Original Article

SAFETY AND EFFICACY OF PERCUTANEOUS RENAL BIOPSY AS SAME DAY OUTPATIENT PROCEDURE

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ABSTRACT:

BACKGROUND: Renal biopsy is the gold standard in nephrology, not only for diagnosis of renal diseases but also defining the management, prognosis and outcome.

OBJECTIVE: To assess the safety and efficacy of the renal biopsy as an outpatient basis procedure with same day admission and discharge.

DESIGN: Observational study.

MATERIALS AND METHODS: This study had been conducted at Nephrology Department, The Children's Hospital and The Institute of Child Health, Lahore form 15 January 2014 till 14 January 2015. Total of 169 paedaitric patients having kidney disease who underwent renal biopsy were included as their their admission day, discharge day, biopsy day and complications were taken in account as before procedure patients were screened for bleeding diathesis. After renal biopsy patients were monitored for any complication and patients who showed no complication and stable were discharged from hospital on same day of biopsy.

RESULTS: Total of 169 patients included, 109(64.5%) were male and 60(35.5%) were females. The age range was from 0.7 to 16 years. 59(34.9%) patients were admitted on same day and renal biopsy was done while 110(65.1%) patients were admitted before the procedure day for renal biopsy. Ninety patients were admitted one day prior for renal biopsy and renal biopsy was done next day. About 88.7% patients were discharged on same day after the procedures. Hematuria was observed in 4.7% patients.

CONCLUSION: Renal biopsy is a safe procedure which can be easily done and successfully accomplished as an outpatient procedure with minimum complications as this reduces financial and logistic burden.

KEY WORDS: Renal biopsy, outpatient procedure, safety.

INTRODUCTION:

Percutaneous renal biopsy has got central role in establishing diagnosis, therapeutic decisions, prognostic assessment and therapy guidance in kidney diseases[1]. The first percutaneous renal biopsy was done in 1951 by Iversen and Brun[2]. With the passage of time due to advances in imaging technology and with arrival of

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automated renal biopsy needles this procedure has become safe entity as it is considered the gold standard for diagnosis in renal patients[3]. It is mandatory to prepare and evaluate the patient for the procedure as surgical and radiological intervention back up should be kept ready in case of any complication[4]. Renal biopsy done under imaging guidance has got more safety profile with few complications as compare to blind technique[5]. It is considered a safe procedure as it can be performed as an outpatient procedure[6] as since 1980s the complications associated this procedure have substantially decreased due to use of automated spring-loaded renal biopsy needle[7]. The primary complications associated with this procedure are peri- / intra-renal hematoma formation and hematuria as it is an invasive procedure[8]. But most of complications are only minor and are of not clinical significance[9]. If risk factors such as bleeding diathesis and hypertension are controlled then major complications are quite rare[10]. Renal biopsy in paediatric patients is performed as an indoor procedure in most of the centers. The average stay of patient is about two days after renal biopsy procedure in uncomplicated cases[4]. The optimum period of bed rest and observation in hospital after the procedure is not well defined and if renal biopsy should be performed as an outpatient procedure[11]. In literature the incidence of complications reported for renal biopsy is 10-15% [12]. In one of the retrospective study conducted by Khajehdehi P et al [13] found that renal biopsy is safe a procedure as it can be done in outpatient settings. Some studies done in paediatric patients report that the renal biopsy can be done as an outpatient procedure if precautionary measures are taken[14]. In this study we performed and assessed the safety and efficacy of the procedure as an outdoor procedure.

PATIENTS/ MATERIALS AND METHODS:

It was an observational study that was conducted in the Department of Paediatric Nephrology at The Children's Hospital and The Institute of Child Health, Lahore over a period of one year from 15 January 2014 to 14 January 2015. The children aged less than 16 years of either sex suffering from kidney diseases that required renal biopsy for diagnosis and management were were included. Patients who were in critical condition or bleeding diathesis were excluded from study. Patients were given appointment for renal biopsy and called on day of renal biopsy. Only patients who were from too far flung area who could not reach hospital in time were admitted one night prior to biopsy day. All patients were examined for local/systemic infection and bleeding diathesis prior to the procedure. Blood pressure was monitored and controlled before renal biopsy. The laboratory investigations done prior to procedure were complete blood count (hemoglobin, hematocrit and platelet count) and coagulation profile as was ultrasound exam done in every patient. The other investigations i.e blood grouping and cross match was performed in patients undergoing renal biopsy as to transfuse blood products in case of bleeding. Patients were advised to keep nil per oral for about 4 hours prior to the procedure. Chloral hydrate along with Midazolam and / or pentazocin was used for sedation and nalbuphine for analgesia. The renal biopsy was done in prone position and sand bag was placed under the abdomen and lower ribs to compress the kidneys to the posterior abdominal wall and avoid possible complications. Nephrology fellow performed percutaneous renal biopsy under supervision of consultant Nephrologist. Ultrasound- guided biopsy was done from the lower pole of either kidney with automated biopsy needle. Vitals monitoring was closely done during sedation. After obtaining the renal tissue, pressure bandage was applied and vital signs were recorded. Patients were shifted to ward and kept in prone position to avoid bleeding from the biopsy site for at least three to four hours with close monitoring for any complication after renal biopsy. Those patients who remained hemodynamically stable and showed no sign of complication as gross hematuria, any sign of distress, pallor, severe pain at biopsy site, bleeding at biopsy site or soaking of dressing with blood and pain abdomen were discharged for home with advise to immediately come back to hospital emergency in case if patient experiences any complication. In case of mild pain at biopsy site oral paracetamol was advised. Patients were also advised to change dressing at the biopsy

site if no bleeding occurred. Renal biopsy specimens were fixed in 10% formalin and sent to histopathology department, where they were processed in automatic tissue processor. The SPSS 20.0 was used for data analysis.

RESULTS:

There were total 169 patients and out of these patients 109(64.5%) were male and 60(35.5%) were females. The age range was from 0.7 to 16 years with mean age of 7.83 years and SD of ±4.04. Total patients who were admitted on same day and renal biopsy was done on same day were 59(34.9%) and rest of 110(65.1%) patients were admitted before day of renal biopsy. Out of 110 patients, 90 patients were admitted one day prior to biopsy in ward and investigations were done to prepare patient for renal biopsy. Rest of the patients were either admitted in ward and planned for renal biopsy depending upon their fitness or admitted two days prior from OPD clinic as they travelled from far flung area. Patients who were stable after renal biopsy and showed no complication were discharged on same day after minimum observation period of eight hours. From total of 169 patients, 150(88.75%) patients were discharged on same day in evening. Rests of the patients were discharged after 24 to 96 hours post renal biopsy (Table I). Patients who were admitted on same day of biopsy were 59 and out of these 50 patients were discharged on same day. The main complication was gross hematuria and it was present in 8(4.7%) patients out of 169 patients. In patients who were admitted on same day for renal biopsy, hematuria occurred in 5(8.47%) out of total of 59 patients (Table II). Though not objective of study yet the most common diagnosis on histology was mesangioproliferative glomerulo--nephritis followed by membranoproliferative glomerulonephritis and SLE nephritis.

DISCUSSION:

Renal biopsy is considered as safe procedure in paediatric patients[15]. Though very rare yet serious complications such as AV fistula formation, blood products transfusion requirements, nephrectomy and even death can occur[16]. Ultrasound is a good in diagnosis of intra/perirenal hematoma[17]. As renal biopsy is a safe procedure and it can be done as an outpatient department procedure and with use of ultrasound guidance and automated biopsy needle the procedure ends with very few complications[18]. In one retrospective study done by Frank M et al[19] done in Germany showed that renal biopsy was done safely in 99% of patient with only complication rate of 4.1% while in our study the main complication was gross hematuria seen in 4.7% patients. So our study regarding safety and efficacy of renal biopsy is comparable to international standards. Another study done in Nigeria by Alebiosu CO et al[20] showed that they did renal biopsy in safe manner yet with macrohematuria as complication seen in 18.2% patients. In their study the inconclusive biopsy tissue was seen in 10.9% patients while in our study the inconclusive biopsy tissue was seen only in 1.8% patients, quite less than their study. One study conducted in adult patients by Al-Hweish AK et al[21], they compared two patient groups regarding safety and efficacy of same day renal biopsy and it was concluded that same-day renal biopsy and discharge could be undertaken without any increased risk of complications. Golay V[22] conducted one study in Eastern India which showed that out of total patients, in 28.5% patients renal biopsy was done as an outpatient basis and it was concluded that renal biopsy is so safe that it can be done as an outpatient procedure in low risk patients. This approach not only reduces cost of stay but also procedure can be done in more patients with decrease waiting time period.

Successful accomplishment of renal biopsy is to get enough tissue for diagnosis and also to perform renal safely, as the complication occurred in about 4% - 7% of patients[23]. One study done by Davis ID et al[24] showed the overall complications in 3.4% patients as compare to our study which showed complications in 4.7% patients and results of their study proposed that renal biopsy procedure can be done as an outpatient procedure. In another study by Al Makdama et al[25] done at one of institute in Saudi Arabia concluded that renal biopsy is a safe procedure which can be done on outpatient basis provided if patients have been screened to minimize the complications.

Patient stay in hospital after admission for renal

biopsy as indoor patient not only increases patient load and bed occupancy in wards but also increases financial implications for hospital especially in developing countries like Pakistan. It also utilizes hospital resources, logistic support and involves more manpower. It is safe to perform renal biopsy as an outpatient procedure, provided patients had been carefully screened and selected.

CONCLUSION:

Percutaneous renal biopsy is a safe procedure which can be easily and successfully performed as an outpatient procedure in selected patients after being screened for bleeding diathesis without any clinically significant complications. As this will not only decreases hospital stay but also reduces cost of procedure in form of professional and hospital charges.

Table I: Outpatient same day vs next day renal biopsy and stay duration

		Stay Duration					Total
		24 hours	24 Hours	48 hours	8 hours	96 hours	
Same day biopsy	Yes	5	1	3	50	0	59
	Next day	5	0	3	100	2	110
Total		10	1	6	150	2	169

Table II: Hematuria in patients

		Hematuria		Total
		No hematuria	hematuria	
Same day biopsy	Yes	54	5	59
	Next day	107	3	110
Total		161	8	169

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