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Original Article

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Combined Clinical Consequences of an Individualized Dialysate Sodium Prescription and Dietary Sodium Restriction in Hemodialysis Patients

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Abstract

Background: The degree to which the dialysate prescription and, in particular, the dialysate sodium concentration influences blood pressure and interdialytic weight gain (IDWG) via changes in sodium flux, plasma volume or the other parameters is not well understood. The aim of the study was to investigate whether dialysis patients will have some beneficial effects of dialysate sodium set up lower than serum sodium. *Material and Methods:* Fifty patients (38 men and 12 women) underwent 20 consecutive hemodialysis (HD) sessions (8 weeks) with dialysate sodium concentration set up on 139 mmol/L (standard sodium – first phase), followed by 20 sessions (second phase) wherein dialysate sodium was set up according to individualized sodium. Variables of interest were: systolic, diastolic blood pressure, IDWG, thirst score – (Dialysis Thirst Inventory (DTI)) and complications (occurrence of hypotension and muscle cramps). *Results*: Sodium individualization resulted in significantly lower blood pressure (BP =-11.6/-3.5 mm Hg, $P < 0.001$ for systolic BP and BP = -2/-6.46 mm hg [$P = 0.194$] for diastolic BP) and IDWG (+, 2.8 ± 0.75 kg; individualized Na+ 2.2 ± 0.61 kg; $P < 0.001$). Thirst score was not significantly lower in patients with individualized-sodium than compared to standard Na group. There were no significant changes in terms of complications such as hypotension. *Conclusion*: Individualized sodium resulted in clinical benefits in normotensive and hypertensive patients.

Keywords: Interdialytic weight gain (IDWG); Hemodialysis (HD); Dialysis Thirst Inventory (DTI).

Aim of the Study

Primary: To study the effect of Individualized dialysate sodium on IDWG and blood pressure.

Secondary: To study the effect of Individualized dialysate sodium on hypotension and thrist score.

Method

Inclusion Criteria

All patients on HD for at least three months were enrolled from our dialysis unit .Patients who were receiving thrice weekly or twice weekly HD with volumetric dialysis machines (Fresenius, gambro) using bicarbonate-based dialysate and polysulfone dialyzer were selected. Patients were in stable clinical condition, stable prescribed dry weight, and residual daily urine output<500 ml/day.

Exclusion Criteria

Patients not willing to participate, severe ischemia cardiac disease with poor Left ventricular reserves were excluded.

Study Design

This was a prospective, nonrandomized, single-blind, crossover trial. The study was performed in two different phases, with each subject used as his/her own control. Dry weight, dialysis prescription, and medications were not modified during the entire study except for the dialysate sodium concentration.

In the first phase, patients underwent twenty consecutive HD sessions with a standard dialysis prescription of blood flow ≥ 300 mL/min and dialysate flow of 500 mL/min. The standard dialysate composition were as follows : bicarbonate 33 mEq/L, potassium 2.0 mEq/L, calcium 3.5 mEq/L, magnesium 1.0 mEq/L, chloride 109.5 mEq/L, and acetate 3.0 mEq/L. The dialysate sodium concentration was fixed at 139 mEq/L, which is the standard concentration used in our dialysis facility. The pre HD plasma sodium concentration was determined for each patient in three different dialysis sessions. Dialysate conductivity (13.7 ± 0.2 ms/cm) will be used as reference for dialysate sodium concentration.

In the second phase of the study, patients were again subjected to twenty consecutive HD sessions, but the dialysate Na+ concentration was set to the mean of the pre-HD Na+ concentration multiplied by the Donnan coefficient of 0.95 (individualized Na+). Sodium intake was assessed by our dietician by dietary recall method.

Clinical Parameters for the Study

Blood Pressure Measurement

Pre-, intra-, and post-HD BP will be measured using a mercury sphygmomanometer. Auscultatory measurements followed standard clinical guidelines using Korotkoff I and V sounds to indicate systolic and diastolic BP, respectively.

Dry Weight Assessment

Estimated dry weight was determined through standard clinical criteria. Ultrafiltration (UF) and IDWG will be determined based on changes in body weight before and after each HD session (UF), or between the end of HD and return to the next session (IDWG).

Dialysis-Related Hypotension and Symptoms

Dialysis-related hypotension and symptoms (headache, cramps, nausea, and vomiting) were recorded and analyzed as the number of occurrences during each study phase. Hypotensive episodes were defined as rapid changes in BP (within 15 minutes) accompanied by symptoms requiring nursing interventions, or a brisk fall in BP >40 mm Hg systolic or >20 mm Hg diastolic within a 15-minute period regardless of symptoms or interventions.

Interdialytic Thirst Scores

Interdialytic thirst scores (nil, mild, moderate, and severe) was obtained by a written questionnaire answered by the patients after each phase of the study.

Statistical Analysis

Descriptive and inferential statistical analysis was carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. The following assumptions on data is made, **Assumptions:** 1. Dependent variables should be normally distributed, 2. Samples drawn from the population should be random, Cases of the samples should be independent. Student t test (two tailed, dependent) has been used to find the significance of study parameters on continuous scale with in each group. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups, Non-parametric setting for Qualitative data analysis.

Results

Of a total of 50 patients , 38 (76%) were males and 12 (24%) were females(fig.2). The mean age was 51.14± 15.3 years **(Figure 1)** and subjects were on dialysis for a median time of 24 months (range 3 to 120months). Diabetic nephropathy and ischemic nephropathy was the presumed cause of the end-stage renal disease in 35 patients (70%), chronic glomerulonephritis in six (22%), tubulointerstitial disease in one (1%), and unknown in one patient (1%). Thirty-eight patients (75%) were receiving erythropoietin (5000 ± 3200 U/wk) with mean hematocrit of 31 ± 5%. The average duration of each HD session was 4.1 ± 0.3 hours. Forty-eight out of fifty patients had a mean predialysis plasma sodium concentration adjusted by the Gibbs-Donnan factor lower than the standard dialysate sodium concentration.

Predialysis plasma Na+ was similar in both periods of the study **(Figure 3)**. The coefficient of variation of pre-HD sodium concentration was 0.5% and 0.7% in the standard and individualized phases, respectively. There was a significant decrease in IDWG , UF **(Table 1 & 2)**.There were significant differences in pre- and post-HD blood pressure levels for the group taken as a whole (Table 3).Systolic BP during the individualized Na+ phase (BP= -11.6/-3.5 mm Hg, $P < 0.001$ for systolic BP and $P = 0.194$ for diastolic BP= -2.1/6.4 mm hg). Forty-eight patients (96%) were taking antihypertensive medications (mean 2.1 ± 0.6 drugs; range 1 to 4 drugs).

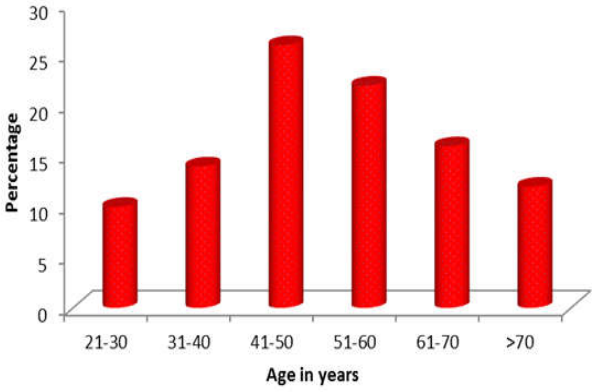

Fig. 1: Age distribution of the patients

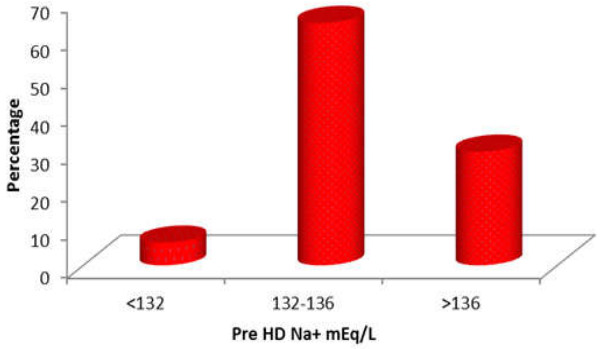

Fig. 2: Gender distribution of the patients

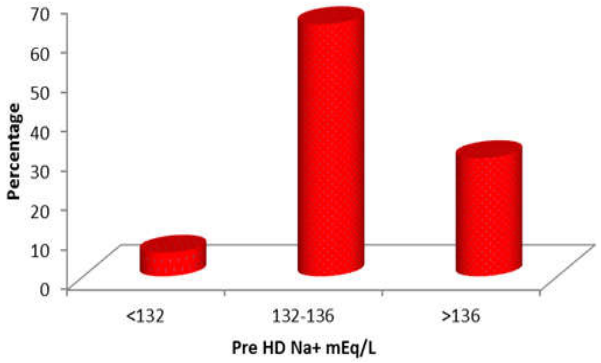

Fig. 3: Pre HD Na+ distribution in the patients

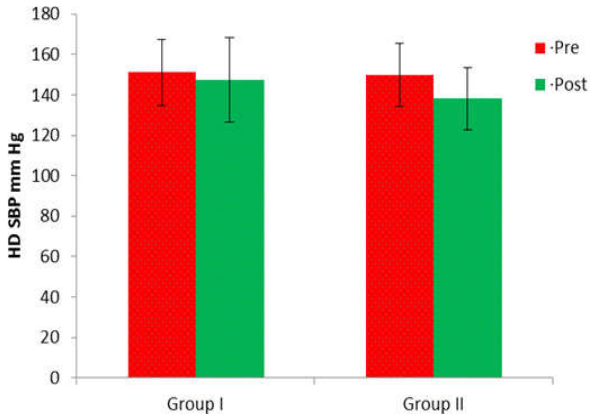

Fig. 4: Showing SBP and DBP distribution in the patients

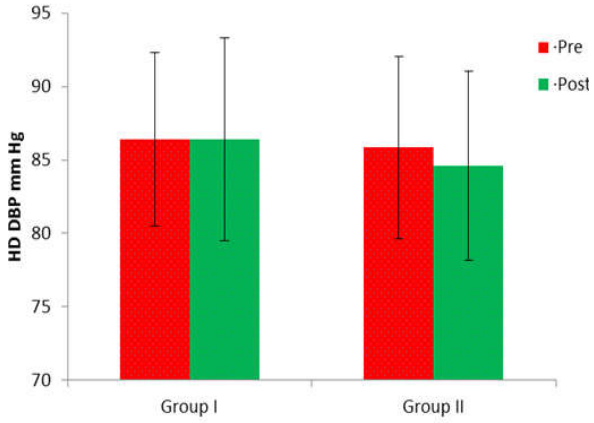

Fig. 5: Showing hypotension in both the groups.

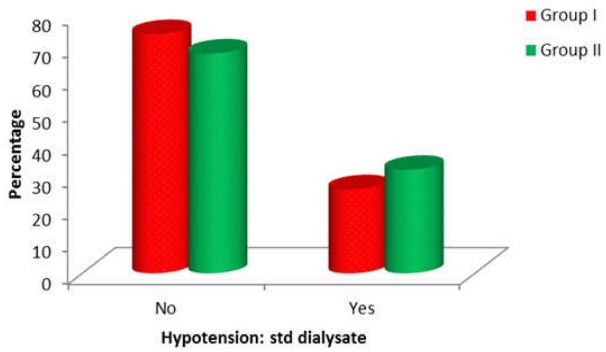

Fig. 6: Number of anti-hypertensive medications

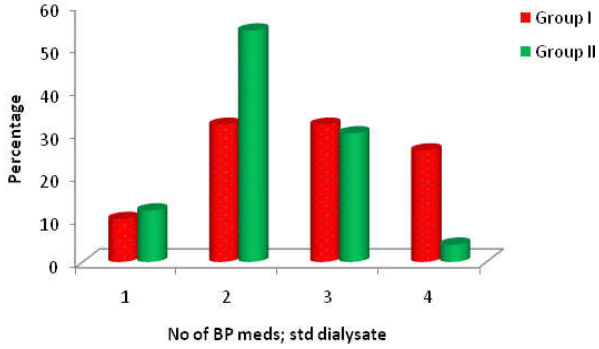

Fig. 7: Interdialytic thirst scores

No differences in achieved weight were noted between groups. Significant changes in IDWG occurred in patients with standard Na+, 2.8 ± 0.75 kg; individualized Na+ 2.2 ± 0.61 kg;($P < 0.001$). Dialysis-related hypotension and related symptoms were similar as in the individualized sodium phase of the study .Thirst scores were also similar in both the groups. Average salt consumption was 3-6 gm/ day in both groups. Even after dietary counseling , salt intake could not be reduced in the individualized Na+ phase. Number of anti-hypertensive medications were significantly reduced in the individualized Na+ phase .The maximum benefit was seen in those patients who were taking 3-4 anti-hypertensive medications which were reduced to 2-3 (P=0.012) .

Table 1: IDWG kg distribution of patients studied

IDWG kg	Group 1	%	Group 2	%
1-2	19	38	25	50
3-5	17	34	15	30
6-10	13	26	10	20
>10	1	2	0	0
Total	50	100	50	100

Table 2: Ultrafiltration of patients studied

Weight gain	Group 1	%	Group 2	%
<3	22	44	28	56
3-6	25	50	22	44
>6	3	6	0	0
Total	50	100	50	100

Table 3: Showing SBP and DBP distribution in the patients

Pre	Group I	Group II	Difference	P value
HD SBP mm Hg				
Pre	151.00±16.10	149.60±15.64	1.400	0.593
Post	147.40±20.68	138.00±15.25	9.400	0.001**
Difference	3.60	11.60	-	-
P value	0.226	<0.001**	-	-
HD DBP mm Hg				
Pre	86.40±5.92	85.84±6.21	0.560	0.654
Post	86.40±6.93	84.60±6.46	1.800	0.107
Difference	0.00	1.24	-	-
P value	1.000	0.194	-	-

P=0.509, Not significant, Chi-square test

Table 4: Hypotension: STD dialysate in group I and Group II

Hypotension: std dialysate	Group I		Group II	
	No	%	No	%
No	37	74.0	34	68.0
Yes	13	26.0	16	32.0
Total	50	100.0	50	100.0

P=0.012*, significant, Fisher Exact test

Table 5: Number of anti-hypertensive medications

No of BP meds; std Dialysate	Group I		Group II	
	No	%	No	%
1	5	10.0	6	12.0
2	16	32.0	27	54.0
3	16	32.0	15	30.0
4	13	26.0	2	4.0
Total	50	100.0	50	100.0

P=0.469, Not significant, Chi-square test

Table 6: Interdialytic thirst scores

Interdialytic thirst scores: STD dialysate	Group I		Group II	
	No	%	No	%
Nil	24	48.0	23	46.0
Mild	16	32.0	12	24.0
Moderate	10	20.0	15	30.0
Severe	0	0.0	0	0.0
Total	50	100.0	50	100.0

P=0.469, Not significant, Chi-square test

Discussion

In this study we analyzed the short-term outcome of an individualized dialysate Na+ prescription in a population of both diabetic and nondiabetic, stable HD patients. The short-term duration permitted us to leave unchanged important parameters, such as estimated dry weight, and thereby link the observed differences exclusively to the dialysate sodium changes. The main findings of our study were a reduction in IDWG, ultrafiltration, interdialytic thirst, and an improvement in predialysis BP and reduction in number of antihypertensive medications. The most prescribed antihypertensive drugs were: angiotensin receptor blockers , calcium channel blockers and β-blockers.

The Gibbs-Donnan effect in hemodialysis occurs because plasma proteins, which are negatively charged and not diffusible through the dialysis membrane, create an electric field that attracts sodium, reducing the plasma diffusible sodium by 4% to 5% [1]. As it imitates what happens in HD, we applied a theoretical Gibbs-Donnan effect of 0.95 to plasma Na+ concentration to better estimate the actual gradient between dialysate and plasma. Other methods may be used to establish the actual pre-HD dialysate to plasma sodium gradient. Dialysate conductivity reflects ionic activity and mirrors dialysate Na+ concentration when multiplied by 10 [2]. On-line dialysate and plasma conductivity can be measured inHD patients and reflects diffusible particles, mainly sodium. In machines equipped with conductivity monitors, this technique may be used to estimate the dialysate to pre- HD plasma sodium gradient, and has the advantage of allowing adjustments and matching during the dialysis session [3].

Our results showed that predialysis sodium concentration was constant when the dialysate was set to a standard concentration, and remained at the same level when the dialysate sodium concentration was individualized. This is in agreement with previous studies showing that the predialysis sodium concentration is constant independently of the sodium gradient established between blood and dialysate in the previous session [4]. This "set point" dictates the interdialytic fluid intake to bring one's osmolality back to its set point; if the post-HD Na+ is higher, greater IDWG will inevitably occur. Our data substantiate this assertion. Bylinear regression analyses, Keen and Gotch and Mendoza et all. showed a statistically significant association between the magnitude of the Na+ gradient and interdialytic weight gain and blood pressurein smaller samples of HD patients [5,6]. But, Heckinget all, reported that higher dialysate-Na prescriptions are associated with increased IDWG, but not with a higher risk for hospitalization or death. Instead, patients dialyzed with higher dialysate-Na concentrations had a significantly lower risk for hospitalization and, in facilities where all or almost all patients used the same dialysate-Na, a significantly lower risk for death [12]. Individualizing the dialysate-sodium is a simple complementary strategy to restrict sodium in HD that may help reduce IDWG in some patients [8,9].

We found a significant correlation of reducing the dialysate Na+ and IDWG in the indivialzed dialysate Na+ phase of the study. These data are in agreement with the findings of Levin et al [10], who found the same significant correlation between the dialysate to blood Na+ gradient and the absolute interdialytic weight gain.

Paula et. al [11] showed that a part of the interdialytic fluid ingestion is destined to supply the free water deficit generated by the higher dialysate sodium concentration. Our study also showed that there was significant reduction in interdialytic thirst scores, IDWG, and, concomitantly, in ultrafiltration requirements in individualized Na+ group . The decrease in the rate of fluid removal during the HD session is the most likely cause of the observed reduction in the HD hypotension episodes.

Individualization of dialysate-Na was very well tolerated by patients, probably as a result of the lower IDWG and lower UF rate, with almost few adverse events. But, on the other hand, aiming to reach eunatremia may increase the risk of intradialytic hypotension. Indeed, two studies reported a

reduction in the frequency of intradialytic hypotension after decreasing dialysate sodium [11,12]. Therefore, individualization of dialysate sodium mainly influences the IDWG and leads to better BP control in patients with poorly controlled BP and this group of patients is generally asymptomatic. On the other hand, this is not the case with hemodynamically stable patients or hypotensive-prone patients, where individualization of dialysate sodium has no influence on BP.

The main concern with the method of individualized dialysate Na+ prescription is that, in attempting to reach an isonatric HD, it could result in hyponatremia and hyposmolality-related complications because of the lack of sodium diffusion and the concomitant sodium losses by ultrafiltration. Indeed, postdialysis Na+ plasma concentration was significantly reduced in the individualized Na+ HD. However, convective sodium losses are lower than expected in HD, and were partially compensated by the reduction in the ultrafiltration and were well tolerated.

Besides, predialysis sodium remained unchanged despite the decrease in IDWG, probably related to a decrease in interdialytic fluid ingestion. Therefore, we hypothesize that the adjustment in the sodium prescription based on predialysis values may be used safely.

It could be anticipated that decreased IDWG and a more negative Na+ balance could lead to better BP control; however, it is well known that there is a lag period between changes in Na+ balance and volume status and achievement of BP control [13], we found that BP control improved after only 2-3 weeks of intervention. Several previous studies have addressed this issue in different ways [14, 15-17]. Flanigan et al and Song et al have demonstrated that the use of Na+ profiling with high time-averaged dialysate Na+ leads to higher BP carefully documented by ambulatory BP monitoring [15, 16]. Alternatively, Krautzig et al [14] and Ferraboli showed that lowering the dialysate sodium concentration to 135 mEq/L can be a successful intervention to improve BP control, a finding that was not corroborated by Kooman et al [17].

Analyses of BP data showed that, subjects had a significant overall improvement in BP control. Similar findings were reported by Flanigan et al in their study of different sodium modeling approaches, where hypertensive patients had a usual fall in BP, especially those who were not under pharmacologic treatment [15]. Presence or absence of drug treatment did not alter our results; only the presence of uncontrolled BP was a predictor of a BP-lowering response to individualized dialysate Na+ in our study

It does not seem that our results were caused by the observed changes in IDWG, as there were no significant changes in achieved weight, and hypertensive patients had a significant decrease in IDWG in the individualized Na+ HD. Individualized dialysate prescriptions lead to a decrease in ionic mass transfer to the patient [2], so it is possible that the individualized prescription led to a more favorable sodium balance and lower peripheral resistance, as has been suggested in patients undergoing daily nocturnal hemodialysis [18,19].

Our study has several limitations. 1) we did not use ambulatory BP monitoring, which is a more precise method to estimate BP in dialysis patients, as established by our own group [27]. While this is a limitation, the careful protocol observed in the determination of peridialysis BPs makes our results as reproducible as possible. 2) Free water deficit was not calculated. 3) Dialysate and post dialysis serum sodium was not evaluated.

Conflict of Interest: None

This study was conducted at ISNSC, Pondicherry 2017 for Tanker award presentation.

Conclusion

An individualized dialysate Na+ concentration was associated with a decrease in interdialytic thirst, IDWG, dialysis hypotension and related-symptoms, and better BP control in stable chronic HD patients. Long-term studies are necessary to observe if these short-term benefits are sustained.

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Original Article

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Role of PSA in Diagnosing Carcinoma Prostate in India: Is the Situation Same as in Developed Countries

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Abstract

Background: Prostate cancer has become the single most common non-cutaneous malignancy in men. Its incidence has been rising rapidly in most countries including low risk countries like India. Present study deals with the PSA value in patients with prostatic symptoms and its correlation with the prostatic biopsy specimen. *Purpose*: (i) Co-relation of raised PSA in non- carcinoma prostate patients. (ii) At what stage does carcinoma of prostate gets diagnosed in Indian scenario. (iii) What are the treatment options opted by the patients who are diagnosed with carcinoma of prostate for the first time. *Materials and Methods:* First 500 patients that presented with lower urinary tract symptoms and prostatic enlargement through the casualty department, outpatient department and in patient department of the Department of Urology, Ruby Hall Clinic, Pune from March 2012 to February 2014 were included in the present study.Prostatic biopsy was done in cases with either increased serum PSA level and/or palpable nodule and/or suspicious TRUS findings or a combination of two out of these 3 factors. *Results:* Mean PSA value is 8.5ng/ml in BPH patients, indicating higher values in Indian patients, due to prostatitis.Maximum carcinoma prostate patients presented late with metastases. As the limit of PSA value for diagnosis of carcinoma prostate increases from 4ng/ml to 15ng/ml the sensitivity decreases and the specificity and diagnostic accuracy increases.The patients of carcinoma prostate received treatment as per their stage of presentation. *Conclusion:* In Indian context there is an overall baseline elevation of lower minimum level of the normal PSA.This is probably due to association of prostatitis in Indian population.

Keywords: BPH; Carcinoma Prostate in India; Chronic Prostatitis; PSA.

Introduction

Globally, prostate cancer is the second most frequently diagnosed cancer in men (13.6% of the total) and the fifth most common cancer overall. Prostate cancer (PCa) has become the single most common non-cutaneous malignancy in men in the Western world since 1984, and its incidence has been rising rapidly in most countries including low risk countries like India [1].

Majority of the newly detected cases of carcinoma of prostate in developed countries are staged T1c.4. This is attributed to the presence of a comprehensive screening programme with the Prostate specific antigen (PSA) as its screening tool. But the detection of cancer at a stage (T3 and beyond) where a curative procedure is not possible is a major stumbling block in India.

The introduction of PSA in 1980 began a new era in early detection of carcinoma prostate. Prostate cancer one of the commonest malignancy in men in

developed countries which is known to have a long history before detection. Epidemiological studies have suggested that the period of 10-12 years may elapse between the origin of tumour and its detection with subsequent clinical manifestation or at autopsy.

PSA is organ specific but it is not cancer specific. This results in its inability to differentiate carcinoma of prostate from other benign conditions that lead to rise in PSA levels viz. BPH, infection, etc. Moreover, PSA is not increased in all patients with carcinoma prostate. Also, serum PSA levels are decreased in men with high body mass indices compared to normal weight men. Inspite of all this and false positive and false negative results, its organ specificity has revolutionised the treatment of carcinoma prostate. This has led to a shift in the tumour stage at diagnosis in patients with carcinoma prostate.

Currently the detection strategies for carcinoma prostate include the efficient use of the combination of digital rectal examination, serum PSA levels and the transrectal ultrasonography (TRUS) with systematic biopsy. The normal value for PSA is 0-4ng/ml. Thus, the current three pronged approached has led to increased rate of detection of carcinoma of prostate at an early stage.

Present study deals with the PSA value in patients with prostatic symptoms and its correlation with the prostatic biopsy specimen and the treatment strategies that are followed at that stage of tumour detection in Indian scenario.

Objectives

i. Co-relation of raised PSA in non- carcinoma prostate patients.
ii. At what stage does carcinoma of prostate gets diagnosed in Indian scenario.
iii. What are the treatment options opted by the patients who are diagnosed with carcinoma of prostate for the first time.

Materials and Methods

First 500 patients that presented with lower urinary tract symptoms and prostatic enlargement through the casualty department, outpatient department and in patient department of the Department of Urology at Ruby Hall Clinic Pune, from March 2012 to February 2014 were studied and included in the present study group. All these patients were worked up with detailed history and clinical examination to rule out other causes of LUTS and complications of BPH. PSA assay were done before DRE, catheterisation and TRUS to avoid false elevation in PSA levels. Prostatic biopsy was done in cases with either increased serum PSA level and/or palpable nodule or enlarged prostate on DRE and/or suspicious TRUS findings or a combination of two out of these 3 factors.

TRUS was done using real time ultrasound scanner equipped with 7.5MHz (end firing).

Volume of prostate was measured by Prolate ellipsoid formula (volume = 0.52 x L X W X H).

Inclusion Criteria

i. Patients with LUTS (related to prostatism, other causes ruled out by history and relevant investigation)
ii. Palpable nodule or suspected DRE
iii. Raised PSA
iv. Suspected findings on TRUS

Exclusion Criteria

i. H/O prostatic surgery.
ii. H/O urethral manipulation.
iii. Patients with indwelling catheter.
iv. Patients with signs and symptoms of acute prostatitis.

Patients were explained about prostatic biopsy procedure and following informed consent, patients were subjected for Trucut biopsy under local anesthesia under antibiotic cover.

Biopsy specimen were sent to the Department of Pathology, Ruby Hall Clinic, Pune for histopathological evaluation.

Statistical Analysis

Collected data was analyzed with descriptive statistics. Chi-square test and Pearson's Correlation coefficient was used to analyse the association and comparison. Tests were used to analyse the sensitivity, specificity and overall accuracy of PSA in diagnosing benign and malignant prostatic diseases.

Results

Out of the 500 patients included in the study, 125 patients underwent transrectal ultrasound guided

prostate biopsy. Of these, 74 patients were diagnosed with carcinoma of the prostate. They received treatment according to the stage of disease. Rest 51 patients (out of 125 patients) who had negative biopsy and 375 of other raised PSA patients (who did not have biopsy) had a repeat PSA testing after a course of antibiotics after 4 weeks. The PSA in these patients did not regress to normal at the end of 4 weeks. Repeat PSA third time was done after another 2 months only in 105 patients who came for follow up. All these 105 patients had normal PSA values (</= 4ng/ml) at the end of 3 months. Out of these 105 patients, 54 patients had relief of their symptoms after a repeat course of antibiotics. 51 patients were not relieved symptomatically and underwent transurethral resection of prostate. All of these patients on histopathology were found to have non-malignant etiology.

The mean age of the patients with carcinoma prostate was 69.3 years and the mean age of BPH patients was 56.95 years. BPH and Carcinoma prostate manifested clinically between the age group 40-90 years, in which the maximum patients of BPH and Carcinoma prostate presented in the age group 51-80 years (70.19% and 79.93% of BPH and Carcinoma prostate patients respectively). The values are statistically significant. Maximum number of BPH patients had PSA in the range of 2-10 ng/ml while Carcinoma prostate patients are maximum in the range of >40ng/ml. The mean PSA value in BPH patients is 8.5ng/ml and 42.8ng/ml in carcinoma patients. The study shows that there is statistically significant relation between the PSA and the age of the patients i.e. as the age increase the PSA value also increases. In this study, the maximum number of BPH patients had prostate volume upto 40 cc followed by the volume of 40-50 cc. In the Carcinoma prostate group maximum patients had volume of 40-50 cc followed by upto 40 cc group. Table 1shows that in the present study maximum carcinoma prostate patients presented late with metastases, followed by the organ confined disease. The patients of carcinoma prostate received treatment as per their stage of presentation **(Table 2)**. **Table 3, 4 and 5** show that as the limit of PSA value for diagnosis of carcinoma prostate increases from 4ng/ml to 15ng/ml the sensitivity decreases and the specificity and diagnostic accuracy increases. This is statistically significant.

Table 1: Stage of diagnosis of CaP

Stage	No. of Patients	Percentage
Tis N0 M0	1	1.35
T2 N0 M0	19	25.68
T2 N2 M0	2	2.7
T3 N0 M0	9	12.16
T3 N1 M0	2	2.7
Metastatic (Any T, Any N, M1)	41	55.41
Total	74	100

Table 2: Treatment opted by patients of CaP

Treatment opted	No. of Patients	Percentage
Hormonal alone	34	45.95
Radical prostatectomy	16	21.62
Radical radiotherapy + Hormonal	6	8.11
Orchitectomy	6	8.11
Radical radiotherapy	4	5.41
Orchitectomy + Hormonal	2	2.7
Orchitectomy + Channel TURP	2	2.7
Radical radiotherapy + Ochitectomy	1	1.35
Hormonal + Channel TURP	1	1.35
Watchful waiting	1	1.35
Orchitectomy + Abiraterone+ Hormonal	1	1.35
Total	**74**	**100**

Table 3: Sensitivity and specificity of serum PSA(at 4ng/ml)

PSA	No. of patients aged over 45 years	
	CAP	BPH
Test positive (>4ng/ml)	71	374
Test negative (<4ng/ml)	1	0

Chi-square = 5.20, P<0.05, Sensitivity = 98.61%, Specificity = 0%, PPV = 15.96%, NPV = 0%, Accuracy = 15.92%, % of False positive = 100%, % of False negative = 1.39%

Table 4: Sensitivity and specificity of serum PSA(at 10ng/ml)

PSA	No. of patients aged over 45 years	
	CAP	BPH
Test positive (>10ng/ml)	63	141
Test negative (<10ng/ml)	9	233

Chi-square = 60.33, P<0.0001
Sensitivity = 87.50%, Specificity = 62.30%, PPV = 30.88%, NPV = 96.28%
Accuracy = 66.37%, % of False positive = 37.70%, % of False negative = 12.50%

Table 5: Sensitivity and specificity of serum PSA(at 15ng/ml)

PSA	No. of patients aged over 45 years	
	CAP	BPH
Test positive (>15ng/ml)	54	69
Test negative (<15ng/ml)	18	305

Chi-square = 96.67, P<0.0001
Sensitivity = 75%, Specificity = 81.55%, PPV = 43.90%, NPV = 94.43%
Accuracy = 80.49%, % of False positive = 18.45%, % of False negative = 25%

Discussion

Prostate specific antigen (PSA) has revolutionized the approach to men with prostatic disease and is the single best marker for prostatic malignancy today. Further the discovery that PSA exists in the serum in several different molecular forms and that the concentration and ratio of these forms vary according to the state of disease of the prostate gland, represents a substantial advancement in prostate cancer screening and management.

The incidence of prostate cancer is lowest in Asian countries [2,3]. In India prostate cancer does not qualify to be categorized to be a major health problem. In India, prostate cancer is identified as the only 10th common malignancy affecting men [4].

The mean age of diagnosis of carcinoma prostate in this study was 69.3 years. The largest percentage of cancer patients were found in the 65-74 years age group. BPH was found to be clustered over a much wider age range of 51-80 years where over 59.80% of the BPH cases were present in this age group. There is no study in literature which has indicated the age clustering due to the large scale prevalence of this condition. It is noteworthy that relatively greater proportion of cases in this group are asymptomatic.

The internationally accepted level of normal PSA range is 0-4.0ng/ml. This value has been determined on the basis of various western population based studies, which have studied PSA level in conjunction with other diagnostic techniques, primarily digital rectal examination (DRE) and transrectal ultrasound (TRUS). Catalona et al, in a prospective multicentric trial, found a positive predictive value (PPV) of 34% for PSA level greater than 4.0ng/ml as compared to 21.4% for an abnormal DRE in detecting prostate cancer [5]. Cooner et al demonstrated a PPV of 35.4% for a PSA cut off of 4.0ng/ml with a sensitivity of 58.7% and specificity of 60.7% in men undergoing biopsy for suspected prostate on ultrasound [6]. In our study only one patient had a PSA level between 2-4ng/ml, and was diagnosed carcinoma prostate. 258 patients in this study had a PSA level between 2-10 ng/ml and this was the gray area where greater number of prostate cancer and BPH cases were interspersed. The PPV in our study is 15.96% at PSA cut off of 4ng/ml.

In the present study the mean PSA in the carcinoma patients was higher being 126ng/ml. This was due to a large number of patients being diagnosed at an advanced stage. The mean PSA in the BPH patients was 11.44ng/ml. The lowest PSA in present study group is 2.04 ng/ml. Various population based studies have quoted different minimum levels for normal range of PSA [7,8,9,10]. In the present study one case was found to have cancer at 2.04ng/ml, it is therefore observed that the lower minimum level of normal PSA in Indian context is probably higher than the screening population of western countries. Therefore it can be inferred that in Indian context there is an overall baseline elevation of lower minimum level of the normal PSA. However this awaits further evaluation and confirmation by future population based studies.

It has been stated that cancer secretes 12 times more serum PSA per volume than BPH [11]. Therefore the volume of prostate with carcinoma prostate is presumed to be smaller than those with BPH. In our study the average size of prostate in BPH patients is 46.9cc and 49.2cc in carcinoma patients.

A serum PSA threshold of 4ng/ml is usually an indication for prostate biopsy, and PSA levels between 4-10ng/ml, which is considered a grey zone,

are shown to have a low sensitivity, but values above 10ng/ml have a high sensitivity for prostate cancer. The sensitivity reaches even 100% if we consider values higher than 15ng/ml [12]. In the present study 51.60% of the patients had PSA value in the range of 2-10ng/ml, out of which 49.6% were diagnosed with BPH with prostatitis and only 2% were diagnosed with carcinoma prostate. In the range of 10-20ng/ml, 28.2% of patients were present. Out of these, only 2.4% of the patients were diagnosed with carcinoma prostate. Maximum 8.8% of the patients had PSA value >40ng/ml and only 1.20% of patients of BPH had PSA in >40 range and rest 7.60% were carcinoma prostate patients. This is because in the present study out of 14.80% (74/500) of total cancer patients, 7.6% of the patients had PSA in the > 40ng/ml range.

In our study a lower cut off point of 4ng/ml had a sensitivity of 98.61% and specificity of 0%. At PSA level of >10ng/ml the sensitivity decreases to 87.5% and the specificity increases to 62.30%.

There are a few studies [3] in Asian population which showed that the PSA levels were higher due to the presence of prostatitis in these subjects. This was verified in our study as many of the patients with BPH had higher PSA. In the present study 28.2% of patients had PSA in the range of 10-20ng/ml, 7.20% had PSA in the range of 20-30ng/ml, 4.20% in the range of 30-40ng/ml and 8.80% patients had PSA >40ng/ml.

The application of PSA for staging prostate cancer has been the focus of numerous investigations. The use of PSA alone as a tumour marker is not sufficiently sensitive or specific for staging [13]. Although PSA directly correlates with clinical and pathological tumour stage, studies have revealed that this marker cannot accurately predict the final pathological stage for the individual patients [14,15]. In our study, most of the carcinoma prostate patients were diagnosed in the organ confined (27.03%, n=74) or metastasis (55.41%, n=74) stage. This is because our hospital is a tertiary center and large number of patients are referred with diagnosed carcinoma prostate.

In our study, higher PSA values (7.60% cases) before treatment are associated with higher pathological stage of disease at the time of diagnosis. This was correlated with the study by Doughlas et al in which they concluded that higher PSA and free PSA levels are likely to be associated with more locally advanced disease and total PSA was the best marker [16].

The patients of carcinoma prostate received treatment as per their stage of presentation **(Table 2)**. All the available options for treatment were utilized. Organ confined disease was approached with radical treatment and metastatic disease with medical or surgical castration. More patients opted for surgical castration because of financial constraints.

Prostate volume also influence PSA independently. In our study there was overall positive correlation between PSA and prostate volume. But in carcinoma prostate patients it is not significant. Agrawal MS et al in their study on cancer prostate patients also found no correlation between PSA and the prostate volume in their study [17].

Histopathologically, out of 125 patients who underwent biopsy 74 (59.20%) were diagnosed with carcinoma prostate and 51(40.80%) were diagnosed with BPH. Additionally prostatitis was diagnosed in 68.63% of the BPH patients. Morote R.J. also found cancer in 42.6%, BPH in 67.4% and chronic prostatitis in 47.3% of the biopsies done on the basis of abnormal DRE and PSA levels [18].

Conclusion

i. Serum PSA is useful in the routine evaluation of patients with lower urinary tract symptoms for diagnosis of prostatic diseases viz. BPH, prostatitis and carcinoma of prostate .

ii. As the PSA value increases the chances of malignancy increases. But in the present study, in the Indian context as most of the patients has prostatitis, consideration must be given for diagnosis of BPH with associated chronic prostatitis as raised PSA values are not always associated with carcinoma prostate.

iii. The prostate volume correlates well with PSA levels, as prostate volume increases PSA value also increases. But in case of carcinoma prostate PSA and prostate volume showed no statistical correlation.

iv. In this study most of the patients diagnosed with carcinoma prostate are in the advanced stage.

v. Increased PSA in non-carcinoma patients is well correlated with the presence of prostatitis.

vi. As most of the patients were diagnosed in advanced stage, the treatment opted by the patients was medical/surgical castration. Those diagnosed with organ confined disease opted for radical surgery.

vii. It can be inferred that in Indian context there is an overall baseline elevation of lower minimum level of the normal PSA. However this awaits

further evaluation and confirmation by future population based studies.

At the last this study provides information regarding increased PSA values and association of prostatitis in cases of raised PSA values in Indian population. So, we can hope that further research and population based studies in Indian population will add to the final words about increased PSA values.

Limitations

This is a single institute non-randomised clinical study to evaluate the results. The availability of necessary equipments and expertise made the study feasible. However, comparative studies and randomised trials would be of worth before making recommendations. A longer follow up and more number of patients from all over the country are needed.

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Conversion of Temporary (Uncuffed) Hemodialysis Catheters to Permanent (Cuffed) Hemodialysis Catheters

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Abstract

Background: To estimate the feasibility and clinical outcomes of conversion of temporary to permanent hemodialysis catheters using the same venous insertion site. *Methods*: The data of patients who underwent conversion of central venous catheter (CVC) from temporary to permanent type from November 2104 to December 2016 at EMS memorial co-operative hospital & research center, Perinthalmanna, Kerala, was analyzed. The conversion of catheter was performed at the existing venous access site under local anesthesia in operation theater with the guidance of C-ARM. Technical success, procedural complications, hemodialysis records and clinical outcomes were evaluated. *Results*: The study group consisted of 26 patients (14 males and 12 females)with age of 56.61 ±10.13 years. All 26 temporary catheters were successfully converted to permanent or tunneled hemodialysis catheters with 3 patients having minor oozing and no major procedure-related complications. The duration on temporary catheters ranged from 3-296 (mean: 53.42) days prior to their conversion to permanent type, after failure of multiple attempts at arterio-venous (AV) fistula creation. Heparin (5000 U/ml) along with Cefazoin (10 mg/ml) in ratio of 1:1 were used as locking solution and Mupirocin ointment was applied at exit site for both temporary & permanent catheters(PC) after each dialysis to reduce the incidence of catheter related blood stream infections (CRBSI). The total number of follow-up days with permanent catheter (PC) was 6730 (range:33-768, mean: 258.85, SD: 199.47). There were 8 events of culture proven sepsis, yielding a catheter infection rate of 1.2/1000 catheter days, one among them required PC removal due to unresponsive septicemia (0.14/1000 catheter days).None of them had exit site infection, tunnel infection requiring catheter removal. The patency rate was 96.15% at 30 days after insertion, with 9 catheters functioning at the end of the study period. One patient needed repostioning of PC due to poor blood flow within one week after insertion. Thirteen patients died with working catheters of causes unrelated to catheter. The catheters removed in 4 patients when they were no longer needed (access changed to AV graft in 2, AV fistula in 1, and 1 patient had improvement in renal parameters). Two patients required replacement with new PC (PC related septicemia in one and due inadvertent removal in another). *Conclusions*: Thus conversion of a temporary HD catheter to a tunneled catheter using the same venous insertion site is safe, does not increase the risk of infection, and allows conservation of other central venous access sites. The conversion also avoids complications associated with venotomy and allows conservation of other central venous access sites. Use of Heparin (5000 U/ml) along with Cefazoin (10 mg/ml) in ratio of 1:1; as locking solution and Mupirocin ointment for application at exit site for both TC & PC is an effective strategy to reduce the incidence of catheter related infections.

Keywords: Hemodialysis; Temporary Catheter; Permanent or Cuffed Catheter.

Introduction

Hemodialysis (HD) or peritoneal dialysis (PD) is a life-saving and life-sustaining procedure in those with end stage renal disease (ESRD), who are unable to undergo renal transplantation. The need for vascular access is an ever increasing challenge to the care providers. The majority of patients begin hemodialysis treatment with a central venous catheter (CVC) as their initial vascular access in India and elsewhere in the world [1-4]. The majority of patients who begin hemodialysis treatment using a temporary CVC (TC) in India will undergo creation of an arteriovenous (AV) fistula or AV graft as their permanent vascular access [3,4]. The tunneled or cuffed or permanent catheter (PC) is one of the vascular access options in patients with either poor vasculature leading to multiple failed attempts at AV fistula creation or those expected shorter life span or elderly age [5,6]. A study from Iran showed an increasing trend towards use of permanent catheters for hemodialysis [7]. The cuffed or permanent catheter (PC) may be inserted de-novo or may be converted later over guide-wire using peel away sheath with same venotomy site [5-11]. There is limited published data regarding the use of PC as permanent access for HD from India [8]. This study was done to estimate the feasibility and clinical outcomes of conversion of temporary to permanent hemodialysis catheters using the same venous insertion site.

Materaial and Methods

This is a retrospective study involving data of patients who underwent conversion of CVC from temporary to permanent type from November 2104 to December 2016 at EMS memorial co-operative hospital & research center, Perinthalmanna, Kerala. The patients were started on HD initially after insertion of TC (14F x 15cm, polyurethane, pre-curved or Raulerson internal jugular double lumen catheter by Medcomp®, Harleysville, PA,USA) in right internal jugular vein (IJV) as they were unfit or unwilling for PC insertion or if lacking mature AV fistula. The The conversion of temporary to permanent catheter (14.5 F x 36 cm, hemo-flow ®, polyurethane, by Medcomp®, Harleysville, PA,USA) was performed at the existing venous access site under local anesthesia in operation theater with the guidance of C-ARM, if attempts to create AV fistula failed due to poor vasculature. Technical success, procedural complications, hemodialysis records and clinical outcomes were evaluated. Statistical analysis was done using SPSS 17 for Windows, by SPSS Inc. IL, USA. The quantitative variables (age) have been described as mean ± SD and range. Theconfidence interval was 95%, and a two tailed $P < 0.05$ was used for statistical significance.

Techniques of Catheter Conversion

All procedures were performed by a Nephrologist and an assistant to Nephrology in operation theater and under sterile conditions, with assistance of C-ARM under local anesthesia. An cutaneous incision measuring 4-5 cm, was made at site of TC to expose the subcutaneous plane. A subcutaneous tunnel was created with one end below the clavicle and other-end exiting at the site of TC insertion. The PC passed through the tunnel using the tunneler provided with the catheter kit with Dacron cuff about 2 cm from the exit site and its position is secured. The guidewire is advanced through venous lumen of existing TC and TC was removed after confirming the position of guidewire in right atrium. The next step consisted of placing a peel-away sheath/dilator combination over the guidewire. The dilator and guidewire were removed and the catheter was inserted centrally through the sheath, which was peeled away. The PC was positioned so that its tip is in right atrium under guidance of C-ARM. All patients were given Amoxicillin-clavulanate 625 mg twice daily for 3 days after the procedure. The patient was monitored in ICU for 12 hrs after the procedure.

Results

The age, duration on temporary and permanent catheter and its relation with gender are presented in **Table 1** and comorbidities are shown in **Table 2**.

The study group consisted of 26 patients (12 females and 14 males)with age of 56.61 ±10.13 (range 40-79) years. All 26 TC were successfully converted to permanent or tunneled hemodialysis catheters with 3 patients having minor oozing and nomajor procedure-related complications. The duration on temporary catheters ranged from 3-296 (mean: 53.42) days prior to their conversion to permanent type, after failure of multiple attempts at arterio-venous (AV) fistula creation.

The diabetes mellitus was the commonest cause of ESRD in the study with majority of the patients having macrovascular complications involving coronary, cranial and peripheral arteries. The total number of follow-up days with permanent catheter

(PC) was 6730 (range: 33-768, mean: 258.85, SD: 199.47). Heparin (5000 U/ml) along with Cefazoin (10 mg/ml) in ratio of 1:1 were used as locking solution for both temporary & permanent catheters (PC) after each dialysis to reduce the incidence of catheter related blood stream infections (CRBSI). The Mupirocin ointment was applied at catheter insertion site of temporary CVC or exit site of PC for prevention of exit site infection.

There were 8 events of culture proven sepsis, yielding a catheter infection rate of 1.2/1000 catheter days, one among them required PC removal due to unresponsive septicemia (0.14/1000 catheter days).None of them had exit site infection, tunnel infection requiring catheter removal.Two patients required replacement with new PC (PC related septicemia in one and due inadvertent removal in another). The patency rate was 96.15 % at 30 days after insertion, with one patient requiring re-positioning within one week of procedure due to poor blood flow. Thirteen patients died with working catheters of causes unrelated to catheter, and it was major cause of dropout in the study followed by catheter removal. The catheters removed in 4 patients when they were no longer needed (access changed to AV graft in 2, AV fistula in 1, and 1 patient had improvement in renal parameters). Nine patients were undergoing HD functioning catheters at the end of the study period. The Kaplan-Meier survival graph of permanent catheter is shown in **Figure 1**.

Table 1: The age, duration on temporary and permanent catheter and its relation with gender

	Age (years)	Duration of Temporary catheter (days) Mean±Std. Deviation (range)	durationof permanent catheter (days)
Females	52.33±8.46 (40-67)	48.08±83.24 (3-296)	247.42±150.45 (102-736)
Males	60.29±10.28 (45-79)	58.00±56.79 (6-172)	268.64±239.03 (33-768)
Combined	56.62±10.13 (40-79)	53.42±68.93 (3-296)	258.85±199.46 (33-768)
p-value	0.23	0.59	0.35

Table 2: The comorbidities in patients undergoing permanent catheter insertion

Co-morbidity	Females (n-12)	Males (n-14)
Diabetes mellitus	10	13
Hypertension	12	14
Coronary artery disease	4	9
Cerebrovascular disease	4	0
Peripheral vascular disease	5	6

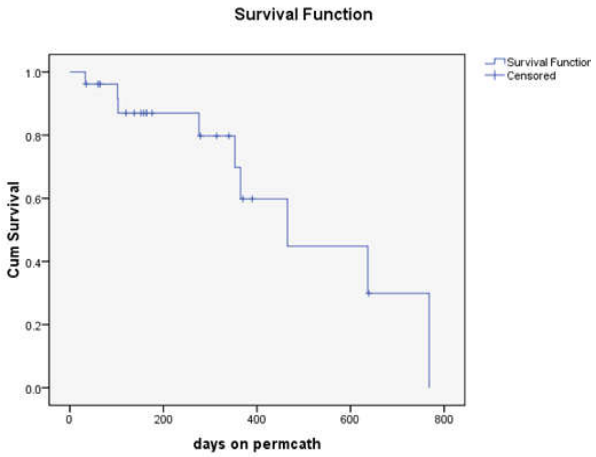

Fig. 1: The Kaplan-Meier survival graph of permanent catheter

Discussion

Successful dialysis is mandatory for patients with ESRD, and the lack of it due to improper vascular access is life threatening. Permanent catheters may serve as a critical permanent access when all other options have been exhausted. This retrospective study, included the patients who underwent conversion of temporary to permanent catheter over guide-wire and peel away sheath. This technique achieved 100 % technical success; in addition using same venotomy site with least complication rates, and also sparing other central venous sites for future use; similar to previous reports [8-12]. The age group of patients and male predominance was similar to other studies [8-12].

In this study, the right internal jugular vein was the initial access site in all the patients which was later converted to PC. The right IJV is also the preferred site for CVC insertion in other studies [8-12]. The duration on temporary catheters ranged from 3-296 (mean: 53.42) days prior to their conversion to permanent type; one of the highest reported till date. The median duration of TC in one of the published studies was 4 and 14 days in two study cohorts, respectively [12].

One the major concerns of the study was infections due longer duration of TC prior to its conversion to

PC. However, there were no documented cases of early CRBSI (< 30 days after procedure) probably due to use of Heparin (5000 U/ml) along with Cefazoin (10 mg/ml) in ratio of 1:1; as locking solution and Mupirocin ointment for application at exit site for both TC & PC. About 1.4% of the patients had early CRBSI needing catheter removal in an earlier study [12]. Falk et al, have reported even higher 30-day infection incidence (9.4%) and rate (3/1,000 catheter-days) [10].

Eight events of late CRBSI (onset >30 days after procedure) was observed in the study amounting to frequency of 1.2/1000 catheter days with one patient (3.84 %) requiring PC removal. Other studies have reported similar infection rates (per 1000 catheter days), ranging from 0.4 to 5.5 after denovo PC insertion and 0.8-3.0 after TC to PC conversion [5-12]. Therefore, overall infection risk after TC to PC conversion in the present study similar to that of denovo catheter placement.

The efficacy of prophylactic antibiotic administration to prevent infections in PC procedures is still controversial. The Cefazolin significantly reduced catheter-related infections, bacteremia, and catheter loss over placebo in one study [13] and there was no advantage of cefazolin over vancomycin in another study [12].

The PC related sepsis, change of access to AV fistula or AV graft, improvement in renal function were the indications for PC removal in the study similar to previous reports [8-13]. The 50 % patients died with working catheters of causes unrelated to catheter, and it was major cause of dropout in the study followed by catheter removal and 34.61 % were continuing HD through the PC.

Conclusions

Thus conversion of a temporary HD catheter to a tunneled catheter using the same venous insertion site is safe, does not increase the risk of infection, and allows conservation of other central venous access sites. The conversion also avoids complications associated with venotomy and allows conservation of other central venous access sites.

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Case Report

Urology, Nephrology and Andrology International
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Laparoscopic Pyelolithotomy in a Patient with Ectopic Kidney and Extrarenal Calyces

Rajendra Nerli*, Prasad V. Magadum*, Amey Pathade*, Shivagouda M. Patil*, Amit Mungarwadi*, Shridhar Ghagane, Murigendra B. Hiremath****

Abstract

The abnormalities of the renal collecting system represent a complex subset of urogenital anomalies. They could manifest in many ways and often are not diagnosed by preoperative imaging or the anomaly could be missed. Extrarenal calyces is one such rare anomaly of the collecting system. This anomaly may be associated with other anomalies of the urogenital system such as hydronephrosis, ectopic kidney or horseshoe kidney and could lead to complications such as stasis, infection and stones. We report a case of ectopic kidney with extra-renal calyces complicated with stones and infection.

Keywords: Extrarenal Calyces; Ectopic Kidney; Urolithiasis.

Introduction

Extrarenal calyces and infundibulum are uncommon congenital anomaly in which the major calyces/infundibulum as well as renal pelvis lie outside the renal parenchyma. This entity is commonly seen to co-exist with ectopic and horseshoe kidneys. The ureteral atresia and renal dysplasia are the other associations with this anomaly [1, 2]. The exact aetiology of extrarenal calyces is not very clearly understood. It has been hypothesized that the anomaly could be due to a disparity resulting from slow development of the metanephric tissue or to a relatively rapid development of ureteric bud. If the ureteric bud has a rapid or a precocious development, the calyceal system could well develop prior to its coalescence with the nephrogenic mass. Conversely, lag in the growth of nephrogenic mass could delay its attachment to the collecting system permiting extrarenal development of the first or second order of the collecting system [2,3,4]. These extra-renal calyces/infundibulum usually do not produce symptoms although failure of normal drainage can lead to stasis, infection and calculi formation. We report a case of right pelvic kidney with extra-renal calyces and urolithiasis which was managed by laparoscopic pyelo-lithotomy.

Case Report

A 22 year old male presented with pain in lower abdomen and fever. Ultrasonography and CT revealed a normal left kidney and an ectopic right kidney in the pelvis. The pelvicalyceal system on the right side was dilated and the contents were turbid. Two calculi measuring 1.5×1.0 cm and 1.41.0 cm were seen floating freely in the collecting system (**Figure 1a & 1b**). Serum creatinine was 1.65 mg%. The patient was treated with antibiotics and antipyretics. Once the fever subsided, DTPA

radioisotope renal scan was done to rule out obstruction of the right kidney **(Figure 2)**. Split renal function revealed left kidney 61% and right kidney 39%. The scan showed both the systems draining well with no evidence of obstruction.

The patient was taken up for laparoscopic pyelolithotomy under general anesthesia. A 10 mm endoscope was introduced through the umbilical port and two 5 mm working ports were placed 5 cm inferior and lateral to the umbilical port. The renal bulge was well made out on entering the peritoneal cavity. The peritoneum over the right kidney was incised and the kidney was dissected all around using bipolar cautery. The renal pelvis was dissected out **(Figure 3)**. The extrarenal calyces were mistaken as ureter, however the anatomy became clearer when the pelvis was dissected all around. The anatomy was confirmed. An incision was made on the most prominent part of the pelvis, stones were seen and extracted **(Figure 4)**. A double J stent was inserted and the pyelotomy incision closed. The patient had an uneventful recovery.

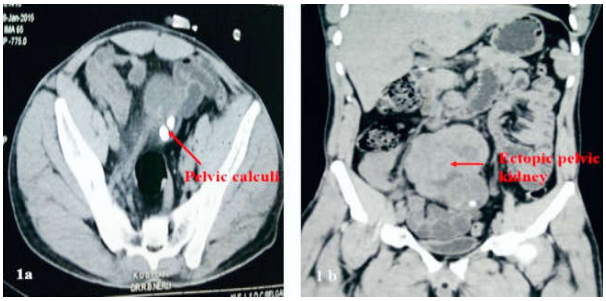

Fig. 1a and 1b: CT image showing ectopic pelvic kidney with pelvic calculi

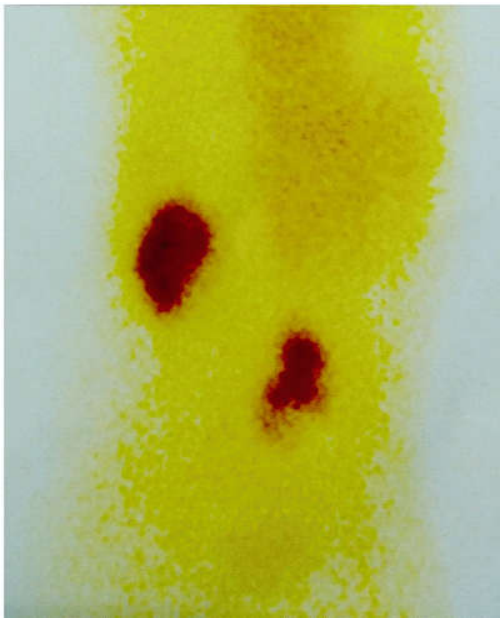

Fig. 2: DTPA Renogram showing ectopic pelvic kidney with adequate tracer uptake

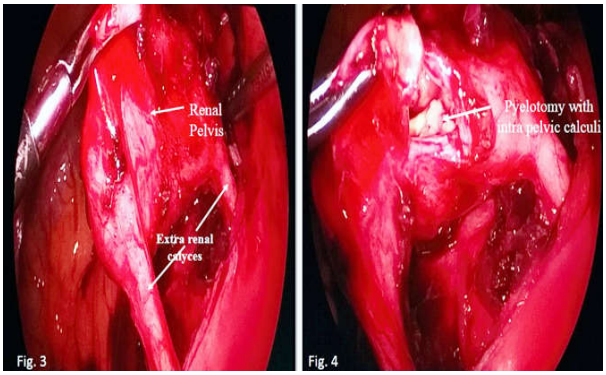

Figure 3 and 4: Laparoscopic image of right ectopic kidney with ectopic pelvis and ectopic calyces.Pyelotomy with intrapelvic calculi

Discussion

The urogenital system for some reason is more likely than any other to have congenital defects. The abnormalities of the collecting system which drains the urine from the kidney represent a complex and often confusing subset of urological anomalies. Extrarenal calyces, which are characterized by calyces and renal pelvis that lie outside the renal parenchyma, is one of the rare anomalies of the collecting system. The rarity of this anomaly and the complexity of possible associated anomalies often make the preoperative diagnosis difficult [1]. This anomaly was first reported by Eisendrath DN in 1925 [5], and since then another twenty or more cases have been reported [1].

The presentation of these anomalies is variable. It might be an incidental finding diagnosed at autopsy or may present with complications, such as stasis, infection, haematuria and pain. Hydronephrosis secondary to ureteropelvic junction obstruction (UPJO) has been reported in a few cases [1,6]. Our case presented with urinary tract infection secondary to renal pelvic calculi.

Though the renal pelvis was dilated, there was no obstruction either at UPJO or lower down as demonstrated on DTPA scan. Pre-operative imaging including CT (Computerized Tomography) did not give us the right picture. The anatomy became clearer only at the time of surgery.

Our case demonstrates that, one should be aware of such anomalies, so as to avoid intra-operative surprises and accidents. It is very important to delineate and define the structures during laparoscopy or minimal invasive surgery. Inadvertent ligation or incision of these calyces may lead to serious complications.

Conclusion

Ectopic kidney with extrarenal calyces is rare. Laparoscopic pyelolithotomy is a viable option for stone retrieval in ectopic pelvic kidneys. Laparoscopy also has an advantage of reduced morbidity.

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A Case Report of Appendicovesical Fistula

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Abstract

Appendicovesical fistulae are rare and occur secondary to acute or missed acute appendicitis. A 52 years old lady presented with isolated faecaluria, gross fecal contaminated wine or fresh contaminated urine. The presentation and management of appendicovesical fistula is discussed.

Keywords: Appendix; Urinary bladder; Fistula.

Case Discussion

52 years old lady presented with isolated faecaluria, gross fecal contaminated wine or fresh contaminated urine, it was the present disease symptoms she was not catheterized with no precious episodes of acute appendix, she did not have fever with chills and rigors. She has only dysuria; examination of the patient was not contributory. There was no ascitis, no mass, and no tender point. Pelvic examination: vagina free, cx mobile, no mass, no tenderness on mobility of cx Urine analysis: show Gross fecal matter with pyuria. USG: revealed No gas in the bladder but mixed echogenicity is

CECT:I) An enhanced small mass with gas and hyper dense lesion in the bladder. 2) Rest of the abdomen was reported normal Cystoscope: reeve an opening in the dome of the bladder. Exploratory laporotomy revealed omental adhesion wrapping appendix entering into the bladder. The base of the appendix, Caecurn, Ileum was normal. There was no significant mesenteric nodes, no diverticulitis coli. There was no other mass in siginoid and any part of colon. Enblock resection with the wedge of bladder and complete appendix resented.

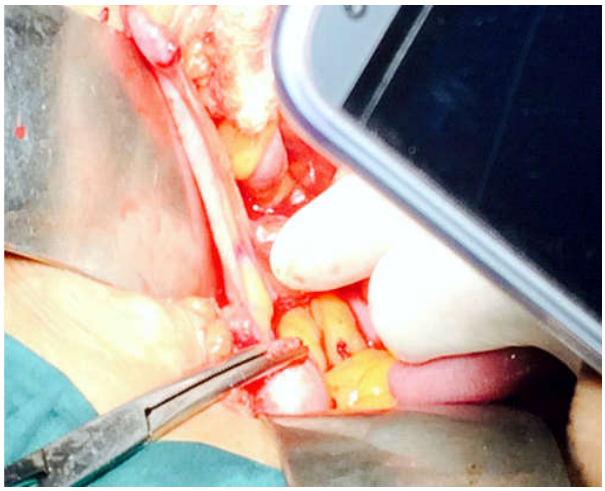

Fig. 1:

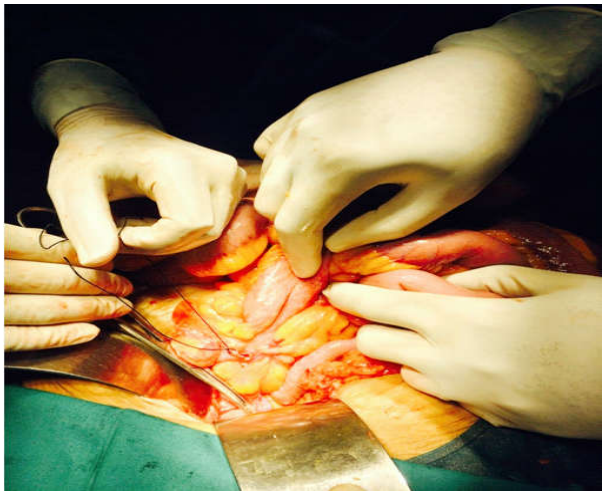

Fig. 1:

Post OP Finding

Laparotomy done under GA, midline incision was taken peritoneum was opened.

Intra OP Finding

There was mass in RIF which was attached to the right dome of bladder the mass was dissected the additions were released and there was a tubular structure which was connected to the cecum and the bladder. (Tubular structure was appendix) the bladder was dissected and bladder was repaired in layers with an SPC in situ and cecum repair was done with 3 0 silk, after complete hemostasis drain was placed and abdomen was closed under layers.

The specimen was sent for HPR

Conclusion

The ceacum was draining into the bladder through appendix.

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