Risk factors associated with bleeding complications after native renal biopsy

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Introduction and Objectives

Bleeding is a risk after percutaneous renal biopsy[1,2]. Antiplatelet and anticoagulant agents are commonly being taken by patients requiring renal biopsy, and many centres discontinue them because of a perceived higher risk (or greater severity) of post-procedure bleeding[3]. This study was designed to examine factors associated with complications after percutaneous renal biopsy.

Methods

Retrospective study of consecutive adult patients undergoing native renal biopsy in the Glasgow Renal and Transplant Unit from 2000 to 2014. Data relating to indication for biopsy and complications were recorded on the electronic patient record contemporaneously. Biopsies conducted using real time USS guidance and 16G spring loaded Bard Max Core biopsy guns. To minimise bleeding risk, the following pre-biopsy parameters are used as a guide: prothrombin time (PT) <15 seconds; platelet count ≥100 x 10^9/L and blood pressure controlled. Aspirin was routinely continued but clopidogrel and warfarin stopped. Bleeding times were not checked and pro-coagulants were not administered. Data were extracted from the electronic patient record for biopsy indication, pre-biopsy haemoglobin, platelet count, PT, estimated glomerular filtration rate (eGFR), serum creatinine, urinary protein creatinine ratio, body mass index (BMI), use of antiplatelets or anticoagulants and diagnosis. We defined major complication post-biopsy as need for blood transfusion, surgical or radiological intervention, or death. Binary logistic regression analysis was used to assess factors associated with increased risk of major complication.

Results

1. Overall complication rate is low, but more common in biopsies conducted as emergency

	All biopsies (n=2619)	Elective (n=1536)	Emergency (n=1083)	P (chi square
Transfusion	47 (2.2%)	14 (0.9%)	33 (3.0%)	<0.001
Embolisation	10 (0.4%)	3 (0.2%)	7 (0.6%)	0.065
Death*	1 (0.04%)	1		
Major bleed	**55 (2.1%)**	**18 (1.2%)**	**37 (3.4%)**	**<0.001**

***Death occurred as a late complication (day 12 post biopsy) after warfarin recommenced for recurrent VTE**

2. Increasing age and decreasing eGFR are associated with increased bleeding risk

	OR	95% CI	P
Increasing age	1.025	1.007-1.043	0.006
Decreasing eGFR	1.034	1.050-1.018	<0.001
Systolic BP	1.018	0.996-1.040	0.113
BMI >30	0.363	0.105-1.254	0.154
Proteinuria, prothrombin time, platelets not associated with increased risk			

3. Aspirin is not associated with increased bleeding risk

	Taking aspirin (n=342)	Not taking aspirin (n=1222)	P (chi square)
Embolisation	1 (0.3%)	7 (0.6%)	0.81
Transfusion	5 (1.5%)	23 (1.9%)	0.85
Major complication	7 (2.0%)	28 (2.3%)	0.93
No increased risk of bleeding in patients taking clopidogrel (n=14; 7 elective, 7 emergency). No increased bleeding when warfarin stopped in advance of biopsy (n=64).			

4. Complications, particularly transfusion, are more common in patients with vasculitis**

	N	Transfusion	Embolisation	Major bleed
GN, including IgA/HSP	1172 (44.7%)	12	3	14
Vasculitis, including AAV	339 (12.9%)	**14 (4.1%)**	**2 (0.6%)**	**17 (5.0%)**
Lupus nephritis	116 (4.4%)	3	1	3
Interstitial disease	203 (7.8%)	4	0	4
Acute tubular injury	98 (3.7%)	0	0	0
Chronic ischaemia	149 (5.7%)	0	1	2
Diabetic nephropathy	142 (5.4%)	4	0	4
Amyloid/ myeloma	141 (5.4%)	1	0	1
Other diagnosis	89 (3.4%)	4	3	5
Non-diagnostic	170 (6.5%)	5	0	5

****Not known if transfusion was necessary due to a complication of renal biopsy, or related to the underlying vasculitis or its treatment**

Conclusion

The risk of major bleeding following native renal biopsy in the modern era is low. Complications are relatively more common when biopsy is conducted as an emergency, which has implications for obtaining informed consent. Obesity does not appear to be a risk factor for major bleeding. In the absence of large-scale, randomized clinical trials, our data support the routine continuation of aspirin at time of renal biopsy.

References

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Topic: Chronic kidney disease: pathophysiology, progression and risk factors

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