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Renal biopsy associated complication in patients at an eastern India hospital

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Abstract
The renal biopsy is essential for the diagnostic of glomerular disease. However, it is an aggressive procedure with risk of complications. The aim of our study was to evaluate the complications directly related to percutaneous renal biopsy procedure in our centre. In this prospective study 200 patients underwent renal biopsy over 2 years from 2015 to 2017. In this prospective study 200 renal biopsies were performed in 130 males (60.9%) and 70 females (39.1%). The mean age of males were 36 ± 14.3 and in females mean age was 29.6 + 12.8 the most common age group biopsied was between 19-45yrs of age both among males (58.6%) and females (66.7) respectively. The number of patients below 18yrs of age were 36 (18.3%), 21 male and 15 female. Patients above the age of 45 were 20%. Pain was the most common complication in our study out of 200 patients 40.9% complained of some sort of pain during initial 24hrs of hospital stay. Second most common complication was gross hematuria 20%, hematoma in 9.3%, pylonephritis in 0.9%, AV fistula 0.9%. There was increased incidence of gross hematuria and hypotension in patients with prolonged prothrombin time with P value=0.035. The complications do occur with renal biopsy, but with proper pre and post procedure management they can be reduced significantly if not eliminated at all. In our study prolonged prothrombin time was associated with increased risk of hypotension and hematuria.

Keywords: Renal, Biopsy complication, Glomerular disease

Introduction
The renal biopsy (RB) technique was introduced in the early 19th and ever since has represented an indisputable study method of renal diseases, in particular the glomerular ones. Meanwhile, it is an invasive examination that should be individually indicated, depending on the clinical condition and the evaluation of the risks and benefits for each patient [1, 2]. Severe complications may arise such as macroscopic haematuria, perirenal haematoma, arteriovenous fistula, infection, damage to adjacent organs and even renal disease and death. European and American series publishing their experience report major complications at 1.2-6.6%. [3-7]. This data is vital to thoroughly inform the patient and obtain a signed informed consent. An article has recently been published about the 50th anniversary of the first RBs performed in Spain [8]. However, despite the extended time and experience with the RB technique, there are only two papers by nephrologists that analyse the complications associated with this technique [9, 10]. The significant complications related to renal biopsy are hemorrhage, development of arteriovenous fistulas, and to a lesser extent sepsis, the risks of complication vary from center to center and between practitioners but can be estimated to be between 3.5% and 13%, with the majority being minor complications (approximately 3% to 9%) [11-13]. Hematuria with drop in hemoglobin of ≥1 g/dl after biopsy is common and has been reported to occur in almost 50% of patients [14-16]. The main aim of our study is to evaluate the major and minor complications of renal biopsis.

Material and Methods
Patients who presented with clinical and/or laboratory features of renal disease were subjected to renal biopsy. All these patients were subjected to ultrasound guided Percutaneous Renal biopsy after ruling out cause of renal disease by other noninvasive methods. The information which was collected before biopsy included, Age, Sex, History of illness, Blood Pressure, KFT, Bleeding time clotting time, activated partial thromboplastin

time, Partial thromboplastin time, complete blood count, 24 hour urinary protein, routine urine examination, hepatitis B, C and HIV serology.

Percutaneous renal biopsy was performed with an automated spring loaded device with needle size of 14 to 18 G. The skin and subcutaneous tissue was anesthetized with lidocaine followed by deeper anesthesia with a spinal needle. The depth on was noted with an ultrasonogram and was confirmed with spinal needle. All the biopsies were done under the guidance of ultrasonogram. The biopsy needle was then introduced to the depth and engaged if the renal tissue was not obtained a deeper biopsy was performed. The biopsy was repeated until an adequate amount of tissue was obtained (usually three specimens). After the procedure patient was advised to lie flat on bed on his back and no activity was allowed for six hours and was observed for 24hrs for any complication. Patient blood pressure for initial 3 hours was monitored every 30 minutes then hourly for 5 hours then 4 hourly for 16 hrs. Patient was monitored for Hematuria, pain, fever, and any other complication post biopsy Hemoglobin was done after 24hrs of biopsy to see for drop in hemoglobin. Patient was reviewed after one week on OPD basis and USG abdomen was done to rule out AV fistula.

Results

In this prospective study 200 renal biopsies were performed 130 males (60.9%) and 70 females (39.1%). The mean age of males were 36 ± 14.3 and in females mean age was 29.6 + 12.8 the most common age group biopsied was between 19- 45yrs of age both among males (58.6%) and females (66.7%). The number of patients below 18yrs of age were 36, 18.3%, Patients above the age of 45 were 41 (20%) 33 male and 8 females (Table-1).

Table 1: Showing age and gender distribution

Age (yr)	Male		Female		Total	
	N	%	N	%	N	
≤ 18	21	15.7	15	22.2	36	18.3%
19 to 45	76	58.6	47	66.7	123	61.7%
> 45	33	25.7	8	11.1	41	20.0%
Total	130	60.9	70	39.1	200	100.%
mean ± SD	36.0 ± 14.3 (9, 70)		29.6 ± 12.8 (13, 60)		33.5 + 14.0 (9, 70)	

In our study of 200 patients the indication for renal biopsy was Protinuria and Hematuria (22%) isolated subnephrotic protinuria (22.6%) Nephrotic syndrome (21.7%) ARP (5; 2%) systemic disease (3.5%) Subnephrotic Protinuria wih azotemia (20%) and post renal transplant azoteamia. Pain was the most common complication in our study out of 200 patients 40.9% complained of some sort of pain during first 24hrs of hospital stay however only 26% patients needed analgesia while rest were able to tolerate pain which was mostly posture related. The second most common complication was gross hematuria in 20% patients which was evident in initial 12 hrs in almost all 41 patients post biopsy. 33 patients (14.8%) had greater than 2g drop in haemoglobin however the hematuria settled within 24hrs in 33 patient after biopsy the hematuria persisted in 4.3% patients for more than 24hrs and these patients had drop of hemoglobin by more than 2g/dl and needed blood transfusion for stabilizing hemodynomics. Gross hematuria for more than 24hrs especially if patient becomes hemodynomically unstable in considered as major complication of renal biopsy. The study revealed that patients with prolonged PT (prothrombin time) have increased incidence of drop in hemoglobin and hypotension (Table. 2).

Table 2: Showing complications of renal biopsy in our study

Complication	No.of patients	%
Gross Hematuria	40	20.0
Pain	82	40.9
Infection	2	0.9
Hematoma	19	9.6
A V Fistula	2	0.9
Hypotension	8	4.3
Need for Blood Transfusion	8	4.3

Discussion

It is unquestionable that the percutaneous RB is a vital helpful apparatus in the investigation of renal illnesses and it is likewise our obligation to improve this system and assess our circumstance in connection to the conceivable related complexities. Hence, the snapshot of playing out the methodology, the vital experience of the specialist and the potential complexities are matters that should be assessed in the present. Moreover, we have goal of drafting our own educated assent, which incorporates our experience in the course of the most recent decade. We would now be able to assert that percutaneous RB is a generally safe method, the vast majority of the difficulties are minor, with no clinical repercussions, in spite of the fact that this methodology ought to be acted in a taught way, maintaining a strategic distance from hazard factors and observing the presence of potential complexities.

In our examination there was no mortality and no requirement for an obtrusive system, as nephrectomy,of embolisation. In any case, complexities occurred in 20% of biopsies, and 5.2% of inconveniences were viewed as major, essentially due to the requirement for transfusion after biopsy in 4.3% (Table-3) cases,and sepsis in 0.9% paients (Table-2). Lefaucheur *et al*. [17] revealed 6 to 7% frequency of significant difficulties that is requirement for blood transfusion and additionally need of surgery to balance out the patient.

Table 3: Showing pre and post biopsy hemoglobin. greater than 2 g/dl drop in hemoglobin was noticed in 14.8% patients

		No. of patients	%	p value
Baseline Hemoglobin (gm%)		10.98 ± 2.38 (7.0, 16.3)		
Post Biopsy Hemoglobin (gm%)		10.15 ± 2.19 (5.1, 15.3)		
Drop in Hb	Unchanged	28	13.9	0.000 (Sig)
	<1 .0	103	51.3	
	1.0 to 2.0	40	20.0	
	> 2.0	29	14.8	

Post biopsy hemoglobin remained unchanged in 28 patients (13.9%). Drop in hemoglobin less than 1g/dl was noticed in 103 patients (51.3%), 1-2 g/dl drop in hemoglobin was seen in 40 patients (20%) and significant drop of more 2g/dl was noticed in 29 patients (14.8%), however most of these patients remained hemodynomicaly stable only 7 patients needed transfusion because of hypotension. Ishikawa *et al.* [18] reported the incidence of drop in hemoglobin more than 1g/dl in 20.8% patients which is consistent with our study.

In a study by William *et al*. [19] a post-biopsy decrease in hemoglobin of ≥1.0 g/dl was observed in 46% of cases and a decrease of ≥2.0 g/dl was observed in 9.6% of cases. In biopsies with a complication, a postbiopsy decrease in hemoglobin of ≥1.0 g/dl was observed in 89% of cases (uncomplicated versus complicated, *P*< 0.0001) and a decrease of ≥2.0 g/dl was observed in 48% of cases (uncomplicated versus complicated, *P*< 0.0001). These results reveal little less incidence of greater than 2 gram/dl drop in haemoglobin than our study.

Conclusion

Renal biopsy is one of the most significant diagnostic methodology with nephrologists. The entanglements do happen with the methodology, however with legitimate pre and post strategy management they can be decreased fundamentally if not wiped out in our investigation, there was expanded rate of gross hematuria and hypotension in patients with delayed PT with P value=0.035. There was no mortality in our investigation and no surgical intervention was needed for any complication.

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