Systematic reporting of extracorporeal blood losses in a large dialysis provider organization

Joachim Beige, Katrin Jüttner, Kati Göbel and Michael Masanneck
Kuratorium for Dialysis and Transplantation, Neu-Isenburg, Germany

Background and Aims: The assessment of adverse safety events is important for the risk assessment of major blood loss from the extracorporeal blood circuit during hemodialysis (HD). Such blood loss has been proven to result in a low double-digit number of fatal events per year in the USA. The frequency in Europe is not mandatorily recorded. The mechanisms of blood loss in the venous leg of the system, undetected by the alarm system of the dialysis machines, are not generally known and further patient and structure-related risks are not yet systematically recorded, evaluated and improved.

Method: We set up a web-based intranet database (“Event Management”) to record serious adverse events affecting patients during or around dialysis treatments in all 174 kidney centers of the Kuratorium für Dialyse und Nierentransplantation in Germany (KfH). This system is accessed via intranet within the KfH organization. Nursing and medical staff are regularly trained and informed about this system. The entry of event data that have endangered or harmed patients is mandatory.

Results: 141 reports of blood loss were identified for a total of approximately 3 million hemodialysis treatments performed in 174 renal centers in between 2020 and 2022, including venous needle loss due to complications in the extracorporeal blood circuit, 15 of which required inpatient treatment. The breakdown of the causes and consequences of blood losses is shown in the Figure.

Conclusion: Venous disconnection must be reduced by earlier detection with appropriate technical and patient-adapted measures. Patients should be educated about their individual risk and about individual measures to manage risk. Identification of patient-specific and shunt-specific risk factors is necessary. Patient-related risk factors include cognitive impairment, frailty, and dialysis in special areas (ICU, isolation area, nocturnal dialysis). Monitoring systems (blood sensors) currently on the market have good technical blood detection sensitivity. Such systems should be investigated with regard to their clinical benefit according to the rules of evidence-based medicine before their broad introduction into routine care.

Figure: