Shock in animals…….63

Shock It's a result of abnormal functioning of the pump or circuit, mechanism or both.

Types and pathogenesis…

Cardiogenic Shock

Cardiogenic shock is caused by inadequate myocardial contractile action from acute myocardial infarction, coronary artery disease, or mechanical factors (valvular regurgitation, low output syndrome, arrhythmias).

In cardiogenic shock, the left ventricle has been injured in some way, leading to impaired pumping.

Because the pumping is ineffective, less blood is pushed out with each heartbeat, leading to a decreased stroke volume. The heart rate increases to compensate for a low cardiac output and blood pressure, but will be insufficient to compensate for the decreased stroke volume. The tissues begin to be inadequately perfused.

Hypovolemic Shock

It occurs when there is a reduction in circulating blood volume due to plasma or free water loss as in case of burns, dehydration, blood loss **(Hemorrhagic shock)**and major tissue damage.

Blood and/or fluids have left the body, causing a decreased amount of volume in the blood vessels. Venous return is decreased because of the lack of fluid in the vascular space, causing decreased ventricular filling. The ventricles do not have as much blood as normal to pump out, so the stroke volume is decreased, The end result of hypovolemic shock is inadequate tissue perfusion.

Neurogenic Shock

Neurogenic shock is caused by the loss of sympathetic control (tone) of resistance vessels, resulting in the massive dilatation of arterioles and venules. Neurogenic shock can be caused by general or spinal anesthesia, spinal cord injury .

In neurogenic shock, there has been an insult to the nervous system so that impulses from the sympathetic nervous system

(the fight or flight response) cannot maintain normal vascular tone or stimulate vasoconstriction.

Anaphylactic Shock

Shock due to severe allergic reaction to substances such as drugs, contrast media, blood products, or insect or animal venom is called anaphylactic shock. Food products such as seafood, nuts, peanuts, peanut butter, can also cause anaphylactic shock.

The immune system become very bad in anaphylactic shock in an extreme allergic reaction. At some point, the individual is exposed to the substance and develops antibodies against it. On subsequent exposure to the substance (the antigen), these antibodies will aggressively bind to the antigen, forming an antigen-antibody complex. This complex causes the release of chemicals that cause vasodilation (in particular, histamine).

Septic Shock

Sepsis is a condition that occurs in many ill patients.

Sepsis is the systemic response to infection. Many types of organisms can cause sepsis, including gram-negative bacteria, gram-positive bacteria, and fungi. The infections can occur anywhere in the body; urinary tract infections are probably the most common cause of sepsis. Septic shock is said to occur when the sepsis has progressed to the point where it is affecting many organ systems The immune and inflammatory response begins to try to combat the organism that is causing an infection. The body releases multiple chemicals into the blood stream, including cytokines,vasodilators, complement factors, and free radicals. In septic shock, this response is not adequate to eliminate the infection and actually causes increased damage. The organism itself also releases substances called endotoxins or exotoxins, which further harm the organs and tissues. The combination of these chemicals and toxins cause: (1) peripheral vasodilation – interstitial edema and decreased blood return to the heart,and (2) decreased ability of the cells and tissues to take up oxygen and nutrients.

Maldistributive shock (vasogenic shock)

Occurs when there is a reduction in circulating blood volume due to increased capillary permeability, and may occur in

Endotoxemia

Neonatal septicemia,

Salmonellosis,

Coliform mastitis in lactating dairy cattle,

Toxic metritis in cattle

Septic shock due to Gram-positive

Too sudden reduction of pressure in a body cavity, e.g. by rapid withdrawal of ascitic fluid.

Obstructive shock

It occurs when there is an acute reduction in venous return due to a mechanical obstruction, such as pericardial tamponade or pulmonary artery thrombosis. Obstructive shock is extremely rare in large animals.

Clinical findings

Depression,

1- weakness accompanied by a fall in temperature to below normal.

2-The skin is become cold.

3-The mucosa are pale gray to white and dry,

4- capillary refill time is extended beyond 3-4 s.

5-There is an increase in heart rate to 120-140 beats/min in horses and cattle, with abnormalities of the pulse including small and weak pressure amplitudes (a'thready' pulse).

6- Cardiac arrhythmias are present terminally and Venous blood pressure is greatly reduced in hypovolemic and hemorrhagic shock and the veins are difficult to raise

7- Arterial blood pressure is decreased terminally and fails to provide an early indicator of the severity of the circulatory failure.

7- Anorexia is usual but thirst may be evident and there is an uria or oliguria

8- Nervous signs include depression, and coma in the terminal stages.