

An audit on incidence of acute kidney injury and post-operative outcomes in patients undergoing colorectal surgery at a district general hospital in Scotland

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Background

Post-operative Acute Kidney Injury (AKI) has been previously associated with increased risk of morbidity, mortality, progression to chronic kidney disease (CKD) and longer hospital stay [1-3]. It is therefore important to identify and correct AKI in patients at risk in order to optimise outcomes.

Aims

- Describe the demographics, AKI incidence and outcomes in patients receiving colorectal surgery at a district general hospital (DGH) in Scotland.
- Underline the importance of early detection of patients at risk of post-operative AKI and identify a possible tool suitable for risk stratification

Methods

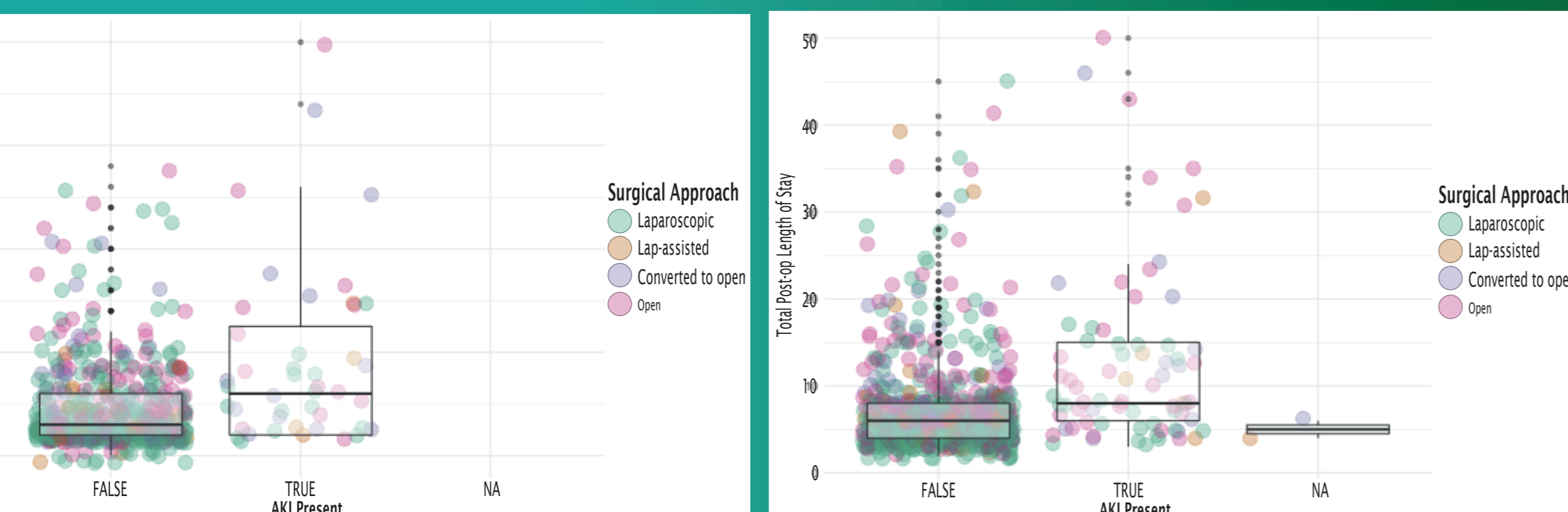
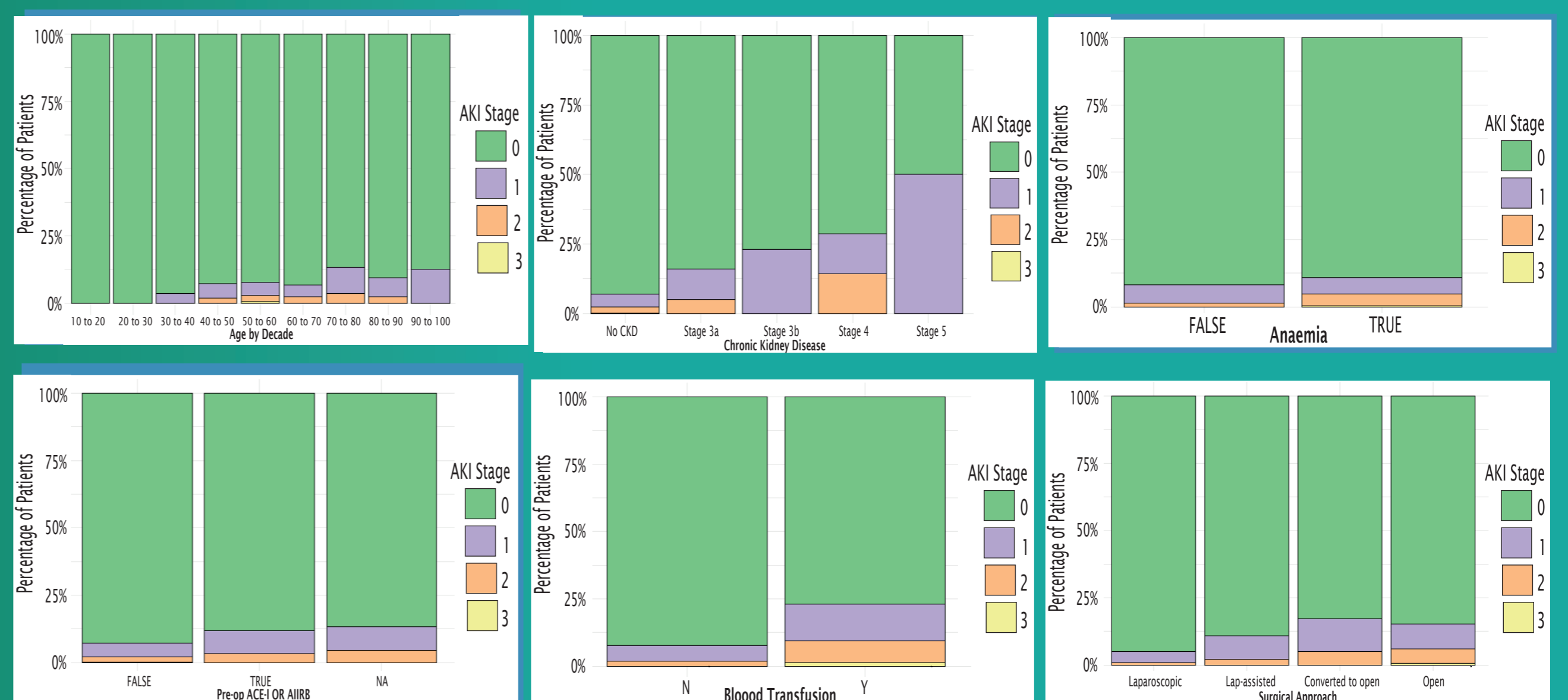
Patients aged 18+ who underwent elective colorectal surgery between February 2016 and December 2020 were included. The data were collected as part of the National Enhanced Recovery Colorectal Initiative (NERCI). Additional data (biochemistry/haematology results) were collected with local and national Caldicott Approval. AKI was defined using the Kidney Disease: Improving Global Outcomes (KDIGO) definitions[4].

Results

Table 1. displays basic characteristic data for the 798 patients included in the study. 9% of the population developed post-operative AKI. When comparing the post-operative AKI and non-AKI groups, patients were more likely to develop an AKI if they were older, had CKD, were anaemic or used ACE-I/ARBs.

	All included patients (n=798)	Patients who developed AKI (n=73)	Patients without AKI (n=723)
AGE Median (Range)	798 (100%) 68 (19-95)	73 (100%) 72 (39-91)	723 (100%) 68 (19-95)
SEX			
M	380 (47.6%)	43 (58.9%)	379 (52.4%)
F	418 (52.4%)	30 (41.1%)	344 (47.6%)
ASA Grade			
1	121 (15.2%)	8 (11.0%)	113 (15.6%)
2	450 (56.4%)	32 (43.8%)	416 (57.5%)
3	216 (27.0%)	31 (42.5%)	185 (25.6%)
4	11 (1.4%)	2 (2.7%)	9 (1.3%)
Pre-op e-GFR	Vn=797*		
>60	664 (83.3%)	48 (65.8%)	615 (85.0%)
30-60	124 (15.6%)	22 (30.1%)	102 (14.1%)
15-30	7 (0.9%)	2 (2.7%)	5 (0.7%)
<15	2 (0.2%)	1 (1.4%)	1 (0.2%)
Anaemia	Vn=797*		
Yes	267 (33.5%)	29 (39.7%)	238 (32.9%)
No	530 (66.5%)	44 (60.3%)	485 (67.1%)
ACE-I use	Vn=748*	Vn=64*	Vn=683*
Yes	214 (28.6%)	25 (39.0%)	188 (27.5%)
No	534 (71.4%)	39 (61.0%)	495 (72.5%)
Approach			
Laparoscopic	476 (59.6%)	24 (32.9%)	452 (62.5%)
Lap-assisted	46 (5.8%)	5 (6.8%)	40 (5.5%)
Open	194 (24.3%)	30 (41.1%)	164 (22.7%)
Converted to open	82 (10.3%)	14 (19.2%)	67 (9.3%)

Table 1. Demographics, pre-operative characteristics and type of surgery, including AKI and no-AKI groups. Vn*= valid number for data category.



Patients with AKI were more likely to stay in hospital longer, require peri-operative transfusions be admitted to critical care and to die (Table 2).

	All included patients (n=798)	Patients who developed AKI (n=73)	Patients without AKI (n=723)
Length of Stay Median (Range)	6 (2-50)	9 (3-50)	6 (2-45)
Transfusion	Vn=797*		
Yes	74 (9.3%)	17 (23.3%)	57 (7.9%)
No	723 (90.7%)	56 (76.7%)	666 (92.1%)
AKI	Vn=796*		
0	723 (90.8%)	0 (0.0%)	723 (100.0%)
1	52 (6.5%)	52 (71.2%)	0
2	20 (2.5%)	20 (27.4%)	0
3	1 (0.2%)	1 (1.4%)	0
ICU admission			
Yes	22 (2.8%)	10 (13.7%)	12 (1.7%)
No	776 (97.2%)	63 (86.3%)	711 (98.3%)
Death at 90 days	Vn=766*	Vn=70*	Vn=694
Yes	16 (2.0%)	6 (8.6%)	10 (1.4%)
No	750 (98.0%)	64 (91.4%)	684 (98.6%)

Table 2. Post-operative outcomes, including AKI and no-AKI groups. Vn*= valid number for data category

Discussion and Conclusions

One in ten patients who underwent colorectal surgery at a DGH in Scotland developed post-operative AKI, which was associated with poorer outcomes. Currently, efforts are made to introduce a pre-assessment AKI tool for early identification of high risk patients. This would consist of a 'High Risk of AKI' sticker applied to the patients' notes during pre-assessment clinic, encouraging accurate fluid balance, avoiding hypotension and cautious use of certain drugs (NSAIDs, ACEi/ARB) in post-operative period.

References

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4. KDIGO. Clinical Practice Guideline for Acute Kidney Injury. Kidney Int Suppl 2012;2:1-33138