IEQAS Annual Participants' Conference Thursday October 7th 2021

A case of Acute Compartment Syndrome.

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- A case study of Acute Compartment Syndrome

- Male 27 years
- Admitted through A/E on 29/08/21.
- No identification and unconscious. Registered initially as "John Doe."
- Initial ABG : p H = 6.78 (7.35-7.45), BGLac = 16.67 mmol/L (0.36-1.39), K+ = 8.29 mmol/L (3.5-5.0)

- First Biochemistry bloods: CK 50,690 iu/L , Urea 10.9 mmol/L (2.8-8.1), Na+ 141 mmol/L (136-145), K+ 6.8 mmol/L (3.5-5.3), Creatinine 314 umol/L (59-104) Troponin T 462 ng/L (<14). Paracetamol Negative
- Admitted to ICU.

Biochemistry results: (extracts)

Date	CK (iu/L)	CRP (mg/L)	Urea (mmol/L)	Creatinine (umol/L)
29.08.21	50690	11.9	10.9	314
30.08.21	161580	73	11.1	259
30.08.21	337520	204	7.5	214
01.09.21	130550	280	9.8	174
02.09.21	25400	312	8.6	145
03.09.21	13793	301	11.9	183
06.09.21	1515	307	15.7	156
11.09.21	528	197	27.7	254
25.09.21	170	120	21.8	247

CPK (Creatine Phosphokinase)

- Intracellular enzyme present in the Brain and Muscular tissues.
- Any clinical condition that disrupts the cell membrane in these tissues such as injury or lack of oxygen will release CPK.
- Falls and strong exercise will see a rise in CPK.

Common causes of raised CPK

1. Myocardial Infarction. Rises in 3 -12 hours.
2. Rhabdomyolysis. Can be caused by Medicines, Toxins, drug abuse, crush injuries, Electrical injury, Prolonged immobilization, lack of blood supply to a limb.
3. Muscular Dystrophy. Inherited disorder characterised by progressive muscle breakdown over time.
4. Malignant Hyperthermia. Reaction to medication that causes release of calcium and muscle contractions with heat generation.
5. Seizures.

Rhabdomyolysis: Effects.

1. Release of CPK and Myoglobin from affected area. Myoglobin deposits in the kidneys and causes Acute Renal Failure. Manage by Dialysis.
2. Correction of electrolyte imbalance.
3. Correction of metabolic acidosis due to Lactic Acid release.
4. Require fluid hydration.
5. Can be asymptomatic but usually muscular pain/swelling and dark urine.

Compartment Syndrome

- This arises from pressure rises in and around muscles. It limits the blood flow and therefore oxygen and nutrients to the area involved.
- It is most common in the lower leg, but can also occur in feet, arms, hands, abdomen and buttocks.
- Acute compartment syndrome is a medical emergency and can cause permanent damage or paralysis or death.
- Chronic compartment syndrome is less serious and usually caused by intense exercise.

Compartment Syndrome

- A compartment is a group of muscles, nerves and blood vessels covered by a thin firm membrane called a fascia. It keeps the group in place but has limited stretch so can't expand much.
- If there is lack of blood flow to an area then lack of oxygen/nutrients can lead to necrosis of the tissue.
- Acute compartment syndrome requires immediate surgical intervention termed a fasciotomy where an incision is made through the skin and fascia. It then may require skin grafting later.

Case Study Patient:

- Found collapsed amongst needles and drug paraphernalia.
- Very stiff. Nil respiratory initially. Hypotensive and cold peripherally. Naloxone administered by paramedics.
- Intubated in A/E and transferred to ICU and ventilated. Ephedrine and Noradrenaline administered.
- Compartmental Syndrome of right calf muscles, likely from prolonged immobility.

Case Study Patient

- Theatre for fasciotomy to relieve muscle pressure.
- Dialysis for Hyperkalaemia/ lactic Acidosis.
- Prophylactic antibiotics.
- TPN feeding.
- Return to theatre for Above Knee Amputation as situation deteriorated.
- Laparotomy and small bowel resection.
- Multi organ ischaemic injury.

Case Study Patient

- Patient remains in ICU at present.
- I would like to acknowledge the incredible multidiscipline team work involving Paramedics, A/E staff, ICU staff and Medical and Surgical teams and ancillary professions including our own scientists in the laboratory and in NPT.

- Thanks for your time.