[ID-P#031] Hydroxocobalamin as rescue therapy for refractory vasoplegia due to severe amlodipine toxicity in a patient on veno-arteriovenous extracorporeal membrane oxygenation (V-AV ECMO)

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Background: Severe amlodipine toxicity can lead to vasoplegia refractory to standard therapies indicated in distributive shock.

Case Report: A 45-year-old man was admitted to ICU with refractory vasoplegia following intentional ingestion of 1300mg of amlodipine. Despite high-dose insulin euglycemic therapy (HIET, ceiling insulin-dose 5units/kg/hr), 1.8microg/Kg/min norepinephrine, 0.04units/min vasopressin, 1mg/kg bolus followed by 1mg/Kg infusion methylthioninium chloride, 650mL 8.4% sodium bicarbonate, 5mg glucagon, 13.7mmol calcium chloride, and 500mL 20% intralipid, he progressed to multiorgan failure with worsening oliguria and metabolic acidosis. Invasive mechanical ventilation and veno-arteriovenous extracorporeal membrane oxygenation (V-AV-ECMO) were instituted on Day-1 for cardiorespiratory failure. However, due to ongoing injuriously high vasopressor requirements and poor response to standard antidotes, an extended duration hydroxocobalamin infusion was used (5g over 3hours). On Day-2, a second infusion was administered (5g over 4hours). Both doses of hydroxocobalamin were temporally associated with significant (>50%) pressor weaning and decrease in lactate concentration. The arterial limb of V-AV ECMO was successfully decannulated after 8days, he had intermittent norepinephrine requirements related to episodes of sepsis from a ventilator- associated pneumonia. 22days post-presentation he remained on veno-venous extracorporeal membrane oxygenation (VV-ECMO) and renal replacement therapy.

Discussion: Amlodipine overdose causes vasoplegia by increasing inducible nitric oxide release and direct antagonism of voltage-dependent L-type calcium channels. Recent reports suggest that HIET use in patients with amlodipine toxicity may increase vasopressor requirements. Methylthioninium chloride has been used successfully in calcium- channel blocker related vasoplegia, but was ineffective here. Intravenous high-dose hydroxocobalamin has an emerging evidence base in vasoplegia management. Its mechanisms of action include inhibition of inducible nitric oxide and hydrogen sulphide via ATP-dependent potassium- channel blockade. In our case, significant reductions in norepinephrine dose occurred during each hydroxocobalamin infusion. Hydroxocobalamin may offer an additional therapeutic mechanism of action to standard therapies in the treatment of refractory vasoplegia in patients with significant amlodipine toxicity.