SHOCK

Shock is a progressive deterioration in the micro circulation due to inability of the cardiovascular system to maintain blood pressure and flow. Cells lose oxygen supply, so die and eventually the whole animal dies. Shock is a syndrome- i.e. is multifactorial, there are many causes ranging from blood loss to severe bacterial infecion. The features are: HYPOVOLAEMIA. VASODILATION. MYOCARDIAL FAILURE. ENDOTOXAEMIA

1/Hypovolaemia -decrease in circulating blood volume due to: -Internal haemorrhage -External haemorrhage -Rate of loss is important slow loss can be compensated for. -Mixed water and electrolyte loss - Diarrhoea, vomiting, burns - (Occas primary dehydration)

2/Vasodilation - blood pooling due to loss of smooth muscle tone in arterioles and venules. Seen in drugs, anaphylaxis, some CNS injuries This is a hypovolaemia due to opening out of blood vessels, so made worse by use of vasodilators and pre existing dehydration or blood loss.

3/Myocardial insufficiency - called cardiogenic shock as it is due to heart failure. Unusual in animals, and due to cardiomyopathy, drugs.

4/ Endotoxic shock - chemicals in the cell wall of gram negative bacteria, often these come from intestinal bacteria. Reduce vascular tone and damage capillary endothelium. Physiology of shock NORMAL BLOOD VOL 88ml/kg(dog) 55-65ml/kg (cat) 8-10per cent of body weight is usually used as rule of thumb. Hypovolaemia causes peripheral vasoconstriction - pale and cold skin, poor capillary refill. Reduction in capillary pressure causes fluid to move into circulation to boost the loss of blood volume. Vital area supply, e.g. brain, kidneys is maintained at the expense of the rest of the body. Can compensate for up to 35% loss. 50% loss usu fatal Vasoconstriction causes waste products to build up in the tissues, and hypoxia. Eventually these wastes cause enough dmage to the lining of the blood vessels to alow fluid to leak back into tissues. Fluid then pools and is lost from the circulation, making matters worse. Eventually hypoxia and acidosis reduce heart output. Renal failure develops after 90 mins low blood pressure. Toxic products from intestines enter blood. DEATH OCCURS

TREATMENT

1)*FLUIDS*

Crystalloids Lactated Ringers or 0.9% saline, (or hypertonic saline, a relatively new treatment 7 % saline) 80ml/kg for 1 hour in dog, 50 ml/kg in 1 hour for cat. May overall need 200ml/kg (This equals TWICE the circulating blood volume) Cats are easy to over transfuse, and need a careful watch kept on their breathing to avoid pulmonary oedema. 75% lost from circulation after 30 mins

Colloids Haemaccel / Gelofusine Half life 2-5hrs. Excreted by kidney. Transfuse 20/ml/ kg as these remain in circulation for much longer.

Blood Be careful, dilute by transfusing with a crystalloid/colloid in another vein to help reduce sludging in the circulation.

2)OXYGEN

3)WARM by insulation to avoid severe vasodilation as a response to heat.

4)ANTIBIOTICS

MONITOR: Temperature Pulse Respiration CRT and colour (Beware of pooling causing normal CRT) PCV Blood Pressure Urinary output . Continued anuria = renal failure.