INTRODUCTION: Vascular access is the lifeline of the haemodialysis patient. The recommended gold standard for vascular access is either an arteriovenous fistula (AVF) or an arteriovenous graft (AVG). Thrombosis of access can lead to loss of definitive access with significant morbidity and mortality. Several tools are available for vascular access surveillance. The UK RA does not have specific guidelines for vascular surveillance due to lack of evidence but encourages use of local protocols.1

OBJECTIVES: We instigated a local protocol for measuring access flows using the Transonic© flow monitor. We aimed to assess if these measurements could detect early onset of access thrombosis and thus trigger early initiation of interventions to minimize access loss.

METHODS: We identified patients with vascular access thrombosis during 2017 and retrospectively assessed Transonic flow immediately and up to 3 months prior to access clotting. We assessed haemoglobin (Hb), blood pressure (BP) and comorbidities (myocardial infarction, cancer, smoking, diabetes). We compared patients to an age matched control group without access thrombosis. All results are reported as Median (interquartile range) unless specified, and statistical analysis was performed using non-parametric tests.

RESULTS: We identified 14 people with clotted access, and 20 controls. This included 20 with AVGs and 14 with AVFs, 76% (26) were male, median age was 77 (63-82) years. Transonic flows were lower in the group with clotted access both immediately prior (median 615 (380-850) v 1245(875-1465) ml/min, p=0.003) and 3 months prior (median 630 (450-880) v 1160(815-1700) ml/min, p=0.02) to clotting. Hb was higher in those who clotted (11.8 (10.2-13.3) v 10.4(9.5-11.5, p=0.02) g/dl. There was no difference in blood pressure (clotted Systolic BP 131(99-153) v control 143(127-159) mmHg, p=0.4, Diastolic BP 65 (54-81) v 75(66-82) mmHg, p=0.7), comorbidity (all >0.05). A logistic regression model combining transonic flow and Hb demonstrated they were independent predictors of clotted access and were highly discriminative of people who clotted access (ROC AUC 0.88, 95% CI 0.74-1.0).

CONCLUSION: Access flow measurements may offer a useful surveillance tool for detecting an increased risk of access thrombosis in the haemodialysis population. However, there may be other contributory factors which need to be considered in the evaluation of risk of access thrombosis in this patient population.

1. UK Renal Association Guidelines.Vascular Access for Haemodialysis. 2015: Available at http://www.renal.org/guidelines.