SECTION M SCOTTISH RENAL BIOPSY REGISTRY: SURVEY OF TRANSPLANT KIDNEY BIOPSY IN SCOTLAND 2016

All renal units in Scotland were able to provide date of procedure, date of birth, sex, and main diagnosis for all transplant renal biopsies performed in the calendar year 2016. Biopsy diagnosis was selected from a bespoke codeset agreed by the SRR Biopsy Steering Group (see M3 below). Renal units also provided indication for biopsy, selected from pre-defined terms. Biopsies at the time of transplant ('implantation biopsies', 'time zero biopsies') were not included.

The total number of reported transplant biopsies was 319 in 229 patients giving an incidence of 59.0 transplant biopsies per million population (pmp) per year, down from 70.6 pmp in 2015.

This amounts to 0.12 biopsies per prevalent transplant recipient using the Scottish Renal Registry reported prevalent transplant patient data from 31 December 2015.

Total number of biopsies and total number of patients having transplant renal biopsy in each centre were expressed pmp and per prevalent transplant patient and for each centre based on the populations shown in M1.

M1 Number of transplant biopsies in each renal unit 2016

Renal unit	NHS Board	Population 2016	Prevalent transplant patients 31/12/2015	Total transplant biopsies 2016	Total number patients having biopsy	Transplant biopsies pmp/year	Patients having transplant biopsies pmp/year	Transplant biopsies per prevalent transplant patient/yr
ARI	GRAM + SHET + ORKN	633150	299	38	27	60.0	42.6	0.13
XH	A&A	370560	195	4	4	10.8	10.8	0.02
DGRI	D&G	149520	71	0	0	0.0	0.0	0.00
GLAS	GG&C + FV	1465850	842	134	108	91.4	73.7	0.16
MONK	LAN	654490	370	0	0	0.0	0.0	0.00
NINE	TAY	415470	198	11	9	26.5	21.7	0.06
RAIG	HIGH + WI	348800	194	15	13	43.0	37.3	0.08
RIE	LOTH + BORD	994530	432	102	66	102.6	66.4	0.24
VHK	FIFE	370330	170	15	12	40.5	32.4	0.09
East		2762280	1293	181	117[a]	65.5	42.4	0.14
West		2640420	1478	138	112[a]	52.3	42.4	0.09
Scotland		**5402700**	**2771**	**319**	**229[a]**	**59.0**	**42.4**	**0.12**

a. 10 patients had a transplant biopsy in 2 different centres during 2016.

Some centres perform no transplant biopsies or only a proportion of the transplant biopsies for patients from their NHS Board area with the others being performed at the relevant transplant centre. For this reason, all analyses include a comparison of the NHS Board areas served by the Glasgow (West) transplant unit (A&A, D&G, GG&C, FV, LAN) and Edinburgh (East) transplant unit (GRAM, SHET, ORKN, TAY, HIGH, WI, LOTH, BORD, FIFE).

M2 Indication for transplant biopsy 2016

	ARI	XH	DGRI	GLAS	MONK	NINE	RAIG	RIE	VHK	East	West	Scotland
Surveillance during delayed graft function	1	0	0	14	0	0	0	23	0	24	14	38
Achieved transplant function lower than expected	8	0	0	10	0	4	1	0	1	14	10	24
AKI	8	0	0	43	0	2	4	53	5	72	43	115
Assessment of response to treatment of rejection	7	0	0	0	0	0	2	6	0	15	0	15
Assessment of response to BK virus treatment	0	0	0	0	0	0	0	0	1	1	0	1
Protocol (surveillance) biopsy	2	0	0	0	0	0	0	7	0	9	0	9
Chronically deteriorating transplant function and proteinuria	2	2	0	15	0	0	4	1	3	10	17	27
Chronically deteriorating transplant function only	9	2	0	45	0	1	4	7	5	26	47	73
Preserved transplant function and proteinuria	0	0	0	0	0	0	0	0	0	0	0	0
Nephrotic Syndrome	1	0	0	3	0	4	0	0	0	5	3	8
Other	0	0	0	4	0	0	0	5	0	5	4	9

There were no biopsies without a recorded indication.

M3 Histopathological diagnosis made from transplant biopsy 2016

	ARI	XH	DGRI	GLAS	MONK	NINE	RAIG	RIE	VHK	East	West	Scotland
Acute tubulodegenerative change (ATN)	1	0	0	20	0	0	0	32	0	33	20	53
Rejection: ACR (1A)	3	0	0	13	0	0	0	0	2	5	13	18
Rejection: ACR (1B)	1	0	0	4	0	0	0	1	0	2	4	6
Rejection: ACR (2A, 2B, 3)	1	0	0	17	0	1	0	3	0	5	17	22
Rejection: ACR (NOS)	0	0	0	0	0	0	0	10	0	10	0	10
Rejection: acute / active ABMR	0	0	0	0	0	0	0	1	0	1	0	1
Rejection: borderline	1	1	0	7	0	0	0	4	2	7	8	15
Rejection: chronic ABMR	0	1	0	4	0	0	2	2	1	5	5	10
Rejection: chronic allograft arteriopathy	0	0	0	0	0	0	0	0	1	1	0	1
Rejection: chronic, active ABMR	0	1	0	7	0	0	0	2	0	2	8	10
Rejection: mixed ABMR & ACR	0	0	0	0	0	0	0	1	0	1	0	1
Rejection - other	0	0	0	0	0	0	0	0	0	0	0	0
BKVAN	3	0	0	9	0	0	0	3	2	8	9	17
Recurrent disease	2	0	0	7	0	4	0	1	0	7	7	14
CNI toxicity	6	1	0	2	0	0	3	3	0	12	3	15
IFTA	7	0	0	4	0	2	1	13	1	24	4	28
iIFTA	0	0	0	4	0	0	0	0	0	0	4	4
Donor disease	1	0	0	0	0	3	1	6	0	11	0	11
Infection (other than BKVAN)	0	0	0	0	0	0	0	3	0	3	0	3
No significant histopathological abnormality	8	0	0	6	0	0	1	14	6	29	6	35
Insufficient Tissue for Diagnosis	0	0	0	6	0	1	0	1	0	2	6	8
Other	4	0	0	24	0	0	7	1	0	12	24	36
Not stated	0	0	0	0	0	0	0	1	0	1	0	1

ACR = acute cellular rejection, 1A, 1B, 2A, 2B, 3 refer to Banff classification
ABMR = antibody mediated rejection
BKVAN = BK virus associated nephropathy
CNI = calcineurin inhibitor
IFTA = interstitial fibrosis and tubular atrophy
iIFTA = inflammatory interstitial fibrosis and tubular atrophy

Nephrologists were asked to select the diagnosis that was the main explanation for the clinico-pathological features.

M4 Clinician who performed the transplant biopsies in each renal unit 2016					
Renal unit	**Radiologist**	**Consultant nephrologist**	**Nephrology trainee**	**Transplant surgeon**	**Not stated**
ARI	0	21	17	0	0
XH	3	1	0	0	0
DGRI	0	0	0	0	0
GLAS	0	8	121	2	3
MONK	0	0	0	0	0
NINE	0	9	2	0	0
RAIG	12	3	0	0	0
RIE	99	0	0	0	3
VHK	0	15	0	0	0
Total	**114**	**57**	**140**	**2**	**6**

M5 Major complications	
Complication	**n**
Arteriography and embolisation	0
Arteriography no embolisation	0
Blood transfusion only	1
Clot obstruction managed conservatively	0
Clot obstruction requiring intervention	0
Death	0
Nephrectomy	0
Other please specify	0
Surgery no nephrectomy	1
Total	**2**

There were 2 major complications (0.6%) with no loss of transplant kidney or death.

This is the second consecutive analysis of all transplant kidney biopsies in Scotland in a calendar year.

Analysing the data by region (East v West) demonstrates a higher incidence of transplant biopsies in the East region (65.5 v 52.3 pmp) despite a higher incidence of kidney transplantation in the West region. The difference is not as great as in 2015 (92.1 v 45.5 pmp). Interestingly the difference is accounted for by repeat biopsies in the same patients since the incidence of patients having at least one transplant biopsy in the two regions is exactly the same (42.4 pmp).