Review of first use of Carpe Diem dialysis machine in Africa for paediatric acute kidney injury

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Abstract

Aims/Purpose: Dialysis in small children for acute kidney injury (AKI) is challenging and in our setting, we practice 'Peritoneal Dialysis (PD) First for paediatric AKI'. In recent years however, advances in technology of both haemodialysis/filtration machines together with small calibre dialysis lines have allowed for haemodiafiltration to be possible. Describe our experience in Cape Town, South Africa with Carpe Diem machine (CArdio Renal PEDIatric Emergency Machine) the first such machine used in Africa.

Methods: Audit of use of Carpe Diem Machine for paediatric AKI June 2019 – 2023 at Red Cross War Memorial Children's Hospital (RCWMCH).

Results:

Carpe Diem Machine use for first time in Africa 2019 – 2023 at RCWMCH	
Number of cases	15
Weight of patients	1.7 – 8kg
Age	2 days – 25months
Diagnosis in cases needing KRT	Open abdomen 5 Post operative cardiac surgery 4 Metabolic conditions 3 Tumour lysis syndrome 1 Iron toxicity 1 Nephrotic syndrome 1
Duration of dialysis	9hours to 6 days
Type of haemodialysis catheter used	Arrow 5Fr 5cm length 12cases Gamcath 6.5Fr 3 cases (1 conversion from 5Fr to 6.5Fr
Size of Carpe Diem circuit used (Surface area in m^2)	$0.15m^2$ 11 cases $0.25m^2$ 3 cases $0.075m^2$ 2 cases
Costs of dialysis per day(excluding machine costs) in Cape Town	KRT Carpe Diem USD 370 KRT Multifiltrate Fresenius USD 195 Acute HD USD 120 Automated cycling PD machine USD 186 Manual PD(Fresenius PD paed set & Cook catheter USD 135 Manual PD improvised using adult CVP line USD 26
Survival	10/15 came off dialysis – 4 cases were withdrawn due to futility and 1 case died while on the machine Later 4/10 died later once off dialysis but due to significant illness Overall, 6/15(40%) survived long term

Conclusions**:** Despite us having a PD First policy, there is a role for the Carpe Diem machine in small infants in countries where it is available or affordable for those patients where PD is not possible (predominantly open abdomen or chests post-surgery). Our survival rate with this device is less than our overall dialysis survival recently published and reflects the challenges in providing KRT in small and critically ill infants.