



TRIUMPH IN TRANSPLANTATION: KIDNEY TRANSPLANTS FROM METHANOL-INTOXICATED DONOR YIELD SUCCESS

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Introduction

The scarcity of organs available for transplantation has prompted the expansion of donor selection criteria to include individuals who have succumbed to toxic substances like methanol. Methanol toxicity can lead to significant or irreversible damage to the central nervous system (CNS) and retina, ultimately resulting in brain death. We reported first-ever successful kidney transplants in Malaysia by utilising organs from a donor with methanol poisoning.

Case Report

The 35-year-old donor, a chronic alcohol consumer, presented in July 2023 with status epilepticus, two days after consuming alcohol purchased from a local convenience store. He was intubated for severe metabolic acidosis, with a lactate level of 13.5mmol/L, creatinine 202mmol/L and serum methanol >80mg/dl. He was treated with fomepizole and one session of hemodialysis. Serial CT imaging revealed methanol-induced cerebral edema. Following treatment, he remained in deep coma and was formally declared brain death. Pre-harvest urine output was 160ml/hour and terminal creatinine of 199mmol/L with a KDPI score of 31%.

Both recipients were induced with IV Thymoglobulin. They did not develop any signs or symptoms of methanol toxicity after transplant.

Recipient 1, a 45-year-old woman with 20 years of dialysis, unknown primary disease, developed left basal ganglia acute haemorrhage secondary to hypertensive emergency with thrombocytopenia of 85k (secondary to thymoglobulin) on day 3 post-transplant. Despite the complications she achieved immediate graft function with serum creatinine of 117mmol/L on day 5 and discharge well on day 18 after intensive rehabilitation. To date, she is ADL independent with minimal residual weakness and her latest creatinine was 107mmol/L after 9 months.

Recipient 2, a 46-year-old man with 16 years of dialysis vintage due to unknown cause, experienced slow graft function due to prolonged cold ischaemic time (CIT) of 22 hours 15 minutes. His Day 5 creatinine was 291mmol/L, decreasing to 160mmol/L at Day 13 and remained stable at 123-140mmol/L thereafter.

Both recipients experienced CMV viraemia and Parvovirus-induced anemia, which were managed with Valganciclovir and IVIG, respectively. Besides these, their transplant journey was deemed smooth, with no significant incidents.

Discussion

Methanol is a highly lethal toxic alcohol which is commonly found in adulterated alcohol and industrial agents. Upon ingestion, it will be metabolised by alcohol dehydrogenase (ADH) into formic acid causing high anion gap metabolic acidosis, neurological and retinal damage, which eventually leads to mortality if left untreated¹. Study has shown that kidneys from donor who died from intoxication are not transmitted to the recipients². Majority of the recipients have good allograft function post transplant.

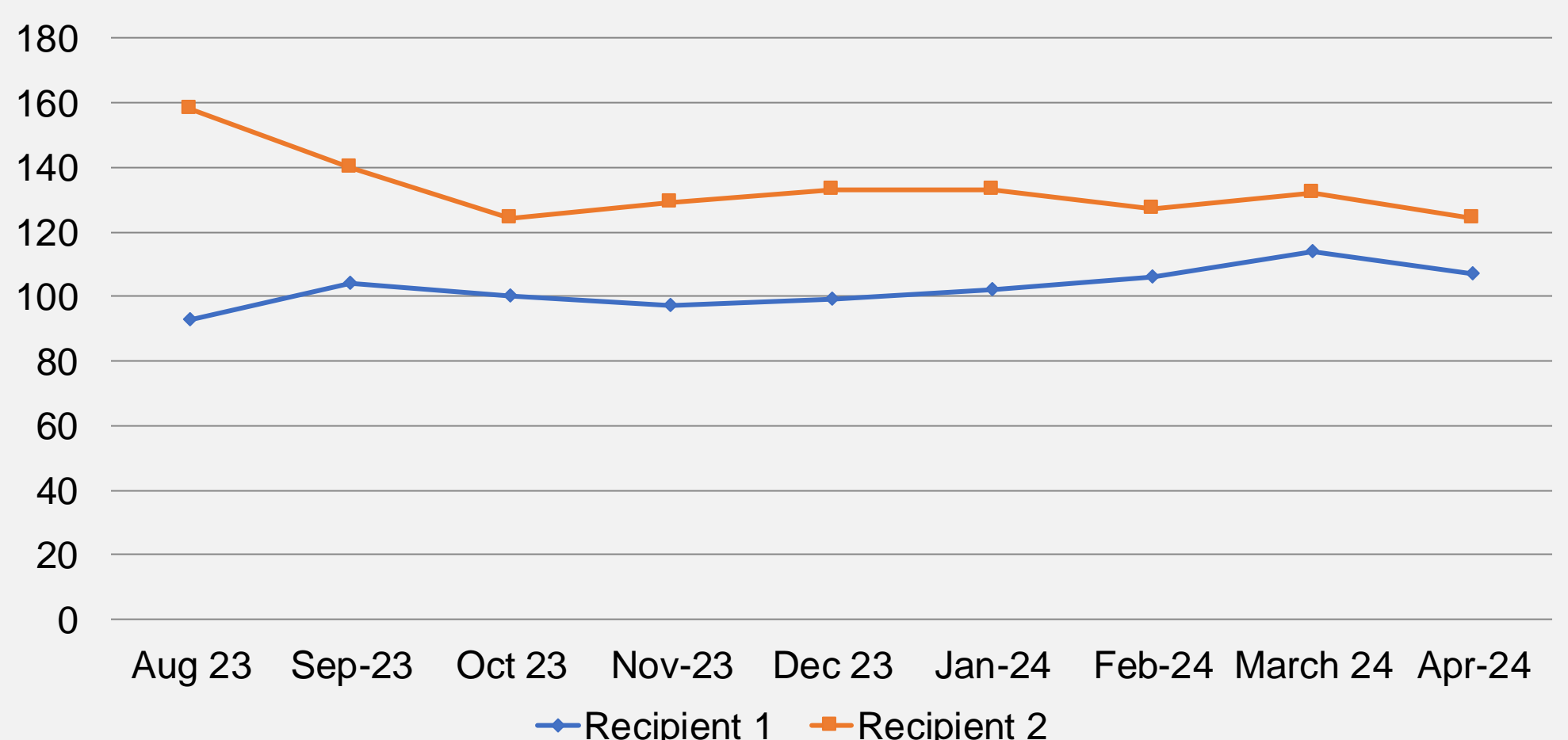


Figure 1: Creatinine trend of recipients post transplant

Conclusion

Transplanting kidneys from methanol-intoxicated donors show successful outcomes, both short and long terms, with no evidence of direct toxicity, advocating for their consideration in transplantation.

Reference:

1. López-Navidad A, Caballero F, González-Segura C, Cabrer C, Frutos MA. Short- and long-term success of organs transplanted from acute methanol poisoned donors. *Clin Transplant*. 2002 Jun;16(3):151-62. doi: 10.1034/j.1399-0012.2002.01109.x. PMID: 12010136.

2. Ashurst JV, Nappe TM. Methanol Toxicity. [Updated 2023 Jun 12]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK482121/>