A CLINICAL CASE REPORT OF A TYPE A DIALYZER REACTION: ANAPHYLACTIC SHOCK TO A HEMODIALYSIS MEMBRANE

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Introduction: Approximately 4 of every 100,000 patients experience dialyzer reactions following the interaction between blood constituents and the hemodialysis membrane. Dialyzer reactions, occurring in 0.004% of patients, are the abnormal sequelae resulting from the interaction between blood constituents and the hemodialysis membrane. Leachable substances may cause these reactions from the dialyzer (e.g. ethylene oxide) or by contamination with bacterial peptides (1). Type A dialyzer reactions occur within the first minutes of dialysis and include symptoms of: itching, burning sensation at the access site, urticaria, flushing, cough, sneezing, wheezing, abdominal cramps, diarrhea, headache, back and chest pain, nausea, vomiting, fever, and chills. More severe reactions result in severe reactions lead to dyspnea, a sense of impending doom, and hypotension, potentially resulting in cardiac arrest and death.

Objectives: (1) Present a rare case of type A dialyzer reactions to a hemodialysis membrane that resulted in anaphylactic shock, cardiac arrest and death. (2) Discuss type A dialyzer reactions and fatal anaphylaxis

Methods: Consent was obtained from the patient’s next of kin. Information was gathered retrospectively through medical records.

Results: In our ICU, we received a 70-year old post-cardiogenic shock male patient who was transferred to us following urgent percutaneous coronary intervention for his left main occlusion and receiving two drug eluding stents in LAD and circumflex. This patient also received an intra-aortic balloon. Right coronary artery was completely occluded. The patient was transferred into our ICU, where his stay was complicated by airway edema resulting in failed extubation requiring steroids, CHF requiring diuresis, rapid atrial fibrillation requiring amiodarone infusion, MRSA pneumia requiring vancomycin, sepsis of unknown origin requiring piperacillin/tazobactam and altered level of consciousness/delirium requiring neurology consult and CT imaging of head which suggested against severe anoxic brain injury. For his difficult ventilator wean, a percutaneous tracheostomy was performed. His other complication included renal failure, which necessitated his transfer to our ICU for potential need of renal replacement therapy. After insertion of temporary hemodialysis catheter, the patient was placed on dialysis machine with Revacler Max 400 membrane. Unfortunately, the patient suffered from recurrent blood clotting on the dialysis membrane precluding effective dialysis. Therefore, the nephrology team decided to switch the membrane to Rexeed polysulfone dialyzer (Asahi). Within minutes of dialysis using the Rexeed polysulfone dialyzer membrane, patient developed bronchospasm followed by hypotension requiring the discontinuation of dialysis. A diagnosis of anaphylactic reaction against the dialysis membrane was made and the use of intravenous epinephrine bolus for blood pressure support was initiated. In addition, corticosteroid, bronchodilators, H1 and H2 receptor blockers were used. Patient initially responded to epinephrine bolus but after a few minutes, patient became hypotensive again. After using 3 boluses of epinephrine, an epinephrine infusion drip was initiated for ongoing blood pressure support as a treatment for prolonged anaphylactic reaction. Unfortunately, the patient went into ventricular tachycardia cardiac arrest,
which necessitated the initiation of advanced cardiopulmonary life support (ACLS) including defibrillation, the administration of epinephrine, magnesium sulphate and sodium bicarbonate. The VT arrest alternated with short run of atrial flutter with slow ventricle response. After 40 minutes of ACLS, the patient was unfortunately pronounced dead.

**Conclusion:** We believe this unfortunate gentleman suffered a rare case of severe anaphylaxis to the access suture and hemodialysis filter, which resulted in hypotension requiring epinephrine infusion. We suspect this patient suffered a myocardial infarction as a result of the epinephrine. Following prompt discontinuation of dialysis and aggressive resuscitation efforts, this patient died. We hope this case report sheds light on dialyzer reactions, anaphylaxis, and management of anaphylaxis in patients with cardiovascular disease.

**References:**