

Meningococemia

In intensive care, we have to look at the patient's cardiopulmonary system as a whole rather than looking at individual parameters; it is all too easy to focus on one parameter but miss the big picture.

History

- 2 y/o boy
- Taken to Pediatrician with history of sudden onset of fever, vomiting and lethargy for 4 hours
- Referred to walk-in clinic at hospital

Presentation

- Drowsy and pale, dark rings around eyes
- Temperature 38.7° C
- HR 180 bpm, BP 70/26 mmHg
- Cool peripheries, capillary refill time 5 sec
- RR 54 ipm, dyspnea, cyanosis SaO₂ 100% in oxygen
- GCS 10 then 9, no neck stiffness
- Fine blanching rash on abdomen/chest. Petechial spot on the face
- Transfer to the PICU

Therapy

- Fluid bolus 40 ml/kg
- Epinephrine 0.15 mcg/kg/min

Parameter	Base	Age wise norms
MD (m/min)	12	22-31
SVI (ml/m ²)	30	40-57
SV (ml/kg)	1.2	1.5-2.4
SVV (%)	45	<15
FTc (ms)	278	375-425
HR	180	90-118
SVRI (d.s.cm/m ²)	1120	884-1356
SVR (d.s.cm)	1889	1486-2273
CI (l/min/m ²)	2.8	4.1-5.8
CO (l/min)	2.0	2.5-3.5
Vpk (ms)	0.8	1.2-1.6

Effect of fluid bolus 40 ml/kg and Epinephrine 0.15 mcg/kg/min

- Low stroke volume index
- Low cardiac index
- High heart rate
- High SVV - Hypovolemia and fluid responsive
- Normal systemic vascular resistance index

CASE STUDY

USCOM 1A in Pediatric ICU



60 minutes

- Sedated, mechanical ventilation, afebrile
- HR 180 → 150 bpm
- BP 70/26 → 90/30 mmHg
- Capillary refill time 5 → 3 sec
- Acidosis improved
- SaO₂ 100% in oxygen

Therapy - Fluid bolus 20 ml/kg, Norepinephrine 0.1 mcg/kg/min

Parameter	Base	60min	Age wise norms
MD (m/min)	12	21	22-31
SVI (ml/m ²)	30	50	40-57
SV (ml/kg)	1.2	2.0	1.5-2.4
SVV (%)	45	38	<15
FTc (ms)	278	312	375-425
HR	180	150	90-118
SVRI (d.s.cm/m ²)	1120	690	884-1356
SVR (d.s.cm)	1889	899	1486-2273
CI (l/min/m ²)	2.8	3.8	4.1-5.8
CO (l/min)	2.0	2.6	2.5-3.5
Vpk (ms)	0.8	1.3	1.2-1.6

Effect of fluid bolus 20 ml/kg & Norepinephrine 0.1 mcg/kg/min

- Normal stroke volume index
- Low cardiac index
- High heart rate
- High SVV - Hypovolemia and fluid responsive
- Low systemic vascular resistance index

90 minutes

- Sedated, mechanical ventilation
- Afebrile
- HR 150 → 115 bpm
- BP 90/30 → 100/48 mmHg
- Capillary refill time 3 → < 2 sec
- No acidosis

Therapy - Fluid bolus 20 ml/kg and Norepinephrine 0.2 mcg/kg/min

CASE STUDY

USCOM 1A in Pediatric ICU



Parameter	Base	60min	90min	Age wise norms
MD (m/min)	12	21	32	22-31
SVI (ml/m²)	30	50	58	40-57
SV (ml/kg)	1.2	2.0	2.6	1.5-2.4
SVV (%)	45	38	19	<15
FTc (ms)	278	312	310	375-425
HR	180	150	112	90-118
SVRI	1120	690	897	884-1356
SVR (d.s.cm)	1889	899	1324	1486-2273
CI (l/min/m²)	2.8	3.8	4.6	4.1-5.8
CO (l/min)	2.0	2.6	3.8	2.5-3.5
Vpk (ms)	0.8	1.3	1.5	1.2-1.6

Effect of Fluid bolus 20 ml/kg & Norepinephrine 0.2 mcg/kg/min

- High normal stroke volume index
- Normal cardiac index
- Normal heart rate
- Normal SVV
- Low normal systemic vascular resistance index
- Mild volume deficit and vasodilatation

Summary

Paracetamol and appropriate antibiotics for meningococemia were given within the first hour.

Resuscitation was guided without invasive procedure. The patient's hemodynamics were monitored non-invasively with the USCOM 1A as appropriate treatment was administered confidently and his individual response to the therapy observed and confirmed.