To what extent can we avoid starting haemodialysis on a central venous catheter?

Introduction

There is a rising incidence of renal replacement therapy in the UK across all countries, with the current modal group being those on haemodialysis (HD). Patient outcomes in this group are highly dependent on the mode of vascular access used, with strong evidence showing the superiority of arteriovenous fistulas and poor outcomes associated with central venous catheters. Despite this variation there is evidence to suggest that a number of patients begin dialysis on venous catheters due to failure to form timely definitive vascular access. These patients have a poor conversion rate to definitive vascular access, and many are dependent on venous catheters for long term dialysis. Our aim was to review patients at Hull and East Yorkshire renal unit who began HD on a central venous catheter to look for recurring themes that could be remedied.

Methods

This review was comprised of a series of root cause analysis (RCA) on 50 consecutive patients who began HD on a central venous catheter under the care of HEY Renal Unit. Patients were identified by the IT department using the renal database ‘Vital Data’ to create a database of 50 consecutive patients from January 2016 onwards. A retrospective analysis was performed using patient data recorded on all relevant hospital IT systems. Data was gathered on whether patients were crash landers (started HD within 90 days of contact with a nephrologist), the underlying reason for central venous catheter usage as the incident access, and whether this was deemed avoidable. These were grouped into unifying categories to look for repetitive and potentially avoidable themes. For cases in which there was uncertainty a second reviewer was used.

Results

Out of 50 patients, 1 was excluded due to having never had a line, 39 commenced haemodialysis on a line for unavoidable reasons and 10 commenced haemodialysis on a line for avoidable reasons. Those deemed unavoidable mainly consisted of crash landers with previously unknown CKD and patients with non-recovered AKI (with or without a background of CKD). Of those deemed avoidable most were due to human factors, either failure of the medical team to recognise the rate of decline in renal function and refer for access earlier or failure of the patient to engage with the renal department and missed clinic appointments. There were also system failures in which patients weren’t appointed into low clearance clinics or given the timely reviews which were requested.   
It is also worth noting that there was a statistically significant association (p= 0.0084) between diabetic status and starting a dialysis on a line avoidably.

Discussion

These results demonstrate a significant percentage of patients beginning haemodialysis on a line for avoidable reasons. The majority of avoidable lines came as a result of a human error and system failures. Future efforts should focus on improving recognition of patients with rapidly declining renal function and ensuring the correct systems are in place to create access in a timely manner.   
The study period spanned a time of increasing work by our vascular access nurse and surgeons and further analysis of the results show that during this time there was a trend to a falling number of avoidable catheters which is corroborated by improving figures for HEY renal unit for fistula use.

HEY pathology unit are now implementing a CKD alert for general practice and hospital out-patient clinics to identify patients with a trend to declining renal function which may be able to reduce the frequency of previously missed crash landers.