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(A Journal of continuing education in kidney diseases)

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BANGLADESH RENAL JOURNAL

(A Journal of continuing education in kidney diseases)

INSTRUCTION FOR AUTHORS

Renal Association Journal appears twice in a year and it publishes original articles, review articles, clinical communications, recent advances in renal diseases and letters to the editors. The editors reserve the right to select from submitted manuscripts and the right of stylistic changes or abridgements. The manuscripts may not be offered elsewhere for printing and publication; following acceptance, the publisher acquires all copywright.

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Grindley MF: Manual of histologic and special staining Nephrologic, Elammarion, Paris, 1965.

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 fitration rate	GFR
gram (s)	g
Grams per cent	g/100mi
half-time	tf1/2
hour (s)	hr
inch	inch
International Unit (s)	IU
Intramuscular	im.
intraperioneal	i.p.
intravenous	i.v.
inulin clearance	Cln
Kilogram (s)	Kg
liter (s)	L
meter (s) or milli	m
microns (s) or micro	µ
milligram (s) per cent	mg/100ml
minute (s)	min
molar	M
mole (s)	mole (s)
Molecular weight	molwt
nanogram (s) (millimicrogram)	ng
nanoliter (s) (millimicroliter)	nl
normal (concentration)	N
not significant	NS
optical density	OD
osmole (s)	Osm
probability	P
second (s)	sec
standard deviation	SD
standard error	SE
standard error of the mean	SEM
ultraviolet	UV
unit (s)	U
volt	V

MANUSCRIPTS SHOULD BE SUBMITTED

To

Prof. Harun-Ur-Rashid Ph. D, FCPS, FRCP
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Anti Reflux Surgery: Efficacy and Outcome

Md. Nasir Uddin, AKM Zamanul Islam Bhuiyan, Kazi Rafiqul Abedin, Kazi Zikrur Razzaque

Summary :

Vesicoureteric reflux is the commonest urological anomaly in children that are associated with repeated pyelonephritis, progressive renal scarring, chronic renal failure and frequently require renal replacement therapy. It not only increases the morbidity of the patients, but also increases the financial burden and may cause even death. Management of it is a challenging issue, especially for high grade (IV and V) vesicoureteric reflux where antireflux surgery is required for renal and patient's growth and for good quality of life. To find out the efficacy and outcome of antireflux surgery for VUR. In this retrospective study total 48 patients were included who underwent antireflux surgery for VUR. This study was carried out at National Institute of Kidney Diseases and Urology and also in some other private hospitals from January 2005-December 2008. Indications of antireflux surgery were breakthrough infection, medical noncompliance and grade IV and V vesicoureteric reflux. In bilateral cases operation was done separately on both sides. Operation was done by Lich Gregoir extravesical technique. 7 patients (14.58%) required tailoring of ureter.Patients were followed up at 3,6,12 and 24th months after surgery. 48 patients were included in this study, among them male were 17 and female were 31.Patients were between 5 months to 15 years with mean age 5 years. In 19 cases it was unilateral and in 29 cases it was bilateral involvement . During post surgery follow-up 43 patients (89.58%) showed no reflux, 3 patients (6.25%) showed VUR recurrence and 2 patients (4.16%) showed vesicoureteric stenosis. VUR recurrence and vesicoureteric stenosis were managed by re-operation. 3 patients (6.25%) developed wound infection and was improved by conservative management. Antireflux surgery is an effective treatment for high grade vesicoureteric reflux to prevent the progressive renal scarring, development of chronic renal failure and to improve the quality of life.

Key words: Vesicoureteric reflux (VUR), Antireflux surgery, Lich Gregoir technique.

(Bang. Renal J. 2009; 28(1): 6-9)

Introduction:

The urinary tract is often the site of bacterial infection during childhood. Underlying structural abnormalities of the urinary tract are found in 30-50% of girls and in somewhat higher proportion of boys with bacteriologically confirmed infection[1]. Vesicoureteric reflux is the most common urological anomaly in children occurring in 25-30% of patients with acute pyelonephritis[1]. Of children's with symptomatic VUR, 30-50% has radiological evidence of renal scarring, resulting from congenital dysplasia, acquired damage after infection or both. VUR is one of the important causes of hypertension in children. Different series showed that 10-20% of children develop hypertension or CKD who suffered from VUR[2]. Older studies showed 15-20% of CKD in children and in young adult are due to chronic pyelonephritis and reflux nephropathy[1].

In epidemiological surveys of school girls aged 5-11 years, one third of those with covert bacteriuria were found to have VUR, one fifth reflux nephropathy[3,4]. Similarly, in a retrospective analysis of out patients with urinary tract infection it was found that 52% of 104 children had VUR and that 23% of their kidneys were scarred[5]. From a total of more than 50000 school girls screened Hodsons estimated the prevalence of reflux nephropathy to be one in 250 individuals[6].

There is an increased risk of hypertension due to both unilateral and bilateral reflux nephropathy[7], and of progression to chronic renal failure in the case of extensive bilateral diseases. While there are as yet no reliable figures for the incidence of chronic failure based on prospective studies, preliminary figures suggest that this is around 5%-6% [8].Nevertheless, Chronic pyelonephritis accounted for 27% of children[9] and 21% of adults entering renal

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replacement program in Europe, and reflux nephropathy was found to be the commonest single cause of chronic renal failure in a large childhood series[10]. Reflux nephropathy is a acquired lesion, dependent upon the coexistence of infection and intrarenal reflux. Intrarenal reflux is unalterable in VUR although urinary tract infection is treatable. Thus any effective method of preventing the development of and extension of renal scaring might be expected to have an appreciable impact on the escalating costs of dialysis and transplantation. The main aim of treatment of VUR is firstly the control of symptoms that were due to infection and detrusor instability and secondly the prevention or limitation of renal parenchymal damage by antireflux surgery.

Although there is no doubt that carefully monitored chemoprophylaxis can reduce the incidence of bacteriuria[11], but a study conducted by White showed breakthrough urinary tract infection in a quarter of the children who were nominally receiving chemoprophylaxis. Yet in 2nd and 3rd grade of VUR, low dose chemoprophylaxis provides good results in children with encouragement of a liberal fluid intake to create a good bladder washout effect. But there is no single therapeutic option for all clinical settings of VUR. Treatment options depends on clinical course, grading of VUR, infection, presence of renal scar, renal function, bladder capacity, associated renal anomalies, age, compliance and parental preference [2,12,13]. Operative treatment that was indicated for grade IV and grade V vesicoureteric reflux, has a high technical success rate in experienced hands[8] and this would seems to be a logical way of preventing infected urine from reaching to the renal parenchyma.

Methods & Material:

In this retrospective study total 48 patients were included. The study was carried out at National Institute of Kidney Diseases and Urology and also in some other private hospitals of Dhaka city from January 2005-December 2008 among patients who underwent antireflux surgery for VUR. Indications of antireflux surgery were breakthrough infection, medical noncompliance and grade IV and V vesicoureteric reflux.

Patients who presented with urinary tract infection, nocturnal enuresis, failure to thrive, hydronephrosis, hypertension and in some cases even renal failure. Patients were evaluated with urine RME and culture to exclude infection and organisms, S. Creatinine to see renal functional status ,USG of KUB to see hydronephrosis, hydroureter, bladder capacity and post void residue, X-Ray KUB to exclude stone. MCU to diagnose and grading VUR, DMSA scan for static renal function and Urethrocystoscopy to see the position and configuration of ureteric orifice and identifying additional anatomical abnormalities.

In this study Surgical correction was done by Lich Gregoir repair. In bilateral cases operation was done separately on both sides. 7 patients (14.58%) required tailoring of ureter.

Patients underwent operation in supine position with urethral catheter in situ. Gibson incision was made with division of external oblique aponeurosis and separation of internal oblique and transverses abdominis muscle. Peritoneum separated medially. Identification and mobilization of ureter was done towards its entry into the bladder preserving its vasculature as much as possible. Placing two stay sutures on the lateral wall of the bladder and divided the detrusor muscle completely up to the bladder epithelium. Spatulation of the ureter with suture with the bladder epithelium keeping D-J stent in situ with 4/0 Vicryl loosely. In 7 cases tailoring of the dilated ureter were required. Wound closed in layers after keeping a drain in situ with proper homeostasis.

Postoperatively patients were managed with antibiotics, analgesics and other supportive measures. Urethral catheter removed on 14th post operative day. Followup at 3, 6, 12, and at 24 months after operation included in addition to history and physical examination, Urine RME, culture and USG of KUB. MCU were done incase of repeated infection to detect recurrence of VUR. IVU were done in suspected case of vesicoureteric junction obstruction.

Results:

Total 48 patients underwent antireflux surgery by extravesical Lich-Gregoir technique. Age range were 5 months-15 years mean 5 years. Among them less than 1 year 7, 2-5 years 28 and 6-15 years were 13 patients (Table-I). Male were 17 and female were 31(Table-II). In 29 patients it was bilateral and in 19 cases it was unilateral. In bilateral involvement operation was done separately in each side.7 patients required tailoring of the ureter.

Follow-up after 24 month post surgery showed out of 48 patients 43 (89.58%) showed no VUR with good outcome with only 3 patients (6.25%) showed recurrence of VUR that were managed by reoperation. Two patients (4.16%) showed uretero-vesical stenosis that were also managed by reoperation. Three patients (6.25%) developed wound

infection and subsequently that were managed.

Table-I

Age of the patients (N-48)

Age of patients at entry	No. of patients
>1 year	07
2-5 years	28
6-15 years	13

Table-II

Sex distribution (N-48)

Sex	No. of patients
Male	17
Female	31

Table-III

Results (N-48) at the end of 24th months of followup.

Results	No. of patients
No reflux	43 (89.58%)
VUR recurrence	03 (6.25%)
Vesicoureteric stenosis	02 (4.16%)

Discussion:

The urinary tract is often the site of bacterial infection during childhood. Population screening studies showed a slight more prevalence of boys during the neonatal period followed by transition during infancy to a greater prevalence of girls, which progressively increases during the preschool years. Underlying structural abnormalities of the urinary tract are found in 30-50% of girls and in somewhat higher proportion of boys with bacteriologically confirmed infection[1]. VUR is by far the commonest abnormality. There is an increased risk of hypertension due to both unilateral and bilateral reflux nephropathy [7], and of progression to chronic renal failure in the case of extensive bilateral diseases

Operative treatment that was indicated for grade IV and grade V vesicoureteric reflux, has a high technical success rate in experienced hands[8] and this would seems to be a logical way of preventing infected urine from reaching to the renal parenchyma.

In 1975 the Birmingham Reflux Study Group set up a prospective trial of operative compared with non-operative treatment of severe VUR and showed the technical success rate of reimplantation was 98% whereas 51% of VUR treated non-operatively showed presence of Reflux after years of chemoprophylaxis[10]. When reflux was bilateral there was an increased tendency for it to persist[1].

In our series 43 patients (89.58%) showed no reflux, 3 patients (6.25%) showed recurrence of VUR and another 2 patients (4.16%) showed vesicoureteric obstruction during follow up 24 months after operation (Table-III). Two patients lost at 12th months of followup. Two patients developed chronic renal failure and referred to pediatric nephrology department for replacement therapy. After operation 4 patients develop recurrent pyelonephritis, among them 2 patients had recurrent VUR and 2 patients had vesicoureteric obstruction. These 4 patients were managed by revision surgery. In our series 43 patients (89.58%) showed successful repair. Birmingham Reflux Study Group showed 98% success in their series. Although, result of our series was a little less than Birmingham Reflux Study Group. Increasing experience and good technique can abolish this discrepancy. During followup outcome variables considerd appearance, progression of renal scars, of renal growth, recurrence of infection or pyelonephritis, development of hypertension and resolution rate of vesicoureteric reflux. Results of our series were encouraging to decrease the morbidity and increase the quality of life.

Conclusion:

VUR is a devastating disease, early diagnosis, appropriate and quick decision making of surgery for high grade VUR, with good surgical technique can abolish the VUR that can lead to an enjoyable good quality of life.

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Article of Special Interest

The Message for World Kidney Day 2009: Hypertension and Kidney Disease: a Marriage that should be Prevented

George L. Bakris[1] and Eberhard Ritz[2] on behalf of the World Kidney Day Steering Committee*

(Bang. Renal J. 2009; 28(1): 10-13)

Introduction

The kidney is both a cause and victim of hypertension. High blood pressure is a key pathogenetic factor that contributes to deterioration of kidney function. Presence of kidney disease is a common and underappreciated pre-existing medical cause of resistant hypertension[1]. Therefore, treatment of hypertension has become the most important intervention in the management of all forms of chronic kidney disease (CKD). For this reason, the forthcoming World Kidney Day (WKD) on March 12th 2009 will emphasize the role of hypertension for renal disease.

How does one recognize the presence of chronic kidney disease?

In contrast to a decade ago, today most laboratories around the world report estimated glomerular filtration rate (eGFR) instead of or in addition to serum creatinine. This now provides the physician with information about kidney function that is, in general, more informative. As a result, a greater percentage of patients with diabetes or hypertension and their physicians have a better knowledge of their kidney function. Assessment of eGFR as an index of kidney function should be complemented by assessing urine for protein or albumin (preferred).

In spite of these laboratory updates, recent data demonstrate that a given patient's knowledge that he or she has CKD is very low. In a recent analysis of almost half a million people in Taiwan who took part in a standard medical screening program, 12 percent had CKD[2]. It was noteworthy that less than four percent of those with CKD were aware of their condition. People with CKD are several times more likely to die from cardiovascular (CV) causes than those without CKD, thus, hypertension is a major risk factor in this context[3]. The combination of CKD and hypertension, therefore, is a major public health issue; because of the costly treatments necessary for end-stage renal disease (ESRD), end-stage CKD has also become a substantial burden to health budgets.

What is the worldwide frequency of chronic kidney disease?

The frequency of CKD continues to increase worldwide as does the prevalence of end-stage renal disease (ESRD)[4,5]. The most common, but not only, causes of CKD are hypertension and diabetes. The presence of CKD is associated with a large increase in cardiovascular (CV) risk. Moreover, CV risk increases proportionally as eGFR falls below 60 ml/min. Lastly, death from CV causes is higher in CKD and much higher than is cancer in CKD; as a result the identification and reduction of CKD has become a public health priority[6].

The reported prevalence of CKD stages 1-4 in the most recent NHANES (national health and nutrition examination survey) between 1999 and 2006 was 26 million out of a population base of approximately 200 million. This represented United States residents aged 20 and older adult; of these, 65.3% had CKD stage 3 or 4. Those with diabetes and hypertension had far greater prevalence of CKD (37% and 26%, respectively) compared to those without these conditions (11% and 8%, respectively)[7]. In a more recent, yet unpublished report from the CKD surveillance group, the prevalence or amount of CKD stages 1-4 in the general population increased 30%, from 1994 to 2006.

The most recent report of the United States Renal Data System estimates that nearly one-half million patients in the United States were treated for ESRD in the year 2004[8], and by 2010 this figure is expected to increase by approximately 40%. Patients destined to progress to ESRD, i.e. the elderly, are a growing segment of the population. Additionally, males and African-Americans with pre-existing hypertension and CKD are also at much higher risk for ESRD[9]. This observation has also been confirmed

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throughout the developed world: Europe, Asia, Australia and regions of India and Africa[4,5].

The role of hypertension

Hypertension is a global problem, and the situation is projected to get worse. It is the major risk factor for development and progression in nondiabetic and diabetic CKD.

The world population is getting older and aging is the most common risk factor for the development of hypertension and diabetes as well as CKD. Nearly one billion people worldwide have high blood pressure (defined as > 140/90 mmHg), and that number is expected to increase to 1.56 billion people by 2025[10]. The prevalence of hypertension is predicted to increase by 24 percent in developed countries and by 80 percent in developing regions such as Africa and Latin America. One report noted that 333 million adults in economically developed regions such as North America and Europe had high blood pressure in 2000, and an additional 639 million people in developing countries have this condition.

In 1999-2006, the prevalence of hypertension in U.S. adults was 43.4% when defined as >140/90mmHg and similar figures have been reported from many Western countries[9]. The rates of hypertension were highest in participants who were 60 years or older, i.e. 68-80% versus 25% in those between 20- to 39-years, in non-Hispanic blacks (53%) versus Caucasians (43% versus Mexican-Americans (34%). Furthermore, hypertension was more common in individuals with a higher body mass index (BMI) (60% for BMI e" 35 vs. 32% for BMI of 23). Slightly more than half of adults with hypertension were aware of their disease in 1999-2004; fewer than half were treated for their hypertension with medications; and less than two-thirds were controlled to <140/90 mmHg with medication[9]. This trend in poor blood pressure control is observed worldwide.

The hypertension control rate is substantially less in patients with CKD particularly those with diabetes and CKD[1,9]. This is illustrated by the National Kidney Foundation's (USA) Kidney Early Evaluation Program (KEEP), a US-based health-screening program for individuals at high risk for kidney disease[9]. The prevalence (86.2%), awareness (80.2 %,), and treatment (70.0%) of hypertension in the screened cohort were high, however, blood pressure control rates were low (13.2%). The proportion of hypertensive patients increased with advancing stages of CKD.

Which blood pressure component is most relevant for renal and cardiovascular risk, systolic or diastolic?

There is now consensus, based on the totality of the data, that systolic rather than diastolic blood pressure poses the greater risk for cardiovascular events and kidney disease progression. Against this background, it is relevant that in the KEEP study elevated systolic blood pressure accounted for the majority of patients with inadequate control. Male gender, non-Hispanic black race, and BMI of 30 kg/m^2 or more were inversely related to blood pressure control.

What is the blood pressure target for CKD patients? According to the different guidelines published by the major kidney societies, systolic blood pressure should be lowered to values< 130 mmHg. One has to be aware, however, that as a predictor of adverse CKD or cardiovascular events, office blood pressure may be inferior compared to ambulatory blood pressure measurement[11]. This issue is particularly relevant in CKD because of the tendency for nighttime blood pressure to be elevated (little or no nocturnal-dip in blood pressure) and the fact that central (aortic) blood pressure tends to be higher than peripheral (brachial) blood pressure[11,12]. In patients with diabetes, guidelines all recommend that lower blood pressure targets may provide further benefit, but prospective trials have thus far, failed to confirm this epidemiological observation.

The role of diabetic nephropathy

As indicated above, diabetes and hypertension are the most common causes of CKD. There are currently over 240 million people with diabetes worldwide. This figure is projected to rise to 380 million by 2025, largely due to population growth, aging, urbanization, unhealthy eating habits, increased body fat and a sedentary lifestyle. By 2025, the number of people with diabetes is expected to more than double in South-East Asia, the Eastern Mediterranean and Middle East, and Africa. It is projected to rise by nearly 20% in Europe, 50% in North America, 85% in South and Central America and 75% in the Western Pacific region. The top five countries with the highest prevalence of diabetes in order include India, China, the United States, Russia and Japan. Worldwide more than 50% of people with diabetes are unaware of their condition and are not treated.

The same behaviors that increase obesity are shared with those predisposed to diabetes, i.e. family history, presence of hypertension, ageing, excess body weight, lack of

exercise and unhealthy dietary habits. It is important to identify these risks early to reduce the development of diabetes and CKD, since CKD greatly amplifies the risk of cardiovascular events in the diabetic patient.

The remaining challenge

Under diagnosis and under treatment of CKD is a worldwide problem: not only is CKD awareness low worldwide, but the relative lack of CKD risk factor awareness by physicians i.e. hypertension and diabetes is even more disturbing. Moreover, even awareness of these risk factors does not ensure adequate treatment; this could relate either to the behavior of the patient, the provider or both. Thus, the problem of CKD remains a challenge as exemplified by recent data showing that between 1999-2006, <5% of people with an eGFR <60 ml/min/1.73 m^2 and proteinuria were aware of having CKD; of those with CKD stage 3, awareness was only 7.5%; for stage 4, awareness was less than 50%. Awareness rates among those with CKD stages 3 or 4 were higher if co-morbid diagnoses of diabetes and hypertension were present, but even then, they were quite low (20% and 12%, respectively).

One barrier to overcome in order to ensure greater awareness is a more focused education of physicians, since they are the purveyors of the patients' medical condition. In one survey, more than one-third of primary care physicians in the US were not aware that family history was a risk factor for CKD, while almost one-quarter did not perceive African-American ethnicity as a CKD risk factor; in contrast, nearly all perceived diabetes (95%) and hypertension (97%) as risk factors for CKD. Even more problematic was the fact that while diabetes and hypertension were acknowledged as CKD risk factors the achieved control rates (defined as reaching guideline goals) sadly remains well below 50% among those treated.

What can be done about this problem?

There have been many consensus panels over the past decade to approach ways to achieve better blood pressure control and educate physicians to the stages of CKD[13,14]. The road to improve outcomes is to focus on public awareness and screening programs as well as programs to educate both patients and physicians. Data from the KEEP screening program in the US has also noted that blood pressure values are most likely to be at goal once a patient is aware they have kidney disease[15]. Data from Bolivia highlights the observation that once kidney disease is diagnosed more appropriate interventions to reduce CKD risk factors such as hypertension are instituted[13].

Programs to address these issues have started around the world including KEEP type programs. As a major focus of **World Kidney Day** this year the issue is hypertension in CKD (http://www.worldkidneyday.org)

Because of the aging world population and consequent increasing prevalence of hypertension and diabetes, CKD rates will continue to increase. This has and will continue to place an undue economic burden on societies given the costs for an ESRD program. In 2005, the US spent $32 billion dollars on such programs. These facts mandate that measures be put forth to ensure timely detection and prevention of CKD progression. The key to ensure successful prevention of CKD is screening for hypertension, improved testing and diagnosis of predisposing co-morbidities such as diabetes and aggressive treatment to guideline goals.

The International Society of Nephrology (ISN) and the International Federation of Kidney Foundations (IFKF) have an ambitious long-term goal that worldwide, that every individual, particularly the patient with diabetes, knows his or her blood pressure values. Additionally, they should be aware that prompt treatment is necessary once blood pressure values are no longer in the normal range. Finally our societies strongly encourage public health authorities to support efforts to raise public awareness of CKD and promote moves to reduce the risk of developing hypertension. Such governmental public health initiatives are exemplified by countries like the United Kingdom, Finland and Japan reducing salt in the diet and mandating labels have sodium content as in the US. These initiatives have proven highly successful based on reduction in cardiovascular mortality and morbidity.

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Role of Vitamin D in Diabetic Nephropathy

Md Shahidul Islam

Summary :

The renin-angiotensin system (RAS) is a major mediator of progressive renal injury in Diabetic Nephropathy (DN), and RAS inhibitors have been used as the mainstay of treatment for Diabetic Nephropathy. One major problem limiting the efficacy of the RAS inhibitors is the compensatory renin increase caused by disruption of renin feedback inhibition. Vitamin D negatively regulates the RAS by suppressing renin expression and thus plays a reno protective role in DN. Combination therapy with RAS inhibitor and a vitamin D analogue markedly ameliorates renal injuries due to blockade of the compensatory renin increase by the analogue. The most recent data demonstrate that vitamin D and its analogues have renoportective and therapeutic potentials in DN through targeting the RAS.

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Introduction :

In recent years, vitamin D deficiency has been recognized as an important cause for the initiation of chronic kidney disease (CKD), and vit D has been shown to have a reno protective activity. Active vitamin D and its analogue, 22-oxacal ameliorate puromycin aminonucleoside induced nephrosis in experimental animals[1]. Diabetic nephropathy is a long-term complication of diabetes mellitus, and effective blockade of the progression of nephropathy remains a medical challenge. As activation of the RAS in the kidney is a major mediator of renal injuries in diabetic nephropathy,[2] small-major mediator molecule inhibitors targeting the Renin Angiotensin system (RAS) namely Angiotensin converting enzyme inhibitor (ACEIs) and Angiotensin Receptor Blocker (ARBs) are currently used for treatment of diabetic nephropathy[3]. This therapy is based on the theory that blockade of the RAS reduces the intraglomerular pressure and thus proteinuria; however, inhibition of the RAS also ameliorates blood pressure-independent renal injury cause by Ang II[4]. The efficacy of the RAS-targeting drugs is often compromised by the reactive renin increase caused by disruption of the renin feedback inhibition[5]. This clinical problem is not solved even with the use of the new renin inhibitor aliskiren which blocks the enzymatic activity but not the production of renin. Patients treated with aliskiren had plasma immunoreactive renin increased to a level higher than that when valsartan (ARB) was used[6]. High renin buildup increases the risk of Ang II-dependent and independent organ damages. 1,25 $(OH)^2$ D^3 re-presses renin gene transcription provides a good basis to use vitamin D analogs for the suppression of the compensatory renin increase because the analogs directly inhibit renin biosynthesis[7]. Based on this principle, it was found that combination therapy with an ARB and a vitamin D analog very effectively blocks the development of diabetic nephropathy in both type 1 & type 2 diabetes mellitus, as a result of effective inhibition of renin and Ang II production within the kidney**[7].** This finding has important implications for new therapeutic intervention of diabetic nephropathy with vitamin D analogue.

Proteinuria and glomerulosclerosis are the pathological hall marks of diabetic nephropathy[8]. The most profound effect of the combination therapy is the complete prevention of albuminuria in the diabetic mice without a significant change of the blood glucose[8]**.** Microalbuminuria is a major risk factor for progressive renal function decline in diabetic nephropathy and is thought to be the first step in inevitable progression to proteinuria and renal failure [9]. Thus, reduction of albuminuria is a major target for Reno protective therapy in both type I and type 2 diabetes, clinical studies have demonstrated that ACEIs and ARBs can reduce albuminuria in diabetic patients; however, not all patients respond to the treatment in many cases because of incomplete blockade of the RAS. An early study showed that 1,25 $(OH)_2$ D_3 treatment significantly decreased albuminuria and podocyte hypertrophy in subtotally

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nephrectomized rats[10]. Paricalcitol therapy was also reported to reduce proteinuria in CKD patients, study demonstrated that losartan or paricalcitol alone moderately reduced albuminuria in diabetic mice; interestingly, losartan and paricalcitol appeared to act synergistically, and their combination therapy completely normalized the structure of the glomerular filtration barrier, preventing GBM thickening and podocyte effacement[10].

Vitamin D/vitamin D analogue therapy offers significant survival advantage for patients with chronic kidney disease, with improvement in renal and cardiovascular functions[11]. A recent clinical trial shows that paricalcitol, an activated vitamin D analogue, can reduce proteinuria in chronic kidney disease patients[10].In subtotally nephrectomized rats, oxacalcitriol a low-calcemic vitamin D analog, inhibited mesangial proliferation in vitro and ameliorated glomerular injury in rats with glomerulonephritis[11].

The most recent data demonstrated, great therapeutic potentials of low-calcemic vitamin D analogues in the intervention for the progression of DN[11].

At present, two vitamin D analogues, paricalcitol and doxecalciferol, are approved by the US Food and Drug Administration for treating kidney disease in the United States. These two compounds can suppress renin expression[11].The renin-angiotensin system (RAS) is a major mediator of progressive renal injury in DN and RAS inhibitors have been used as the mainstay treatment for DN. One major problem limiting the efficacy of the RAS inhibitors is the compensatory renin increase caused by disruption of renin feedback inhibition. Vitamin D negatively regulates the RAS by suppressing renin expression at receptors level and thus plays a Reno protective role in DN.

Conclusion:

Combination therapy with an RAS inhibitor and a vitamin D analogue markedly ameliorates renal injuries due to blockade of the compensatory renin increase by the analogue. Recently vitamin D and its analogues have been identified as having reno protective and therapeutic potentials in DN through regulating other genes involved in renal injury.

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Original Articles

Papanicolaou Stain of Urinary Red Cells Morphology in The Diagnosis of Glomerular Disease

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Summary

Glomerular diseases constitute one of the leading causes of end stage renal disease in our country. Urinary red cells morphology is a useful diagnostic marker for glomerular haematuria. The study of urinary red cells morphology by phase-contrast microscope (PCM) is not so popular in our country. The value of urinary dysmorphic red cells and G1 cells (special type of dysmorphic red cells) count by Papanicolaou stain (PS) was evaluated in our study in the diagnosis of glomerular diseases. Urine samples of 120 patients with haematuria and proteinuria were examined. The percentage of dysmorphic red cells and G1 cells were calculated. Cases were divided into group I (>20% dysmorphic red cells- glomerular group) and group II (≤ 20% dysmorphic red cells - non glomerular group). Renal histopathology was used as the gold standard method for the diagnosis of glomerulonephritis. Result from PS showed a sensitivity of 85.4%, specificity of 100% in the diagnosis of glomerular diseases by dysmorphic red cells count while by the G1 cells count, a sensitivity of 90.2% and specificity of 100% were observed by using PS stain. PS is a simple, affordable, non invasive test that can be used in the diagnosis of glomerular diseases. This also can be used as a substitute method where the facilities of PCM are not available. This technique will help the clinicians to avoid unnecessary, often invasive diagnostic procedure.

*Key word**: Papanicolaou stain, Glomerular disease, Haematuria, Dysmorphic red cell, G1 cell.***

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Introduction

Despite considerable advances in health care, glomerular diseases constitute one of the leading causes of end stage renal disease (ESRD) throughout the world. In Bangladesh, glomerulonephritis is the commonest cause of ESRD accounting for 47%[1]. Clinical diagnosis of specific glomerular diseases is difficult because the same glomerular disease can manifest in different ways. Renal biopsy plays a fundamental role in the evaluation of patient with haematuria and proteinuria. But it is an invasive, expensive, time consuming procedure, with some limitations and complications and can be performed only in hospital admitted patients. In clinical practice, one needs a relatively simple, affordable technique, with a reasonable degree of sensitivity and speciûcity to diagnose glomerular diseases. The examination of urinary sediment is a diagnostic tool introduced into clinical practice for more than 150 years and maintains its utility till today. Haematuria is a clinically significant finding associated with a number of diseases including those of kidney, ureter, prostate, bladder and urethra[2]. Depending on the source of bleeding, haematuria can be classified as glomerular or dysmorphic red cells and non- glomerular or iso-morphic red cells[3]. Phase contrast microscopy is an accepted technique for evaluation of urinary red cell morphology throughout the world [4, 5]. The morphology of urinary red cells by phase-contrast microscope (PCM) is not so popular in our country. Possibly because lack of sufficient expertise in this field and specialized phase contrast microscope is needed for this technique. The morphology of urinary red cells also can be examined by stained urinary sediment like Papanicolaou stain (PS), Wright stain etc [6]. The technique of Papanicolaou stain is relatively simple, affordable, non-invasive test that can be performed in out door patients[7]. Also the advantage of this stain is that, urinary sediment can be fixed on the glass slide and preserved with stained preparations for several years. G l-cells are the special type of dysmorphic red cells those have the shape of a doughnut with target configuration and membranous protrusions or blebs. These cells are regarded as a marker for glomerular haematuria[6.] Various report showed, Gl-cells are more sensitive and specific than the percentage of dysmorphic erythrocytes in detection of glomerular bleeding[5,8]. So far we know, this kind of study was first time in Bangladesh. The value of urinary dysmorphic red cells and G1 cells count by Papanicolaou stain in the diagnosis of glomerular diseases was evaluated in this study.

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Materials and Methods

The study was done from October 2007 to July 2008 in the Department of Clinical Pathology and out patient Department of Nephrology, Bangabandhu Sheikh Mujib Medical University, Dhaka. A total of 120 patients were included in this study with haematuria (>3 RBC/hpf) [9] and proteinuria. All the patients were 15 to 60 years of age, with no evidence of associated systemic diseases and coagulopathy. Fresh midstream urine samples (10- 15 ml) of 120 patients were examined within 2 h of collection without knowing the clinical diagnosis at the outset. The reagent strips were used for the detection of protein and glucose in urine. For microscopic examination, 5 ml of urine was centrifuged in a conical tube for 10 min at 2000 RPM. After centrifugation, the supernatant was discarded and resuspended the sediment in a few drops. A drop of well mixed sediment was placed on a clean glass slide and covered with a cover slip. Another smear was prepared from each sample. The smears were immediately fixed in 95% ethyl alcohol and stained with Papanicolaou stain (PS) according to the standard method. In both cases of PS stain and direct light microscopy, the slide was first screened and casts were examined by low power objective. The high power objective was used to see the morphology of red cells. The morphology of red cells were classified as dysmorphic red cells with irregular size, variable shape with vacuole, areas of loss of membrane or destroyed forms of membrane and iso-morphic red cells with uniform size, shape with smooth outline[10].

The crenated cells were not counted. The G1 cells were also noted separately (Fig.-1)

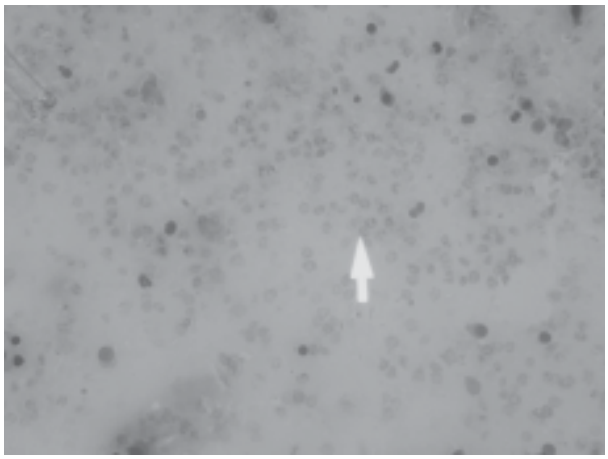

Fig.-1: *Numerous dysmorphic red cells with few G1 cells by Papanicolaou stain.*

G1 cells are dysmorphic red cells those have the shape of a doughnut with target configuration and membranous protrusions or blebs. The percentage of dysmorphic red cells and G1 cells were calculated in each sample in minimum average of ten high power field. Renal histopathology was used as the gold standard method for the diagnosis of glomerular diseases. Each case of haematuria was diagnosed by standard clinical, biochemical, bacteriological, radiological investigation.

Statistical analysis

Data were analyzed using computer based statistical package, SPSS. For statistical analysis unpaired student's t-test, chi-square, Pearson's correlation coefficient test were performed. Sensitivity, specificity and Kappa analysis were used to assess reliability and to compare the results obtained by PS stain with the final diagnosis. Significance was assumed at P value of <0.05.

Results

The cases were divided into group-I and group-II on the basis of percentage of dysmorphic red cells in urine. Group I, regarded as glomerular group with > 20% dysmorphic red cells & 81 patients were included. In group II (non glomerular group), 39 patients were included with $\leq$ 20% dysmorphic red cells. The mean distribution of dysmorphic red cells of group-I was 53.8 ± 15.2 (range 21-85%) which was significantly higher ($p<0.0001$) than that of the group-II, 11.0 ± 3.4 (range 01-20%). G1 cells (ranging from 01% to 10%) were found in 46 patients of group-I and 3 patients of group-II. The correlation coefficient between dysmorphic red cells and G1 cells was statistically significant ($r = 0.511$).

A significant differences ($P<0.001$) in number of casts were found between two groups of patients. PS detected more casts than direct light microscope (DLM) in both groups of patient (Table-I). Granular casts were seen by PS in 37% patient, and by DLM 24.7 % of group-I patients. In group-II, in 5.1% patient casts were seen by PS, and in 5.1% by DLM. PS identified cellular casts in 49.4% patient and in 30.9 % by DLM of group-I. These values are 30.9%, only 10.3% respectively for group-II patients (Table-I).

Table-I

Distribution of casts by PS and DLM in two groups of patients

Modality	Group-I		Group-II	
	Granular cast	Cellular cast	Granular cast	Cellular cast
	(% of patient)		(% of patient)	
PS	37	49.4	5.1	17.9
DLM	24.7	30.9	5.1	10.3

PS- Papanicolaou stain, DLM- Light microscope.

In group-I out of 81 patients, glomerulonephritis were clinically diagnosed in 76 cases and non glomerular diseases in three cases, diagnosis were not confirmed in two cases. Glomerulonephritis confirmed in 38 cases by renal biopsy in this group. The diagnosis of group-I patients were shown in (Table-II).

Table II

Diagnosis of group I (glomerular group) patients.

Diagnosis	Number of patients
A: Histopathological diagnosis	38
Diffuse mesangial proliferative GN	12
Focal & segmental proliferative GN	08
Membranous GN	03
Minimal change disease	02
Focal & segmental glomerulosclerosis	03
Chronic sclerosing GN	03
Mesangiocapillary GN	02
Interstitial Nephritis	03
IgA nephropathy	02
B: Clinical diagnosis	
Clinically diagnosed as GN	38
Undiagnosed	02
Nephrolithiasis	02
Renal cyst	01
Total	81

GN- GlomerulonephritisIn group-II, non glomerular causes of haematuria diagnosed clinically in 34 patients (One case of carcinoma bladder was confirmed by renal biopsy). Clinically glomerulonephritis were diagnosed in five cases and diagnosis were confirmed in three patients by renal histopathology (Table-III). No positive conclusion were made in 2 cases due to inadequate specimen and regarded as negative biopsy for glomerular diseases.

There was statistically significant difference ($P<0.0001$) in protein status between group I and group II patients. In group-I , 46.91% patient had (++) and 28.39% had (+++) proteinuria. In group-II 46.15% had (+) and 25.64% had (++) proteinuria. Also there was a positive correlation between dysmorphic red cells with protein status of the patients ($r= 0.117$).

Table-III

Diagnosis of group II patient (Non glomerular group)

Diagnosis	No. of patients
Urinary tract infection	10
Nephrolithiasis	10
Renal cyst	07
Cystitis	04
Hyperplasia of prostate	02
Carcinoma of bladder	01
Minimal change disease	02
Membranous GN	01
Inadequate specimen for biopsy	02
Total	39

Reliability parameters accuracy, sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) were calculated on biopsy finding of the patients. Dysmorphic red cells seen by PS method predicted 35 cases correctly out of 41 biopsy positive glomerular disease cases. Non glomerular diseases were correctly predicted by PS in all of 3 cases (Table IV).

Table IV

Association between dysmorphic red cells with biopsy findings by PS method. (n=44)

Dysmorphic red cells	Biopsy Positive for glomerular disease	Biopsy Negative for glomerular disease	Total
Positive for glomerular disease	35	0	35
Negative for glomerular disease	6	3	9
Total	41	3	44

PS- Papanicolaou stain

Result from PS showed a sensitivity of 85.4%, specificity 100% and accuracy 86.4 %, PPV 100%, NPV 33.3% by counting dysmorphic red cells and statistically, moderate agreement was found by Kappa analysis ($K=0.44$) between the biopsy results and dysmorphic red cells count. In this study ≥5% G1 cells were counted as a marker of glomerular haematuria. G1 cells seen by PS method correctly predicted

37 cases out of 41 biopsy positive glomerular disease. Four cases were not correctly predicted by G1 cells. Non glomerular diseases were correctly predicted by G1 cells in all cases (Table V).

Table V

Association between G1 cells with biopsy findings by PS method. (n=44)

G1 cells	Biopsy Positive for glomerular disease	Biopsy Negative for glomerular disease	Total
Positive for glomerular disease	37	0	37
Negative for glomerular disease	4	3	7
Total	41	3	44

PS- Papanicolaou stain

PS method also showed sensitivity of 90.2%, specificity 100% and accuracy 90.9 %, PPV 100%, NPV 42% by counting G1 cells. Statistically, moderate agreement was found by Kappa analysis (K= 0.56).

Discussion

Spectrum of renal disease varies significantly in different parts of the world as it is influenced by geographical, environmental and socioeconomic factors in that region. Glomerular disease presents with abnormalities of the urine, oliguria, often with hypertension, oedema and/or impaired excretory renal function[11]. Patient frequently present with haematuria in the out patient department of hospitals. Examination of the urine in patients with haematuria is essential, preferably before a patient is referred to a medical specialist. One of the study showed 25% of patient could have spared from extensive urological investigation, if the examination of urinary sediment would have been performed at the start of evaluation[12]. Examination of urine can be performed by bright field microscope and also by more sophisticated phase contrast microscope (PCM). In a developing country like Bangladesh, it is very much important to introduce simple, cost effective & low risk technique in the investigation protocol of a disease.

This study showed the value of dysmorphic red cells and G1 cells count as a diagnostic tool for glomerular diseases by PS method. Result from this method showed a sensitivity of 85.4%, specificity 100% in the diagnosis of glomerular diseases by dysmorphic red cells count while by the G1 cells count sensitivity of 90.2%, specificity of 100% were observed. Only the out door patients were included in this study and renal histopathology was taken as a gold standard for diagnosis of glomerulonephritis. In all the cases, renal histopathology was not indicated and some patients refused to go through renal biopsy. So in detection of sensitivity and specificity it was not possible to include all the patients.

Brich and Fairly in 1979 first described a method of differentiation between glomerular and non-glomerular haematuria by examination of urinary red cell morphology using phase contrast microscope[3]. A large number of techniques have been tried for detection of the dysmorphic red cells suggestive of glomerular haematuria. The techniques are phase-contrast microscopy[4],bright-field microscopy with or without staining[5,6,13], automated urine analysis[14]. Apart from bright-field microscopy with or without staining, other techniques are time-consuming and some of them require costly equipment. However, few people have sufficient expertise in the examination of the urinary sediment by a sophisticated method like PCM to identify dysmorphic red cells. Freshly voided urine is required to examine by PCM, as the morphology of urinary red cells usually change within 2- 4 hours of voiding. The advantage of Papanicolaou stain is that, urinary sediment can be fixed on the glass slide and preserve with stained preparations for several years. So in case of delay in examination, it can be stored at room temperature, which enables sending of a fixed slide to an expert examiner and also evaluation can be repeated if necessary. Also this technique is relatively simple and affordable.

The exact cause of dysmorphic red blood cells in urine is not known yet. The dysmorphic erythrocytes appear in the urine when the physiological barrier of the glomerulus is disrupted. It is thought to be the result of environmental changes that the cells are exposed through. During their course, the erythrocytes undergo alterations in shape. A study was reported, a combination of mechanical damage upon squeezing of red cells through the glomemlar membrane followed by exposure to the changes of osmotic environment when cells pass through the tubular system[15].

The result of this study showed the diagnosis of glomerular diseases could be done with accuracy of 86.4% for dysmorphic red cells and 90.9% for G1 cells count using PS method. We selected the cut-off value of 20% for dysmorphic red cells and applying this cut-off value, sensitivity of 85.4% and specificity of 100% were achieved

for this approach. Few studies are available regarding the staining of red cell morphology. They reported sensitivity (82%- 86.5%) and specificity (97%- 100%) with a cut-off value of 20% for dysmorphic red cells[5,6,12]. The diagnostic cut-off value for dysmorphic red cells are widely variable ranging from 20%- 80% [3,4,16]. But in case of G1 cells, the cut off value does not vary that much which is around 5%. The cut off value of G1 cell was selected 5% in this study and sensitivity of 90.2% with 100% specificity was found using Papanicolaou staining. Dinda *et al*. and Lettgen and Wohlmuth had reported G1 cells with 100% sensitivity and 100% specificity for the detection of glomerular haematuria (≥5% cut-off value)[6,7]. Fogazzi *et al.* reported 92.9% sensitivity (>5% cut-off value) for G1 cells in patients with isolated microscopic haematuria[17].

In conclusion, we found the Papanicolaou staining of urinary sediment is a sensitive method in the diagnosis of glomerular hematuria. So where the facilities of PCM is not available, simple and affordable PS method can be used to diagnose the presence of glomerular diseases by dysmorphic red cells and G1 cells count in urine. The percentage of G1 cells is superior to counting dysmorphic red cells in the diagnosis of glomerular hematuria . This simple, cost effective, non invasive test do not lead to a definite diagnosis, but enable the selection of the most appropriate test and thus avoid unnecessary, often invasive diagnostic procedure.

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Histopathological Patterns of Lupus Nephritis Patients in A Teaching Hospital

AKMM ISLAM, E ALAM

SLE is a disease causing many organ involvement such as joints, heart, lung, kidney, CNS, in which renal involvement is one in the severe injuries of lupus. Renal involvement in SLE can be manifested as hematuria, proteinuria, nephritic syndrome and or renal failure. Prognosis of lupus patients having renal involvement is bad and have a lot of difficulties in treatment, particularly if patients have nephritic syndrome. This study was carried out to see the renal histological patterns in patients presented with various features of renal involvement in lupus.

This prospective interventional study was carried out in the Department of Nephrology, Rajshahi Medical College and Hospital. Written consent was taken from each patients or from their guardians. Total 30 patients suffering from SLE having renal involvement were included in this study to know the exact histological pattern of GN in lupus nephritis.

Age range of the patients were 10 to 40 years, (Mean ± SD) age was (25.23 ± 7.66). Females were predominant in number 26 (86.67 %). Regarding ARA criteria malar rashes, photosensitivity and renal involvement were present in all the patients i.e.30(100%). ANF was positive in 28 (93.33%) cases. Anti-ds-DNA was positive in 16 (53.33%) cases. None of the patients had neurological disorders.

Considering modified WHO classification of lupus nephritis, class IV was the most common 15(50%), followed by Class I - 04(13.33%), Class II - 04 (13.33%) and class III - 04 (13.33%). Only 02 (6.67%) patients were in class VI and 01 (3.33%) was in class V.

It is concluded that class IV is the predominant histological type in patients with lupus nephritis in this study.

Prevalence of Diabetes Mellitus, Hypertension and Proteinuria and Chronic Kidney Diseases in Health Service Providers

KBM HADIUZZAMAN, HU RASHID, S DAS

Chronic Kidney Disease (CKD) is a major public health problem associated with considerable increase in morbidity & mortality worldwide. To slow or prevent the consequences of Chronic Kidney Diseases it is important to find out the prevalence of risk factors of CKD like diabetes mellitus, hypertension and proteinuria and maximize their care. This study was conducted among health service providers in a Medical University of Dhaka Metropolitan City to know the prevalence of diabetes mellitus, hypertension, proteinuria and chronic kidney disease.

This cross sectional study was conducted from June 2005 to March 2007 among health service providers in a Medical University of Dhaka Metropolitan City. A total of 1200 adult participants of both male and female were included between 18 to 65 years of age. Blood pressure was recorded in all participants with sphygmomanometer. Venous blood samples were collected for random blood sugar and serum creatinine estimation. Spot urine samples were tested with dipstick for detection of proteinuria. Prevalence of Chronic Kidney Disease was detected by using both the Cockcroft-Gault and MDRD equation.

A total of 1200 participants of between 18 and 65 yrs of age were included in this study. Among the participants 623(52%) individuals were male and 577(48%) were female. Mean age of the participants was (35.5±8.8) yrs. Among them, 54(4.5%) individuals were found diabetic in which 24(3.8%) were male and 30(5.2%) were female. 2.4% (24) of the diabetic patient was ?40 yrs of age and 10.8% (30) was >40 yrs. Among diabetic individuals, 53(98.1%) were aware of diabetes. Out of 53 known diabetics 38(71.7%) were on regular anti diabetic agents and of them 30(79%) achieved control over the disease. Among 1200 participants, 207(17.3%) individuals were hypertensive in which 109(17.5%) were male and 98(17%) were female. In this hypertensive group 115(12.5%) individuals were ?40 yrs of age and 92(32.3%) individuals were >40 yrs of age. Among hypertensive, 105(51%) were aware of hypertension and of them, 96(91.0%) were on antihypertensive agents and achieved control in 65(68%) individuals. Among participants, 34(2.9%) individuals were proteinuric in which 11 were diabetic and 17were hypertensive. Among the participants 119(9.9%) individuals fall into different stages of CKD as per Cockcroft-Gault equation and 86(7.2%) individuals fall into different stages of CKD as per MDRD formula.

This study revealed that the prevalence of diabetes mellitus is 4.5%, hypertension 17.3%, proteinuria 2.9%.The prevalence of Chronic kidney disease(CKD) is 9.9% as per Cockcroft-Gault equation and 7.2% as per MDRD formula.

Single Stage Buccal Mucosal Urethroplasty - A Revolutionary Technique

M NASIR UDDIN , AKMZI BHUIYAN , KR ABEDIN, MK ISLAM, MA HOSSAIN

Stricture urethra is a common & chronic urological problem. Several options are there for their management, but all of these techniques are associated with high recurrence rate except buccal mucosal urethroplasty. We used this technique for management of patient with bulbar and penile urethral stricture.

To find out the use and efficacy of buccal mucosal graft for urethroplasty.

This retrospective study was conducted on 42 male patients that underwent BMG at National Institute of Kidney Diseases & Urology (NIKDU), from Jan 2004 - June 2008, with mean age 37 yrs. (range 22-68 yrs). All strictures were located at bulbar and penile urethra with mean stricture length was 3.5cm (range 2.5-Scm). Etiology of stricture was infection in 32 cases, trauma in 8 cases and idiopathic in 2 cases. All patients were evaluated preoperatively & postoperatively with history, clinical examination, uroflometry, retrograde & voiding urethrogram. Follow up period was 3-32 months.

Overall success rate was 85.71% (36 patients) and only 6 patients (14.28%) had restricture; these patients were managed by Optical Internal Urethrotomy (OIU). Out of 42 patients 2 patients had leakage of urine at repair site which was managed conservatively.

BMG is a gold standard technique for management of long segment bulbar & penile stricture urethra provided use of loupe, appropriate suture and good quality catheter.

Prevalence of Diabetes Mellitus, Hypertension And Proteinuria In A Rural Area of Bangladesh

MO FAROQUE, MA MUQUEET, HU RASHID, F KHAN, MM RAHMAN, ALAM, AA CHOWDHURY, SI SELIM

This study was designed to detect the prevalence of diabetes, hypertension and proteinuria in a rural area of Bangladesh as these are the most common causes of CKD. Result of this study may give some idea about the prevalence of these three conditions as a whole among the rural population of Bangladesh. In this prospective cross sectional study 1265 adult subjects were included. The mean age was 35.57 ± 12.98 years, 63% were female, and 85% were married. Prevalence of Diabetes was about 4%, of them 49% self reported and 51% detected during the survey. Among self reported cases only 48% were on regular treatment and of them 73% had control of diabetes. Mean plasma glucose among uncontrolled diabetic was 11.90 ± 3.80 mmol/l in self reported cases and 16.71 ± 5.6 mmol/l in newly diagnosed cases. Prevalence of hypertension was 19%, of them 35% were self reported, 65% detected during the survey. Among the self reported cases 43% were taking medication and of them only 25% had optimum BP control. The mean systolic and diastolic BP of self reported cases was 160 ± 26 mmHg and 92 ± 10 mmHg respectively and in newly diagnosed cases 152 ± 13 and 87 ± 9 mmHg respectively. Regarding proteinuria, total 76 (6%) cases were found to have proteinuria of different grades. Among them 31.6% had hypertension, 15.8% had DM and 11.9% had combined DM and hypertension. All these three conditions were found to be significantly higher in middle aged and elderly (40 years & above). Participants (both male & female) with single or multiple risk factors had significantly low eGFR compared to their normal counterpart. As majority of the people remain undiagnosed it will increase the burden of CKD and on the other hand prevalence of these three condition will help to define strategies that can identify early enough those subjects who are at risk of developing renal failure later in life.

Family Attitude of Brain Death Patients Towards Kidney Donation

M SAHA, HU RASHID, MH RAHMAN, AKMK HUDA, IH CHOWDHURY

In Bangladesh cadaver renal transplantation is not yet started. To see the prospects of cadaver renal transplantation, we investigated family attitude of brain death patients towards kidney donation and identified eligible cadaver kidney donor in intensive care unit of Bangabandu Sheik Mujib Medical University, Dhaka, Bangladesh. In this study total 60 critically ill patients were included during 12 months study period. The patients were thoroughly evaluated and then families were approached for kidney donation. Afterwards investigations were done for final assessment. Sixty percent of critically

ill patients were declared brain dead during study period. Among them 94.5% families of brain death could be approached. Only 14% families were willing to donate kidney. Suitable kidney donor was 66.6% among brain death patients and rest had medical contraindications. 25.4% of brain death patients had renal disease for which thery were unsuitable for kidney donation. Family attitude of brain death patient towards organ donation was low (14%). Hence, Cultural and social campaign should be started as early as possible to improve attitudes towards organ donation.

Diabetes, Blood Pressure and Kidney Disease Detection Survey-Primary Data From A Multicenter Population Screening Program

MM IQBAL, AA CHOWDHURY, DK ROY, RM HOSSAIN, AH AHMED, M MOHSIN, N CHOWDHURY, M RAHMAN, AKMM ISLAM, F KHAN, S AHMED

Incidence of diabetes and kidney disease is increasing many folds than expected. As majority of the world population resides in developing part, it is projected that the epidemic of these diseases will hugely burden their health service system. Creating awareness and detecting at an early stage can greatly reduce the morbidity and mortality associated with these non communicable diseases. The aim of this survey was to identify prevalence of diabetes, hypertension and renal impairment in a previously nonscreened population from cluster samples of different parts in Bangladesh.

This screening program was undertaken in five different parts of the country. As this was a pilot survey, a minimum sample size was calculated .Any person 18 years and above and not known or treated for diabetes, hypertension and kidney disease, was eligible for screening. After collecting demographic data, 2 separate blood pressure measurement was made to average. Spot urine was checked for albumin and sugar; and presence of proteinuria was taken as evidence of structural kidney damage (dipstick 1+ or more).A blood sample was collected for random blood sugar and serum creatinine.Esmitaded GFR (eGFR) was calculated from MDRD equation and subjects were categorised as mild, moderate and severe renal impairment based on eGFR.

Total 1136 subjects were evaluated. Among them 4.5% were known diabetic and 9.4% were hypertensive. After excluding them finally 1003 were analyzed of which 65.5% was male. Age group 40-50yrs consisted of 20%, 50-60yrs consisted of 10 % , > 60yrs consisted of 1% and rest from 18-40yrs. Initial BP measurement showed 81% were nomotensive and 19% had raised blood pressure either systolic (4%), diastolic (3%) or both (12%).Diabetes was detected (random blood sugar ?11.1 mmol/l) in only 2% subjects. Sugar level was normal in 73% (<5.6mmol/l) and doubtful about diabetes in 25% (5.6-11 mmol/l - requiring OGTT for confirmation of diagnosis). Proteinuria was detected in 5.1% subjects (1+ in 4.2%, 2+in 0.5% and 3+ in 0.4%). Then eGFR was calculated by serum creatinine values estimated in different laboratories of participating centres and this was compared to the values remeasured in a central laboratory after standardization. This showed proportion of severe renal impairment (eGFR 15-29.9 ml/min/1.73m2) was 0.8 vs. 0.1%; moderate impairment (eGFR 30-59.9) 15.6 vs. 8.9% (P<0.001) and mild impairment in 1.3 vs. 1.4 %. A significantly over estimated percentage of renal impairment, especially of moderate stage, was seen in calculations by non standardized creatinine values. Association studies showed age had strong negative influence on renal function and the mean age at mild and severe renal failures were 37±7 and 41±8 yrs respectively.

The prevalence of likely diabetes was 2%, hypertension 19%, proteinuria 5.1% and renal impairment 10.4% in this screening population. The susceptible age for renal involvement ranged from 37-41 years. The results of this screening should be interpreted with caution keeping in mind that these have to be confirmed by subsequent repeat measurement.

Lack of Association of Ins Vntr With Type 2 Diabetes in Overweight to Obese Subjects in A Bangladeshi Population

Z HASSAN, M RAHMAN, I KHAN, M IQBAL, N CHOWDHURY, L ALI

Background and Aim: Pathogenesis of type 2 diabetes still remains to be clearly understood. The primacy between insulin resistance and secretion in the pathogenesis of diabetes still debated. Insulin gene variable tandem repeat reported to be associated with its expression. The present study was undertaken to determine insulin gene VNTR variant genotype in type 2 diabetes mellitus in a Bangladeshi population and explore its association with obesity and insulin secretion.

Subjects and Methods: A total number of 111 T2DM patients and 251 healthy controls were recruited. Oral glucose tolerance test was performed. Blood glucose was

measured by glucose-oxidase, lipid levels by enzymati-colorimetric, creatinine by alkaline picrate method. Insulin was estimated by enzyme linked immunosorbent assay (ELISA). DNA was extracted using QIAGEN spin column kit. INS VNTR T>A variant was determined by PCR-RFLP using restriction enzyme HphI. Data were managed using Statistical Program for Social Science (SPSS). Unpaired Student's 't' test and Chi-squared tests were performed where appropriate.

Results: The INS VNTR A>T genotype frequencies in the controls were 0.690, 0.254 and 0.056 for homozygous wild, heterozygous variants and homozygous variants respectively and, 0.731, 0.250 and 0.019 in the T2DM subjects which appeared to be of almost similar frequency. Absolute insulin level (mean±SD) between the Controls and T2DM did not show significant difference. Anthropomentric measurements, BMI and body fat mass did not show statistical significant difference between the Control and T2DM. Subjects with wild and variant genotype either in the Controls and T2DM did not show significant difference regarding circulating insulin, BMI and BFM. However, WHP was found to be significantly higher among subjects with variant INS VNTR genotype compared to those with wild in the Controls (p=.003). The difference in the T2DM did not reach to the level of significance (p=0.08).

Conclusions: The data suggest that INS VNTR variant genotype: (i) is not associated with circulating insulin in the controls and T2DM; (ii) is not associated with type 2 diabetes in Bangladeshi population; and (iii) seem to have an association with central obesity in our population.

Liver Function in HBV & HCV Positive Patients Receiving Haemodialysis

LT. COL. MAMUN MOSTAFI, ADNAN BULBUL, KAISER JAHAN, BRIG. GEN. MD. RABIUL HOSSAIN , MAJ. GEN M G RABBANI

In spite of the progress made in the prevention of transfusion related infections over the last few years, the incidence of HBV & HCV infection in dialysis patients remains high throughout the world.

Objectives: To assess the liver function in HBV & HCV positive hemodialysis patients.

Materials and Methods: 74 hemodialysis patients who had been receiving regular hemodialysis were enrolled in this study. All patients' blood samples were tested for HBV & HCV. Patients who were positive of either HBV or HCV were thoroughly evaluated, there duration of haemodialysis, frequency of dialysis, number of transfusions, duration of HBV & HCV positivity were documented. Detail clinical examination was done. Liver function tests which include serum bilirubin, alanine amino transferase (ALT), alkaline Phosphatase, serum albumin and protrombin time were estimated. Ultrasonography was also done in all patients.

Result: Among our 74 patients, 23% were seropositive either for HBV or HCB. HCV was positive in 13%, HBV was positive in 06%, HBV & HCV were co-existent in 03% patients . Among seropositive patients 17% patients have clinical evidence of CLD, 76% have` abnormal LFT & 47% have positive ultrasonographic findings suggestive of CLD.

Conclusion: This study reflects a high incidence of abnormal liver function in HBV & HCV positive hemodialysis patients.

Analysis of Water Quality in Different Hemodialysis Centers of Bangladesh

AK SHAHA, HARUN-UR-RASHID, MH RAHMAN, MR ALAM, S ISLAM, Z KABIR

This study was performed to asses the bacteriological and chemical quality of both tap and treated water used in different hemodialysis centers of Bangladesh.

In this cross sectional study water samples of 6 hemodialysis centers in 5 divisional city of Bangladesh namely Dhaka, Chittagong, Rajshahi, Sylhet and Khulna were included. Among these centers two were in Dhaka Metropolitan City and others were in each of the other cities. One sample of tap water and one sample of treated water were analyzed from each of the center. Bacteriological quality of water was assessed by using tryptic soy agar in pour plate method. Among chemical elements calcium, magnesium, arsenic were measured by atomic absorption spectrophotometry. Aluminum, total chlorine, free chlorine was measured by colorimetric method.

Tap water used in one dialysis center of Dhaka Metropolitan City and one from Rajshahi Metropolitan City were highly contaminated with bacteria (2570 and 9180 CFU/ml respectively). After treatment bacteria count in dialysis center of Dhaka Metropolitan City reduced to AAMI standard.

But treated water of Rajshahi exhibited a much higher bacterial count (7200 CFU/ml). Tap water and treated water of other centers were within normal standard. 67% of tap water and 80% of treated water complied bacteriologically with AAMI standard.

The level of aluminum in treated water of Rajshahi and Sylhet was 10 and 2 times higher than desired AAMI standard respectively. Calcium in treated water of Sylhet center was almost double that AAMI standard. Total chlorine, chloramine, arsenic and magnesium in both tap and treated water were within the standard limit.

It can be concluded that water quality of treated water in dialysis centers of Bangladesh both bacteriologically and chemically needs more attention.

Relationship Between Birth Weight of Newborn Baby & Kidney Volume

N I CHOWDHURY, S KHATUN, F K BHUIYAN, K SHAHA, H RAHMAN, H U RASHID.

Chronic kidney disease is an important cause of mortality & morbidity in Bangladesh. Approximatly 10 million peoples are suffering from some form of kidney disease in our country. Among them 20,000 peoples develop ESRD every year. Low birth weight (LBW) of a baby predisposes to renal disease, hypertension, diabetes & cardiovascular diseases in the adulthood. This could be due to reduced nephron number which might be reflected in lower kidney volume in early life. Reported prevalence of LBW baby in our country (23-60) % is very high. In this study 401 newborn babies were evaluated to find out relationship between birth weight of new born baby & their kidney volume.

Total 401 newborn babies were included in this study who were divided into two groups, low birth weight (<2.5 Kg) - 133 & normal birth weight (2.5 Kg) - 288. Information was collected on parent demographics & other factors known to affect fetal growth. Kidney dimensions were measured by ultrasound on a single occasion by one sonologist. Kidney volume (Kv) was calculated from the formula- Kv (ml) = Length X Width X Depth X 0.52.

Mean birth weight of the study population was 2.8 kg & 28% was LBW. Mean birth weight of male babies was significantly higher than female babies (2.9 0.55kg versus 2.79 0.48 kg, $p < 0.05$). The combined kidney volume was 17.9± 3.98 (ml) in LBW group & 23.14±4.6 ml in NBW group ($p < 0.001$).

From this study it can be concluded that renal volume of LBW babies are significantly lower compared to normal birth weight babies.

Independent, Non-Traditional Risk Factors for Cardiovascular Events And Atherothrombosis in Chronic Kidney Disease And Hemodialysis Dependent Patients

R DASGUPTA, MM RHAMAN, MN CHOWDHURY

Chronic kidney disease is a worldwide public health problem. The risk for death from cardiovascular event are 1.8 times greater for persons with an estimated glomerular filtration rate (eGFR) of less than 70 ml/min/1.73 m2 than for those with a GFR of 90 ml/min/m2 or more after adjustment for age, race, sex, systolic blood pressure, serum total cholesterol level, body mass index, diabetes, family history of cardiovascular disease, physical activity and level of education. Non-traditional risk factor such as elevated level of homocysteine, fibrinogen, Factor VII, C-reactive protein has been shown to be associated with an increased risk for cardiovascular disease. This study aims to see the incidence of non traditional cardiovascular risk factors among chronic kidney disease patients.

This cross sectional study involved 86 Bangladeshi persons including 22 haemodialysis dependent, 48 Non-dialysis CKD patients and 16 were non-diabetic, non-hypertensive healthy control monitored at the in-patients department of nephrology and hemodialysis unit for at least one year. The patients were divided into groups according to presence or absence of cardiovascular events in healthy control group, non- dialysis CKD and hemodialysis group. Groups were compared by suitable statistical tests. To determine the best predictor and independent variables of cardiovascular events, multiple logistic regression and odds ratios was applied.

All participants of the study were Bangladeshi, mean age of 47.26± 12.20 SD years. Among the non-dialysis CKD patients, mean age 49±13.57 years. 29.2% (14) smoker, 37.5% (18) diabetic, 87.5% (42) were hypertensive, 52.1%(25) had IHD, 10.4%(5), 2.1% (1) and 27.1%(13) had stroke, peripheral vascular disease and heart failure respectively. 18.8% (9) were on lipid lowering agent. Hemoglobin, Fibrinogen, CRP, Factor VII, and Homocysteine level were 8.08±1.94 gm/dl, 264.10±67.81mg/dl, 103.97±14.41%, and 22.99±8.70¦mol/L. In haemodialysis dependent patients mean age 46.23±12.39 years. 31.8% (7) smoker, 31.8% (7) diabetic, 88.6% (19) were hypertensive, 59.1%(13) had IHD, 4.5% (1) and 31.8%(7) had peripheral

vascular disease and heart failure respectively. 27.31% (6) were on lipid lowering agent. Hemoglobin, Fibrinogen, CRP, Factor VII, and Homocysteine level were 9.46±1.87 gm/dl, 259.59±60.92mg/dl, 106.18±14.64%, and 23.76±9.15¦mol/L.

Mean age of control healthy group 45.75±5.23 years. Mean hemoglobin, CRP, Fibrinogen Factor VII, and Homocysteine level 13.49±1.51 gm/dl, 3.80±1.03mg/L, 184.25±42.91 mg/dl, 94.18±12.66% and 16.25±4.01¦mol/L respectively.

This study clearly showed that along with tradiational risk factors incidences of non-traditional cardiovascular risk factors like anaemia, hyper-homocystenaemia, hyper-fibrigenomia, increased level of CRP and factor VII activity also significantly higher in both pre-dialysis CKD patients and hemodialysis dependent patient compared to healthy controls.

Hematological Changes In Hemodialysis

MAMUN MOSTAFI, THAZAN NU AUNG

The objective of the study was to assess the various hematological changes that occur in renal failure patients after hemodialysis sessions, as well as to assess the effect of cellulosic dialysis membranes on the production of acute phase reactants.

The study was carried out at the Nephrology department, CMH Dhaka. Blood samples were collected from 50 renal failure patients undergoing hemodialysis before and after dialysis sessions. The samples were tested for complete blood count, Plasma C3 and Plasma CRP by the manual calibrated techniques. The study demonstrated an increase in mean hemoglobin (10.71 from 9.7 gm/dl) and hematocrit (0.31 from 0.29) after hemodialysis. Mean leukocyte count also showed a mild increase (5300 vs 5000 9/L) while platelet count decreased (1,60,000 vs 1,76,000 1O9/L) after hemodialysis. The mean C- reactive protein (CRP) levels were raised before dialysis (12 mg/L) which was found to be reduced (8.9 mg/L) after dialysis. There was mild reduction in Plasma C3 levels also (1354 from 1384 mg/L).In this study we could not detect any evidence of acute phase reaction in the process of dialysis.

Prevalence of Diabetes Mellitus, Hypertension, and Proteinuria In adult Disadvantaged Population

KS ALAM, HU RASHID, MM RAHMAN, MN HUDA

Diabetes Mellitus and Hypertension have posed a serious threat to entire population of the world irrespective of stages of industrialization. Glomerulonephritis is a major cause of CKD in the developing world. This study was carried out to estimate the prevalence of diabetes, hypertension and proteinuria in a socially and economically deprived population of Bangladesh. In this cross sectional study 1000 adults both male and female were included. The study was carried out among urban slum dwellers of Dhaka city . Mean age was 34±12.7 years. 334(34.4%) were male and 666(66.6%) female. Prevalence of diabetes was found 4.1%. Of them 2% were self reported and 2% were detected during the study. 45% of the known diabetic was on drugs and of them 50% had good control of diabetes. Prevalence of hypertension was found 11.6%. 5% were self reported and 6.6% were diagnosed during the survey. Half of the self reported hypertensive patients were under medication and of them 80% had optimum blood pressure control. A total of 77(7.7%) participants were found to have proteinuria. All these three conditions were found to be significantly higher in middle aged and elderly (40 years & above) people. Proteinuria was found more commonly in males. The prevalence of Diabetes, Hypertension and Proteinuria in disadvantaged population is as high as national and other regional prevalence. A vast majority of people remained undiagnosed which will increase the burden of CKD.

Family Member's Aid Is The Staple Source To Bear The Maintenance Hemodialysis Cost of Majority ESRD Patients: An Audit at The Nephrology Department of Chittagong Medical College Hospital

MA KASHEM, DIPTI CHOWDHURY, EMRAN BIN YUNUS, SAIBAL DAS, NURUL HUDA.

Hemodilysis is the most common method used to treat the patients with end stage renal disease (ESRD). It is well known that economic status is the prime concern in planning and continuing this modality of treatment. In majority cases, patients and their parties have been taking the decision of dialysis treatment emotionally ignoring the real economic status. We have undertaken this study to know the source of maintenance hemodialysis cost of ESRD patients who have been taking hemodialysis treatment in our dialysis center. Twenty ESRD patients (M =16, F= 4) who have been on maintenance hemodialysis (dialysis tenure; 01- 62 months) are interviewed with a pre-designed questionarie form after obtaining consent. Only 6 (30%) patients using erythropoietin for renal anemia and only 02 (10%) patients

have a plan for renal transplantation. The revealed source of maintenance hemodialysis cost in our 20 ESRD patients is as follows: i) family members aid in 10 (50%) patients, ii) propriety sale in 06 (30%) patients, iii) personal business in 02 (10%) patients, and iv) service in 02 (10%) patients. Although the dialysis cost at our center so far is the lowest rate (Tk. 5001= per session) in the country, still 30% patients can not pay their full payment of dialysis on due date.

As the maintenance hemodialysis cost is extremely high in respect of our per capita income and there is very limited resource in the Government or charitable funds, only a few percentages of ESRD patients are capable to survive timely by their own management of maintenance dialysis cost. It is possible to save the millions lives of renal failure patients if the treatment can only be affordable with subsidized cost which might be feasible through cooperation between the Government, general population, and nongovernment organizations.

Announcement

(Bang. Renal J. 2009; 28(1): 23-24)

Oxford-Ghent Dialysis and Transplantation Summer School 19-23 September 2009

Location: Corpus Christi College, Oxford

Organized by: Paul Harden, Oxford, Wim Van Biesen, Ghent, Raymond Vanholder, Ghent.

An INTERACTIVE course for young nephrologists (flu-ency in English is mandatory).

Education is provided m interactive tutorials m small groups of 10-12 participants.

All tutorials start from a clinical problem

The major aim of the course is to disperse available knowl-edge among young nepludogists (last year of training or just finished training)

Topics covered include: Predialysis strategies, Non-renal problems in dialysis patients, Haemodialysis strategies, Nntoneal dialysis strategics, Transplantation, Ethical and economical issues of dialysis.

A large faculty of opinion leaders with clinical experience in their field madeates the debate.

The course is hosted in the stimulating setting of Corpus Christi College in medieval Oxford. The atmosphere of this college and the city of Oxford provide an ideal climate for discussion and learning.

For organisational reasons, this year, the course will be restricted to applications from the follawmg countries: The Netherlands, Belgium, Luxemburg, Germany, Sweden, Norway, Denmark, Finland, Austria, Switzerland, United Kingdom and Ireland.

For application: Mail to Isabel.vandorpe@ugent be to obtain the official ap-plication form or contact your local Genzyme representative for more information.

The 9th European Peritoneal Dialysis Meeting 9th-12th October 2009

Palais des Congress Strasbourg

For more information, please go to: http://www. europd.comf

Apply for an ISN Educational Ambassador to Visit Your Center

ISN COMGAN and its Education Committee believe the most effective teaching takes place in face-to-face, hands on settings. ISN is now extending its traditional CME lecture program to offer renal centers in emerging coun-tries the opportunity to invite an established expert (ISN Educational Ambassador) from outside to come to your institution and remain for a period of 1-4 weeks to pro-vide hands on teaching and help to establish new programs that would benefit patient care. Experts may be selected directly by the center, or ISN will match the needs of the center with qualified experts who have volunteered to become educational ambassadors. Costs of travel will be covered by ISN, centers are asked to provide local accommodations.

Tired of reading journals, reviews and textbooks writ-ten by distant experts that cannot answer your questions or give advice? Invite the expert to come to you! This new program offers support for a unique opportunity to start new programs and expose your students, residents, fellows and practitioners to in depth contact with an estab-lished ISN teacher whose experience and expertise matches your needs.

More information and application forms are available at http:llwwwnature.cunlrisn/ society/outreachf2sn_20090. htrnl

Become an Educational Ambassador for ISN

The ISN seeks qualified nephrologists willing to visit a renal center in a developing country for as little as 1-2 weeks to help establish or upgrade a new clinical pro-gram (e.g. peritoneal dialysis, management of AKI, pedi-atric nephrology, renal pathology, many others). Expertise will be matched with needs outlined in applications for assistance from developing country centers. Timing is flex-ible and negotiable. Both all nephrologists with a hospital or university teaching position and an existing or potential interest in international renal health care are welcomed. Travel costs are paid by ISN, and local accommodations will be provided by host centers.

You can volunteer to visit a developing renal center that needs your help in a part of the world you would not

ordi-narily see, experience a unique professional opportunity for service and interaction with local providers, make a contri-bution to improving renal care in the emerging world and promote international understanding and collaboration. If you are someone who sees yourself as a concerned citizen of the global health community, this program is a way to demonstrate that commitment by sharing your expertise where it is most needed.

If you are an emerging center that would like m benefit from the visit of an Educational Ambassador ISN is now also welcoming application requests for training! Applica-tions must be received by May 1 st.

More information and application forms are available at http:lhvwwnahure.comfisolsacietyloutreachlisn 20090. html

8th Seminar In Nephrology In Wels, Austria 16 January 2010 from 09:30 am to 02:30 pm

Venue: Festsaal, Klinikum Kreuzschwestern Wels GmbH, Cttiealdrchnerstrasse 42, A-4600 Weis, Austria.

Topic: "Nephrotogy and Geriatrics".

The meeting is held in German language and will be pre-sented by speakers from all over Austria and with as special guests Prof. E. Ritz and Prof. C. Wanner, who will make it a stimulating conference. Extended abstracts of all lectures will be available shortly after the seminar at our website www.nephrovilava.net

For further information, please visit our website at www.nepbrovilava.net, or contact 17r. Friedrich Prischl, **Ktinitn**$_u$in Wels-Griesldruhen, Grieahirchnershasse 42, A-4600 Wets, Austria. Tel. +43 7242 415 2174, Fax +43 7242 415 3993, or email: frieckich.priwhl@klhdkum-wegrat

Renal Physiology for the Clinician

Fluids, electrolytes and acid-base

All you need to know about fluid and electrolyte balance, but were too puzzled to ask!

14-16 April 2010, The Royal Free Hampstead NHS Trust, Pond Street, London NW3

This course aims to integrate physiological principles with day-to-day clinical practice. It will feature formal, intro-ductory lectures each day, and clinical case-based and in-teractive discussions with our faculty designed to illustrate and build upon the day's presentations. It is intended for Specialist Registrars in Nephrology, and will also be of interest to more senior General (Internal) Medicine SPRs and SPRs in Intensive Care Medicine. Consultant Nephrol-ogists and General Physicians with an interest in fluid and electrolyte disorders are welcome to attend as a "refresher" course.

Closing Date for Registration 15 March 2010

For registration information, please contact the Course Administrator:

Pamela Fong Whitehead Tel +44 (0)20 7830 2930 Centre for Nephrology Fax +44 (0)20 7317 8591 UCL Medical School, Rowland Hill Street, London NW3 2PF UK.

Email: p£whitehead @nedsch.ucl.ac.uk

Course Directors: Dr Chris Laing and Professor Robert J. Unwin.