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ORIGINAL ARTICLE

To Compare Frequency of Complications of 18 Gauge Needle with 16 Gauge Needle in patients undergoing Renal Biopsy

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ABSTRACT

Aim: To compare frequency of complications of 18 gauge needle with 16 gauge needle in patients undergoing renal biopsy.
Duration of study: 6 months i.e.01-07-18 to 31-12-18
Method: Randomly allocated by a computer generated random number. Sample size was 560 patients. Two equal groups A and B. 16 gauge needles were used in A and 18 gauge needles were used in B each with 280 cases. Ultrasound guided biopsies were done. An automatic biopsy gun was used. The patients were instructed to lie on bed on their back for 4-6 hours post procedure. All the information was collected on a specially designed Performa.
Result: Complications of patients undergoing renal biopsy shows perinephric hematoma in 6(2.14%) cases in A and 9(3.21%) cases in B with p value 0.43, macroscopic hematuria in A is 5(1.79%) cases and 3(1.07%) cases in B with p value 0.47. Retroperitoneal hemorrhage was recorded in 3(1.07%) cases in A and no case in B and p value was 0.08.
Conclusion: Both 16 gauge needle and 18 gauge needles are equally effective in renal biopsy in terms of less complication (peri nephric hematoma, macroscopic hematuria and retroperitoneal hemorrhage).
Keywords: Renal biopsy, 16 gauge needle, 18 gauge needle, perinephric hematoma, retroperitoneal hemorrhage

INTRODUCTION

Renal biopsy is an essential means in the diagnosis, prognosis and managing of patients with renal diseases. Renal biopsies have been done for more than a century. The first explanation of a biopsy system was available by Ball in the 1930s and percutaneous renal biopsy (PRB) method was established in the 1940s[2]. It provides the vital diagnostic and prognostic information which plays a fundamental task in making the suitable management plans. Since its beginning in the 1950s, a variety of technical advances has been made in performing PRBs which have enhanced the diagnostic acquiesce as well as protection of the procedure[3].

PRB carries the hazard for a number of problems. Among these, bleeding is the most common complication, which can range from asymptomatic bleeding to life-threatening bleeding. The mainstream of patients (90%) practice only an uncomplicated hematoma and 1-10% show transient macroscopic hematuria[4].

Most important advance in biopsy process have appreciably improved the competence of this method i.e., uses of ultrasound for needle guidance and foreword of automatic biopsy needles[5].

However, in absence of local data, our results are primary and need validation through some other local studies.

METHODS

Five hundred and sixty patients were randomly allocated by a computer generated random number table in two equal groups. a 16 gauge needle was used in group A and an 18 gauge needle was used in group B. Ultrasound guided biopsies were done. An automatic biopsy gun was used. The patients were instructed to lie on bed on their back for 4-6 hours post procedure. All the information was collected on a specially designed proforma.

Inclusion criteria:

- Both male and female patient's ages range from 15-60 years.
- Patients undergoing renal biopsy for acute kidney injury (serum creatinine ≥0.3mg/dl), nephrotic syndrome (protein/creatinine ratio >3) or rapidly progressive glomerulonephritis.

Exclusion criteria:

- Patients who have INR >1.3, Platelets<50000 cells/mm^3
- Uncontrolled hypertension (BP >160mmHg systolic and >90mmHg diastolic
- Antiplatelet use (such as Aspirin &Clopidogrel) within 7 days before biopsy
- Polycystic kidneys proven by ultrasound
- Patients with acute exacerbation of chronic obstructive pulmonary disease, CLD, cardiac failure and stroke.

The data was entered and analyzed in SPSS version 20. Post stratification chi-square test was applied. P-value ≤0.05 was considered significant.

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RESULTS

A total of 560 (280 in each group) fulfilling the criteria were enrolled.

Table 1: Age Allocation

	A		B	
Ages(yrs)	**n=**	**%age**	**n=**	**%age**
15-30	76	27.14	77	27.5
31-60	204	72.86	203	72.5
Total	280	100	280	100
Mean±SD	39.02±10.32		39.6±10.67	

Table 2: Gender distribution

	A		B	
Gender	**n=**	**%age**	**n=**	**%age**
Male	134	47.86	135	48.21
Female	146	52.14	145	51.79
Total	280	100	280	100

Table 3: Mean duration

	A	B
Duration of disease (months)	Mean±SD	Mean±SD
	5.43±1.57	5.73±1.50

Table 4: Complications of 18 gauge needle with 16 gauge

Complications	A		B		**significance**
	n=	**%age**	**n=**	**%age**	
Perinephric hematoma	6	2.14	9	3.21	0.43
Macroscopic hematuria	5	1.79	3	1.07	0.47
Retroperitoneal hemorrhage	3	1.07	0	0	0.08

Table 5: Stratification of complications of 18 gauge needle with 16 gauge needle with regards to age

Complications			Groups		Significance
			A	B	
Perinephric hematoma	Age(yrs)	Present			
	15-30	Yes	3	1	0.30
		No	73	76	
	31-60	Yes	3	8	0.13
		No	201	195	
Macro-scopic hematuria	15-30	Yes	2	1	0.55
		No	74	76	
	31-60	Yes	3	2	0.65
		No	201	201	
Retroperi-toneal hemorrhage	15-30	Yes	1	0	0.31
		No	75	77	
	31-60	Yes	2	0	0.15
		No	202	203	

Table 6: Stratification of complications of 18 gauge needle with 16 gauge needle with regards to gender

Complications			Groups		P value
			A	B	
Perinephric hematoma	Gender	Present			
	Male	Yes	3	1	0.31
		No	131	134	
	Female	Yes	3	8	0.12
		No	143	137	
Macroscopic hematuria	Male	Yes	4	1	0.17
		No	131	134	
	Female	Yes	1	2	0.55
		No	145	143	
Retroperi-toneal hemorrhage	Male	Yes	2	0	0.15
		No	132	135	
	Female	Yes	1	0	0.31
		No	145	145	

Table 7: Stratification of complications of 18 gauge needle with 16 gauge needle with regards to duration of disease

Complications			Groups		P value
			A	B	
Perinephric hematoma	Duration	Present			
	Upto 3 months	Yes	3	2	0.74
		No	35	17	
	>3 months	Yes	3	7	0.24
		No	239	254	
Macroscopic hematuria	Up to 3 months	Yes	1	0	0.47
		No	37	19	
	>3 months	Yes	4	3	0.63
		No	238	258	
Retroperitoneal hemorrhage	Up to 3 months	Yes	0	0	-
		No	38	19	
	>3 months	Yes	3	0	0.07
		No	239	261	

DISCUSSION

In our study, mean age was 39.02±10.3 yrs in A and 39.6±10.7 yrs in B. Regarding gender, males were of 134(47.86%) in A and 135(48.21%) in B whereas females were of 146(52.14%) in A and 145(51.79%) in B. Complications of 18 gauge needle with 16 gauge in patients undergoing renal biopsy shows peri nephric hematoma in 6(2.14%) cases in A and 9(3.21%) cases in B with level of significance 0.43, macroscopic hematuria in 5(1.79%) cases in A and 3(1.07%) cases in B with p=0.47 and retroperitoneal haemorrhage in 3(1.07%) cases in A and no case in B group with significance of 0.08.

We compared our results with previous studies, where by using 18 gauge needle biopsy, perinephric hematoma, macroscopic hematuria and retroperitoneal hemorrhage were found in 27.27% (18/66) patients, 0% and 62.12% (41/66) patients respectively[6]. By using 16 gauge needle biopsy, perinephric hematoma, macroscopic hematuria and retroperitoneal hemorrhage were found in 0.4%, 14.3% and 2.2% patients respectively[7,4,8]. In another study, no difference was found in the frequency of complications between the 16G and 18G groups (Perinephric hematoma 2% *vs* 2.2% *P* = 0.77, macroscopic hematuria 1.6% *vs* 0.6% *P* = 0.48, retroperitoneal hemorrhage 0.7% *vs* 0% *P*=0.59)[5]. The findings of our study are supported with the hypothesis that there is no significant difference in both groups, however, frequency of perinephric hematoma and macroscopic hematuria was higher in 16G needle group while no case of retroperitoneal hemorrhage was recorded in 18G needle.

Considering the findings of studies mentioned helped us to justify the hypothesis “Both 16 gauge needle and 18 gauge needle are equally effective in renal biopsy in terms of less complications (perinephric hematoma, macroscopic hematuria and retroperitoneal hemorrhage)”.However, in absence of local data, our results are primary and need validation through some other local studies.

CONCLUSION

Both 16 gauge needle and 18 gauge needle are equally effective in renal biopsy in terms of less complications (perinephric hematoma, macroscopic hematuria and retroperitoneal haemorrhage).

Authorship and contribution declaration: Each author of this article fulfilled following Criteria of Authorship:

1. Conception and design of or acquisition of data or analysis and interpretation of data.
2. Drafting the manuscript or revising it critically for important intellectual content.
3. Final approval of the version for publication.

All authors agree to be responsible for all aspects of their research work.

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REFERENCES

1. Prasad N, Kumar S, Manjunath R et al. Realtime ultrasound-guided percutaneous renal biopsy with needle guidance by nephrologists decreases post-biopsy complications. Clin Kidney J. 2015;8:151-6.
2. Tondel C, Vikse BE, Bostad L et al. Safety and complications of percutaneous kidney biopsies in 715 children and 8573 adults in Norway 1988– 2010. Clin J Am Soc Nephrol. 2012;7:1591–7.
3. Yaqub S, Ahmed N, Fatima U et al. Complication rate and diagnostic yield of percutaneous native kidney biopsies: a 10-year experience at a tertiary care hospital in Pakistan. Saudi J Kidney Dis Transpl.2017;28:891-7.
4. Chikamatsu Y, Matsuda K, Takeuchi Y et al. Quantification of bleeding volume using computed tomography and clinical complications after percutaneous renal biopsy. ClinKidneyJ.2017;10:9-15.
5. Mai J, Yong J, Dixson H et al. Is bigger better? A retrospective analysis of native renal biopsies with 16 gauge versus 18 gauge automatic needles. Nephrology (Carlton).2013;18:525-30.
6. Redfield RR, McCune KR, Rao A et al. Nature, timing, and severity of complications from ultrasound-guided percutaneous renal transplant biopsy. Transpl Int.2016;29:167-72.
7. Ali H, Murtaza A, Anderton J et al. Post renal biopsy complication rate and diagnostic yield comparing hands free (ultrasound-assisted) and ultrasound guided\biopsy techniques of renal allografts and native kidneys. Springerplus. 2015; 4:491.
8. Lees JS, Mc Quarrie EP, Mordi N et al. Risk factors for bleeding complications after nephrologist-performed native renal biopsy. ClinKidney J. 2017;10:573–7.

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