uropathy (OU) – 108 (2.55 %) cases and others – 218 (5.14 %) cases.

Among the total 4239 patients, 2544 (60.02 %) cases were male and 1695 (39.98 %) cases were female. Among the Lupus nephritis (LN), most of the cases were female, comprising 186 (94 %) cases and only 12 (6 %) cases were male. The analysis also indicates that there is gradual increase in the numbers of patients admitted into Nephrology ward. In the year 2001 total number of admitted patients were 429 and in the year 2006 it has increased to 1150.

Table-I

Showing disease distribution pattern.

SL. Disease No.	Numbers	Percent
1. Chronic Kidney Disease (CKD)	2028	47.84 %
2. Nephrotic Syndrome	1000	23.59 %
3. Acute Renal Failure	446	10.52 %
4. Acute Glomerulonephritis	241	05.69 %
5. Lupus Nephritis	198	04.67 %
6. Obstructive Uropathy	108	02.55 %
7. Others	218	05.14 %
Total	4239	100.00 %

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Discussion :

Chronic Kidney Disease is the most common form of renal diseases in our study, comprising 47.84 % of cases attending RMCH for treatment. This is similar to other studies. Rahman et al (1983) showed that in IPGMR, chronic renal failure was the commonest renal disease, comprising 47 % of all cases¹. Another study also showed that CRF comprises 44.50 % cases².

AGN comprises 5.59 % cases in our analysis. This is much lower than the 31.50 % AGN cases in the study of MZ Kabir et al². The number of AGN were more in the study of MZ Kabir et al, because they included the patients of Nephrotic syndrome (NS) in AGN. (As various presentation of GN)

ARF is an important renal disease causing morbidity and mortality in our country. Most of the community acquired ARF is fully reversible provided facilities for dialysis are available. Our analysis shows ARF comprising 10.52 %

cases. This is more or less similar to findings of MZ Kabir et al, which showed ARF in 14 % cases². ..

It is concluded that this study reflect the renal diseases pattern in Bangladesh but larger surveys should be carried out in future to know the exact picture of renal diseases in Bangladesh.

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Announcements

Renal Disaster Relief Task Force (RDRTF): call for volunteers

The RDRTF takes care of interventions during mass disasters such as earthquakes whereby large numbers of acute renal failure (ARF) occur, and support is offered to the local medical and nephrological communities. The RDRTF intervened at the Marmara earthquake in Turkey in 1999, the Bam earthquake in Iran in 2003 and most recently in Kashmir in Pakistan. The RDRTF – European Branch is looking for young doctors, nurses and dialysis technicians who volunteer to take part in our actions. Missions last approximately 10 days. People who are interested, with experience in acute renal failure and/or intensive care nephrology, organising skills, respect for foreign cultures and diplomatic talent are asked to contact Raymond Vanholder, the current chairman of the RDRTF at the following e-mail address: Raymond.vanholder@ugent.be

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Topic: “Update – Peritoneal Dialysis”

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Abstract from NUTS of SAARC 2005

HLA-A and HLA-B antigen pattern in kidney recipient and donor in our community and the role of their matching in renal allograft survival

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Role of matching of HLA antigens in the outcome of kidney transplantation is a well established fact. But properly matched donor selection is a difficult job. In order to observe the pattern of HLA-antigens in our community the pattern of HLA-A and HLA-B antigen was analyzed among one hundred kidney recipients and their corresponding kidney donors in BSMMU. It was observed that some HLA-A and HLA-B antigens are common in our community. Common HLA-A antigen are; A₂ (15%), All (12.5%), A1 (11.5%), A24 (8.5%), A9 (7.5%) and common HLA-B antigens include; B15 (10.25%), B12 (B W44)- (10%), B15+57 (9.75%) and B35+53 (7.5%). In order to find out the role of HLA-antigen matching in renal allograft outcome, 100 kidney transplant recipients and their corresponding donors were observed, who underwent kidney transplantation in BSMMU from 1995 to 2003. All the patients were followed up for 1-year from the date of transplantation. One hundred kidney recipients were divided into two groups, Group I and Group II, depending on the degree of HLA-A and HLA-B antigen matching between recipients and corresponds donor. Group I (n = 74) Contains better matched recipients and group II (n = 26) contains poorly matched recipients.

In group I (n = 74) group II (n = 26) among the recipients, considering the age, sex, duration of dialysis, Ischemic time, immunosuppressive drug there was no significant difference between the groups. Only difference was in the matching of HLA-A and HLA-B antigens. HLA-A and HLA-B locus matching in group I and group II was 1.87 ± 0.42 and 1.00 respectively. In group I, there is significantly more antigen matching in comparison to group II (P < 0.001). Among the donors, considering the age, sex, blood grouping, blood pressure and relation with the recipients, there was no significant difference between group I and group II.

At the end of one year, serum creatinine level in group I and group II was 147.29 ± 33 u mol/lit and 273.07 ± 50 u mol/lit respectively. The level of serum creatinine was significantly higher in group II in comparison to group I (t = 2.06, P < 0.05). Occurrence of acute rejection in group I and group II was 17 (22.97%) and 15 (57.70%) respectively. The occurrence of acute rejection is significantly higher in group II (P < 0.001).

Graft survival was 67 (90.54%) and 17 (65.38%) in group I and group II respectively. There is significantly better graft survival in group I (P = < 0.05). Graft failure in group I and II was 7 (9.46%) and 9 (34.62%) respectively. There is significantly more graft failure in group II in comparison to group I (P < 0.05). Conclusion: In conclusion it is observed that some HLA-A and HLA-B antigens are common in our community. Better the HLA-A and HLA-B antigen matching better is graft survival and fewer is occurrence of acute graft dysfunction.

Candida-Infection after kidney transplantation in a german transplant unit

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With more than 2000 kidney transplantation per year this is one of the important therapy modalities for end stage renal insufficiency in Germany.

In our department we have at about 80 kidney transplants per year, of which one third is done within the project "old for old".

The risk to develop a candida infection after transplantation in our collective is elevated up to 20% mainly due to factors like immunosuppression in combination with the age. For the adequate therapy it's necessary to differentiate between opportunistic and

invasive mycosis, of which the second goes with a high lethality.

The interaction between antifungal therapy and immunosuppression is complicating the therapeutical regime.

We would like to present our data with results and outcomes of candida infection after kidney transplants of the last 5 years.

Transmission of Hepatitis C virus in chronic haemodialysis patients -a single center experience

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Hepatitis C Virus is a major form of hepatitis and an important cause of liver disease in haemodialysis patients. Haemodialysis is considered to be one of the main risk factors of HCV transmission. Therefore, the prevalence of antibodies to HCV was studied in patients undergoing maintenance therapy in the nephrology department of Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. The screening was done by using third generation enzyme linked immunoassay and solid phase radio immunoassay (SPRIA). A total of 53 patients were studied with age ranging from 18 years to 65 years. Thirty four were male and nineteen were female. The prevalence rate with third generation enzyme immunoassay was 77.36% to exclude false positive ELISA, solid phase radio immunoassay (SPRIA) was done. The prevalence rate came down to 69.81%. Out of 53 patients 37 (80.4%) patients were positive and 9 (19.6%) were negative. In SPRIA method 33 (71.7%) were positive and 13 (28.3%) were negative. Both the results were statistically significant. However, interestingly 4 (57.1%) patients who had no blood transfusion were HCV positive and in patients who were on injection EPO were found to have 66.67% ELISA positive and 33.3% SPRIA positive, which may be due to nosocomial transmission of the virus. In conclusion, HCV is a major health problem in dialysis patients in Bangladesh. Identifiable risk factors are blood transfusion and most probably lack of adherence to universal infection precautions.

Experience of Continuous Ambulatory Peritoneal Dialysis in Bangladesh

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Continuous Ambulatory Peritoneal Dialysis (CAPD) is a relatively new mode of renal replacement therapy in Bangladesh yet to be popularized. In order to evaluate the clinical outcomes we report our experience in this field.

Material and Methods : Total 268 cases were managed by CAPD in this country between January 1997 and October 2005. Fourteen patients died before initiating regular exchange and 9 patients lost for follow-up and were excluded. Therefore, 245 patients were studied. Mean age was 58.56 ± 18 years (range 6 – 86 years); 167 were male and 87 female. Cause of ESRD was Diabetic Nephropathy in 156 (63.67%), Glomerulonephritis in 40 (16.33%), hypertension in 37 (15.10%) and others in 12 (4.90%). Indication of CAPD were haemodynamic instability in 143 (58.36%), long distance from haemodialysis center 39 (15.92%), patients choice 33 (13.47%) and vascular access problem in 30 (12.25%). 180 (70.86%) patients required haemodialysis before initiating CAPD. Most of the patients used Baxter PD fluid and most of the time with twin-bags, 2-L cycles were used 3 times daily. Twelve (4.7%) patients performed the dialysis themselves and the rest needed the help of an assistant.

Results : Total duration of follow-up was 4826 patient months, mean 19.98 (16.78 range 1 to 69 months). At the time of reporting mean Hb, creatinine, urea, potassium and serum albumin were 9.7 (1.43 g/dL), 6.1 (2.12 g/dL), 90.12 (24.53 g/dL), 3.11 (1.42 mmol/L) and 31.45 (1.32 g/L) respectively. Peritonitis was the major problem one episode per 19.46 patient-month. Exit site infection one episode per 53 patient months. Only 1 patient died of septicemia resulting from peritonitis and 5 patients required catheter removal and 2 required subsequently re-implantation. There were 2 cases of technique failure due to catheter migration and blockage. Patient survival was 1 year 160 (63%), 2 years 122 (48%), 3 years 79 (31%). Most of the patients died due to cerebro-vascular or cardiac complications.

Conclusion : Although most of our patients were elderly diabetic patients with poor general conditions, yet CAPD can be a good mode of renal replacement therapy in this country.

CRRT IN CRITICALLY ILL PATIENTS - THE OPENING EXPERIENCES

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Continuous Renal Replacement Therapy is new mode of renal replacement therapy in Bangladesh. We started this form of therapy on critically ill patients in our hospital in February 2005. We report our early experiences in this form of treatment.

Materials and Methods: Total 22 cases were managed by CRRT in this country between February 2005 and October 2005. Mean age was 48.57 ± 18 years (range 36–74 years); 15 were male and 7 female. Cause of ARF was septicemic shock in 10 (45.45%) cases, cardiogenic shock in 3 (13.64%) cases, acute pancreatitis in 6 (27.27%) cases and in 3 (13.64%) cases the cause was not established. Thirteen (59.10%) of the cases had acute on the top of Chronic renal Failure and 9 (40.90%) had frank acute renal failure. Seventeen (77.27%) of the patients were diabetic. Indication of CRRT was haemodynamic instability in all the case. B Braun's Diapact CRRT machine was used with 3 pumps. Continuous Venous Venous Haemofiltration (CVVH) was the main mode of therapy.

Results: Mean duration of therapy was 47 ± 25 hours (range 18 to 78 hours). Kt/V was 0.71 ± 0.02 at 24 hours, 1.87 ± 0.052 at 48 hours and 3.38 ± 0.074 at 72 hours. Urea reduction Ratio was $47.75 \pm 3.24\%$, $53.37 \pm 5.87\%$ and $57.33 \pm 6.14\%$ respectively. Mean ultrafiltration was 68 ± 46 ml / hour (range 40 – 140 ml). Systolic BP showed increment in 8 case and it was statistically significant ($p = 0.04$). However there was no increase in urinary output throughout the treatment time. More than one sessions of CRRT was required in 4 patients. Clotting of the extracorporeal circulation remained the main complication. Hypotension was seen in 3 cases. Hypokalaemia was another complication found in 5 cases and required replacement. Three patients came out alive and the rest died from causes unrelated to renal failure.

Conclusion : Although most of our patients were elderly and diabetic yet CRRT can be a good mode of renal replacement therapy in critically ill patients.

Renal Transplant in Bangladesh

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A total of 458 renal transplant patients with a mean age of 34 years (range 12-68 yr.; M-280, F-178) were followed up in Dhaka, Bangladesh over a period of 12 yr. Amongst them 280 (64%) were living related (LR) and 178 (36%) were living unrelated (LUR). All LUR renal transplants except spouse were performed outside, but subsequently followed up in Bangladesh. All patients were treated with Cyclosporine 8mg/kg/day, Azathioprin 1 mg/kg/day and Prednisolone 0.5mg/kg/day. Cyclosporine was withdrawn in 180 patients who had living related transplant after 6 months and continued with Azathioprin and prednisolone where as Cyclosporine continued in living unrelated patients in a maintenance dose of 2-3 mg/kg body wt.

One, live and ten years' survival in LR patients were 93%, 83% and 77% respectively; where as in LUR were 91%, 82% and 70% respectively and the difference was not significant. However acute rejections were noted to be significantly higher in LUR (24%) as compared to LR (13%) patients. Of the long-term complications Diabetes Mellitus was significantly higher in LUR (35%) as compared to LR (6%). However no difference were noted in the incidence of Chronic rejection (23% Vs 12%), Tuberculosis (7% Vs 5%) and viral Hepatitis (3% Vs 2%). 123 patients died during this period in both groups. Of them 76(25%) were from LR and 47 (31%) from LUR.

It is concluded conventional therapy is effective in LR transplant patients and the comparable survival of LUR patients are possibly due to continuation of Cyclosporine therapy.

Perspectives of Cadaveric Kidney Transplantation in Developing Countries

WAI-CHOONGLYE

Kidney transplantation improves survival and quality of life in patients with end-stage renal disease. In comparison to the developed nations where deceased donor kidney transplantation rates ranged from 50 to 60 per million population (pmp), the rates in developing countries in

Asia ranged from non-existent to 5 pmp. Data from the transplant registries in Asian countries are not well documented. Although brain death has been recognized in the majority of Asian countries, many developing countries still do not have an active national deceased donor kidney transplant programme. The reasons for the failure of development of a successful deceased donor kidney transplantation programme include poor infrastructure, low literacy rate, inadequate staffing, insufficient intensive care facilities, socio-cultural and religious reasons. Pre-hospital emergency services must be adequate to allow the survival of the potential donor to reach the hospital for certification of brain death. Adequate intensive care facilities must be present to allow survival of the brain dead donor before certification and organ procurement. Adequate staffing must be present to facilitate certification and procurement of organs at all hours to reduce ischaemic times. Experienced transplant surgeons and nephrologists must be available to ensure a successful programme. Religious and socio-cultural obstacles must be resolved to be able to achieve satisfactory donor rates. Affirmative action may be used to increase deceased donor kidney transplant rates. When there is an established programme, extended deceased donor kidneys may be utilized. Finally, as part of the development of a deceased donor programme, efforts to expand the live donor programme should not be overlooked.

Chronic Renal Failure in Children

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The study was carried out to see the etiology and outcome of chronic renal failure (CRF) in children. It was a prospective study, carried out to evaluate all new cases of CRF in children < 15 years in Paediatric Nephrology unit of BSMMU from May 2000 to May 2002. Diagnosis of CRF was based on Ccr < 75 ml/min/m² along with other features of CRF with no evidence of recovery over ensuing three months.

A total of 44 children with CRF having mean age of 8.73±3.56 years were diagnosed during study period, among them, 30 cases (68.19%) were male and 14 cases (31.81%) were female. Causes of CRF were obstructive uropathy in 24 cases (54.55%) followed by glomerular diseases in 15 cases (34.9%), hereditary disorders in 3

cases (6.81%), and reflux nephropathy in 2 cases (4.54%). At presentation, 13 (29.55%) children had mild to moderate CRF and 31 (70.45%) children had severe CRF and ESRD. Mean follow up period was 32.3 weeks. At the end of study period, 8 patients of mild to moderate CRF were on conservative treatment, 6 patients of severe CRF and ESRD group attended for maintenance dialysis irregularly, of which, 3 died at hospital and rest of the patients did not attend at follow up, due to financial reason or opted against IPD.

In the present study, majority of the children with CRF were due to treatable obstructive uropathy; mostly PUV and most of them presented with advanced renal disease.

Impact of Etiology of Chronic Renal Failure on Pattern of Growth In Children: A Hospital-Based Study

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Place of study: Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh.

Aim: To find out the impact of different etiology of chronic renal failure on growth and other subsequent effects in children.

Methods: This prospective study was carried out in the Department of Paediatrics, BSMMU, Dhaka from October 2001 to October 2003. Fifty children of both sexes under 15 years of age with clinical and biochemical evidence of chronic renal failure (CRF) with creatinine clearance (Ccr) of <75 ml/min/1.73 m² were included in the study. On the basis of underlying causes of CRF, the children were divided into congenital (n=30) and acquired (n=30) groups. Height and weight were measured by standard method. Radiographs of different sites were obtained to evaluate presence of renal osteodystrophy (ROD) and to calculate bone age. Serum intact parathormone (iPTH) level was also assayed in all patients. Growth parameters and presence of radiographic and biochemical features were evaluated in two groups.

Results: Stunting and bone age delay were present in significantly higher number of children in congenital group (P<0.001). Alkaline phosphatase and iPTH were also significantly higher in that group (P<0.05). Radiographic features of ROD was present in 50% in congenital group

in comparison to 20% in acquired group, and growth zone lesion was commonest lesion.

Conclusion: Chronic renal failure should be diagnosed as early as possible to prevent growth potential.

Nephrotic Syndrome in Bangladeshi Children : A Clinicopathological Study

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This age and sex matched prospective case control study was conducted in the department of Paediatric nephrology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, over a period of two years from September 2001 to September 2003.

Aims and objectives : The aims and objectives of the study was (1) to find out the clinicopathological spectrum of nephrotic children having atypical presentation, and (2) to compare this spectrum with those of typical nephrotic children taken as control. **Methodology :** A total 68 children of age 3 months to 15 years of either sexes with initial episode of nephrotic syndrome were enrolled in the study. Those nephrotic children had atypical clinical and biochemical presentations (haematuria, hypertension and impaired renal function) were considered cases (40 in number) and those without atypical presentations, were taken as control (18 in number) in this study. The children with congenital nephrotic syndrome, nephrotic syndrome due to secondary causes and those who were unwilling to do renal biopsy were excluded from the study.

Result: Important observations regarding presenting features in atypical nephrotic syndrome were anasarca in 34 (85%), hypertension in 20(50%), gross haematuria in 18(45%) and severe infection in 12(30%) cases. On the other hand in typical nephrotic syndrome, 10(55.5%) patients had anasarca and 6(33.3%) had severe infection. Biochemical profiles, such as serum albumin, serum cholesterol, blood urea, serum creatinine and 24 hours urinary total protein (UTP) showed significant difference in the atypical nephrotic syndrome patients than the typical group. Renal biopsy study showed different patterns of histopathology in which Mesangial proliferative glomerulonephritis comprises the most

number (55%). Next to this was Membranoproliferative glomerulonephritis and Minimal change disease (10%each). Other varieties present were Membranous glomerulonephritis (7.5%), Focal and segmental glomerulosclerosis (5%) IgA Nephropathy (5%) Proliferative glomerulonephritis (5%) and chronic glomerulonephritis (2.5%). On the other hand in the typical nephrotic syndrome patients, Minimal change was the predominating histopathology (85%) and only 15% patients had Mesangial proliferative glomerulonephritis.

Conclusion: It may be concluded from this study that Mesangial proliferative glomerulonephritis was the predominant histological variant in childhood nephrotic syndrome with atypical presentation. Their biochemical parameters like serum albumin, serum cholesterol, urinary total protein and renal functions significantly differed with those of typical nephrotic syndrome children.

Histological Pattern of Glomerulonephritis

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Glomerulonephritis is an important cause of morbidity and mortality throughout the world. Renal biopsy was done among the patients of age 12 years onwards having suspected glomerulonephritis with variable presentations, admitted in the nephrology department of Rajshahi Medical College Hospital from September 2000 to October 2005. Biopsy of inadequate specimen were excluded from the study.

Total number of patients included in this study were 250. Among them 145(58%) were male and 105(42%) were female. Most of the patients 88(35.2%) were in the age group 21-30 years, followed by 84(33.6%) under the age group 12-20 years. Most of the patients 122(48.8%) had nephrotic range of proteinuria. Normal renal function were found in 167(66.8%) cases and 82(32.8%) patients were hypertensive.

Regarding classification of glomerulonephritis, Primary glomerulonephritis were 226(90.4%) and Secondary glomerulonephritis (Lupus nephritis) were only 24(9.6%). Regarding histopathological examination Mesangial proliferative GN were 127(50.8%), followed by Minimal change disease 70(28%) and Membranous GN 17(6.8%), Membranoproliferative 16(6.4%), Focal and segmental glomerulosclerosis 11(4.4%), Chronic GN 6(2.4%) and Crescentic GN 3(1.2%).

It is concluded that among the glomerulonephritis patients, Mesangial proliferative GN is most common in our population.

Clinical Profile of Obstructive Uropathy in Children

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Objective : The objective of the study was to find out clinical, biochemical, hematological & bacteriological profile in Children with obstructive uropathy.

Methodology : This prospective study was conducted in Pediatric Nephrology Unit, Department of Paediatrics, BSMMU, Dhaka from April, 2004 to October, 2005. A total 31 children of 4 months to 13 years with clinical features of obstructive uropathy were enrolled in the study. Obstructive uropathy was diagnosed by taking detailed history, physical examination & relevant imaging.

Results: Out of 31 cases, 13 (41.93%) were in the 1-5 years age group and male female ratio was 6.75:1. PUV was the commonest (41.93%) type of obstructive uropathy followed by primary VUR (19.35%). Fever was the commonest presentation (67.74%) followed by dribbling of urine (61.29%), straining during micturition (51.61%), Abdominal mass (32.26%), Grade III MN (22.58%), hypertension (12.90%), severe anaemia (6.45%) and severe stunting (3.22%). Mean serum creatinine level were 2.11 mg/dl in PUV & 2mg/dl in PVUR patient. Metabolic acidosis was found in 16.13%, hyperkalaemia in 6.45% & raised blood urea level in 25.81% cases. Significant growth of bacteria in urine culture was found in 9 cases (29.03%) & plenty of pus cells in urine in 6 cases (19.35%). Different types of abnormality were observed in all cases by ultrasonography.

Conclusion: It is concluded from this study that children between 1-5 years of age are the most dominant group for presentation with features of obstructive uropathy and PUV is the commonest cause.

Socioeconomic Status of Different Etiological Groups of CRF Patients

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It is well known that assessment of socioeconomic status is very important in planning the treatment of Chronic Renal Failure (CRF) specially in ESRF. This prospective study was done to determine the

socioeconomic status and their variation in different aetiologic group of CRF.

A total of 190 cases of CRF admitted in Nephrology unit of Chittagong Medical College Hospital were studied during the last two years. Literacy level was assessed in three groups - Illiterate, up to SSC and above SSC. Their standard of living was assessed by their housing, water supply and sanitation Economic status was assessed by the amount of monthly income from various sources like Service, Farming, Business, House rent & other sources of the patient himself or other family members. All data were entered into and analyzed by SPSS for Windows Data Editor.

Among 190 patients, 68% were male and 32% were female. Mean age was 46.2 ± 16.4 years. There were 42.3% patients in CGN group, 35.4% in DN group, 12.2% in Obstructive Uropathy, 6.9% in HTN, 1.1% in APKD & 2.1% in miscellaneous group. Literacy level showed that 32.5% and 29% were illiterate, 48% & 43% were up to SSC, 19.5% & 27.7% above SSC in patients of CGN and DN group respectively. Analysis of housing status reveals 22.5% & 45% of patients live in pukka house, 62.5% & 41.8% live in kuncha house in case of CGN & DN group respectively. Eighty-five percent of CGN group and 83% of DN group drink tubewell water. Twelve percent of both groups drink water from municipality supply. The rest drink water from ponds. Sixty percent of CGN and 71% of DN group use sanitary latrine. The rest use Ring latrine, Open latrine or others. There was no statistical difference in housing, sanitation and drinking water supply among the two groups. In other aetiological groups, these parameters were similar. Study of Economic status revealed that mean monthly income of DN group was highest (TK. 14962 \pm 14329). Mean monthly income of CGN group was Tk. 8492 \pm 7834 and in other groups it was similar to CGN group. Statistically monthly income of DN group was significantly high compared to the CGN and other groups ($P < 0.001$).

ESRF due to Diabetic Nephropathy have higher economic status than that of other aetiological groups though all have similar educational and living standard.

GFR Level in Different Types of Obstructive Uropathy in Children

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This prospective study was carried out in the Paediatric Nephrology Unit, Department of Paediatrics, BSMMU,

Dhaka, over a period of one and half year from April '04 to October'05. The aim and objective of the study was to estimate the GFR level in obstructive uropathy in children. A total 24 hospitalized obstructive uropathy patients were enrolled in this study. Obstructive uropathy was diagnosed by taking history, thorough physical examination and relevant imaging studies. For each case, GFR was estimated by Schwartz formula: $GFR (ml/min/1.73m^2) = K \times height (in\ cm) / serum\ creatinine (in\ mg/dl)$. GFR levels were categorized according to type of obstructive uropathy and staging of Chronic Kidney Disease (CKD).

Posterior Urethral Valve (PUV) was found as commonest type of obstructive uropathy (41.7%) followed by Primary Vesico Ureteric Reflux (VUR), was found in 12.5 % cases. Mean GFR in total obstructive uropathy patients was 47.76 ml/min/1.73M². Mean GFR was 63.24 in PUJ patients, 43.92 in PUV patients and 37.68 in combined PUJ with VUR patients.

While the individual type of obstructive uropathy was categorized according to CKD classification, one patient from PUV (0.07%) and VUR (0.14%) group had stage v or Kidney failure respectively. Both stage 2 and stage 3 CKD were found among 33.33% cases of all obstructive uropathy respectively.

It may be concluded from this study that PUV is the commonest type of obstructive uropathy in children and mean GFR is lowest in combined PUJ with VUR patients than other types obstructive uropathy.

Clinicopathologic and Clinicolaboratory Correlations in Nephrotic Syndrome

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Background & objectives: Nephrotic syndrome (NS) is a common renal disease all over the world. The aim of our study was to document laboratory & histopathological features in idiopathic NS.

Material and Methods: We carried out a study of 44 patients managed in our center who had clinical and biochemical features of NS. The period of this prospective study documentation was from July 2003 through July 2005. We only included Idiopathic nephrotic syndrome.

Renal biopsy was done in all 44 patients. For each patient a specified case record form was used that included sex, age, blood pressure, oligo-anuria, Hb%, blood urea, serum creatinine, serum cholesterol, serum albumin, HBsAg, 24hr urinary total protein and USG of Urinary tract. All 44 patients had biopsy proven glomerulonephritis. Minimal change nephrotic syndrome (MCNS) was by far the most frequent, 16 cases (36.36%). Male and Female ratio was 1:1 and 18 (40.91%) patients were oligo-anuric at presentation. HTN was present in 14 (31.82%) of all patients and 04 (25%) of 16 MCNS patients. Thirty-nine (88.63%) patients were hyperlipidaemic and 43 (97.72%) patients were hypoalbuminaemic. Serum creatinine was increased to >1.1 mg% in 28 (63.63%) of all patients and 6 (37.5%) of 16 MCNS patients.

Conclusion: NS affects all age groups without male and female discrimination. MCNS is most frequent in our adult population. In contrast to findings of others, in this series membranous nephropathy was not found to be more frequent.

Presentation of Posterior Urethral valves - Experience in Bangladesh

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To evaluate the age and mode of presentation of patients with posterior Urethral valves (PUV) in the antenatal and postnatal periods, we analyzed the records of 92 patients with the diagnosis of PUV in a tertiary hospital in Dhaka, Bangladesh from 1998 to 2005. Of the study patients, 21 (22%) were antenatally discovered, 37 (40%) in the first year of life and 34 (37%) after the first year of life. The mode of presentation was antenatal ultrasound in 21 (22%) patients, Urinary tract infection in 28 (30%) patients, poor urinary stream in 31 (33%) patients and retention of urine in neonatal life in five (5.4%) patients and symptoms of renal impairment in 7 (7.6%) patients.

We conclude that the antenatal detection rate of PUV in our study patients is less than international one (70%), despite the fact that most of the antenatal follow-up were done in centers where ultrasound was available for antenatal workup. This calls for more vigilance by the radiologist & obstetrician to enhance the rate of detection of PUV.

Pulse Methylprednisolone & Cyclophosphamide Therapy in the Treatment of RPGN

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Pulse methylprednisolone (MP) & Cyclophosphamide (CTX) therapy are clinically used for the treatment of crescentic glomerulonephritis. In this study, we evaluated the effects of these drugs in the treatment of 22 cases of clinically diagnosed rapidly progressive glomerulonephritis (RPGN) who were admitted in the Nephrology ward, CMCH over the period of September '2004 to September '2005. The diagnosis of RPGN was made on the basis of 5 clinical criteria: i) short history of uremia, ii) patient is not anemic, iii) presence of active urinary sediments, iv) sonologically normal sized kidneys, and v) absence of other systemic diseases. All cases suffered from acute renal failure, and serum urea and serum creatinine (Scr) levels were 181.5 ± 67.3 mg/dl and 8.55 ± 3.7 mg/dl, respectively on admission. The treatment regimes were MP pulse therapy (10 mg/kg body wt./day) for 3 consecutive days and followed by oral prednisolone (0.5 mg/kg/d) and CTX (1mg/kg/d) therapy for 3 months. Out of 22 patients, renal function recovered to near normal (Scr 2mg/dl; range 0.8-2.4 mg dl) In 7 patients (31.8%) and renal function is partially improved (Scr 4.5mg/dl) in 6 patients (27.3%) after the course of treatment. Two patients died during the first hospitalization period, 4 patients (18.2%) advanced to end stage renal disease

(ESRD) and 3 patient's (13.3%) fate was not known as remained unreported in the follow-up clinic. Relatively good out come were observed in patients with mild renal failure and young in age.

Conclusion: Pulse methylprednisolone in combination with Cyclophosphamide therapy appears to be beneficial in the treatment of RPGN patients.

Infrequent Causes of Acute Renal Failure in Chittagong Medical College Hospital

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Commonest cause of acute renal failure (ARF) in the hospital is malaria. This retrospective study is done to show the less frequent causes of ARF and their outcomes. There are 15 cases (12 males and 3 females) with age range 4 - 65 yrs were admitted during last 1 year. Particulars of the patients, etiology, treatment modality and outcome are shown briefly in the following table:

Among 15 cases; 3 had snake bite, 3 had hornet bite, 3 had dengue, and rest 6 cases had other etiologies as shown in the above table. Seven (46%) were treated conservatively, 8 (53%) were treated by intermittent peritoneal dialysis (IPD) and one needed HD in addition. Outcome revealed that mortality was 33.33% in snake bite, 66% in dengue and nil in other cases. However, no definite remark can be done from this small study.

S/No	Age	Sex	Cause of ARF	Treatment	Outcome
1	55 yrs	Male	Snake bite	IPD- twice, & HD- 7 sessions	Fully recovered
2	28 yrs	Male	Snake bite	IPD- once	Fully recovered
3	30 yrs	Male	Snake bite	IPD- once	Expired
4	07 yrs	Male	Hornet bite	IPD- twice	Improved
5	61 yrs	Male	Hornet bite	IPD- once	Improved
6	06 yrs	Female	Honey bee bite	IPD- once	Improved
7	26 yrs	Male	Fish bile ingestion.	IPD- once	Fully recovered.
8	04 yrs	Male	Herbal medicine	Conservative	Fully recovered.
9	65 yrs	Male	Drug ingestion.	IPD- once	Improved.
10	19 yrs	Male	Blunt injury	Conservative	Improved.
11	30 yrs	Male	Viral hepatitis & acute pancreatitis.	Conservative	Fully recovered
12	45 yrs	Female	Acute pancreatitis	Conservative	Fully recovered
13	30 yrs	Female	Dengue	Conservative	Expired
14	50 yrs	Male	Dengue	Conservative	Expired
15	16 yrs	Male	Dengue	Conservative	Fully recovered