

TREATMENT PROTOCOL IN VENOMOUS SNAKEBITE

- A venomous snakebite is diagnosed from the symptoms suggestive of systemic envenomation.
- Haemostatic abnormalities are prima facie evidence of viperidae bite.
- All viperidae bites can cause renal failure.
- Neurotoxic symptoms like ptosis can also be seen in a Russels viper bite.

SIGNS & SYMPTOMS SUGGESTING A VIPERIDAE BITE-

Local pain, swelling and erythema at the bite site.

- tender enlargement of lymph nodes draining the bitten part this is secondary to larger molecular weight venom fractions entering into the lymphatics
- local necrosis and or blistering
- nausea, vomiting, abdominal pain and abdominal tenderness which suggest a gastro-intestinal or retro-peritoneal bleed.
- hypotension resulting from hypovolemia or direct vasodilatory effects of venom fractions
- low back ache or loin pain which suggest of the likelihood of developing renal failure or a retroperitoneal bleed
- passage of reddish or dark brown colored urine or a reduction in the amount of urine output

- lateralizing neurological signs indicative of an intracranial bleed
- muscle pain indicating rhabdomyolysis
- bilateral parotid enlargement (viper head appearance), conjunctival oedema and subconjunctival haemorrhage
- dysgeusia with a metallic taste
confusional state , ptosis
- jaundice
- the victims could bleed internally from any organ or mucosal surface. Hemoptysis, epistaxis, hematuria, hematemesis & melena, chemosis, macular bleed, excessive menstrual bleed, bleeding from the bite site or cannula, bleeding into the muscles, gingival bleed, bleeding into the skin and mucous membranes showing as purpura or petechia.

INDICATION FOR ADMINISTRATION OF ASV IN HEMOTOXIC BITES –

- 1. Deranged haemostatic profile, suggested by either or all of
- An abnormal WBCT
- PT / APTT above 1.5 times normal

11. a) The presence of a significant local inflammation at the bite site by way of severe pain, swelling and erythema or cyanosis

- b) Tender enlargement of draining lymph nodes
- c) Abdominal pain, Recurrent nausea and vomiting
- d) Acute abdominal tenderness which may suggest gastrointestinal bleeding or retroperitoneal bleeding
- e) Bleeding manifestation - from gums, hemoptysis, epistaxis, hematuria, hematemesis, melena, macular bleed, petechial skin haemorrhage, bleeding from bite site, or cannula.

- 111. BLOOD PARAMETERS
- a) Crenated RBC in peripheral blood smear
- b) Rise in serum creatinine of $>30\%$ of base line value
- c)Proteinuria $>2+$
- d)Raised D dimer value
- e)Low platelet value $<100000/mm^3$

- Patient having features of systemic envenomation, 20 min WBCT prolonged, or the PT/APTT deranged, start with 10 vials of ASV diluted in 100 ml of Normal saline.
- Inj T Toxoid 0.5 ml IM in all bite cases
- Premedications prior to infusion of ASV would include Inj Adrenaline IM
- Victims not given Adrenaline are given a combination of Inj Hydrocortisone 100mg and Pheniramine 25 mg IV
- Start at 10-15 drops/ min for the first 15 minutes, watch for allergic reactions.
- If there is no evidence of reaction to the ASV continue with the ASV at a constant speed such as to finish in 1 hour.
- Continue to monitor the vital signs at 5 mins intervals for the first 30 minutes and then at 15 mins intervals for 2 hours.

REPEAT DOSE IN HEMOTOXIC BITES

- As already mentioned after the initial 10 vials of ASV no additional ASV is given for the next 6 hours as the liver is unable to replace the clotting factors in under 6 hours.
- After 6 hrs the 20 min WBCT is repeated and a repeat dose of ASV is given if there is an abnormality in the clot formation. Another 5-10 vials are repeated over 1 hour depending on the degree of coagulation abnormality.
- The 20 min WBCT is repeated at 6 hourly intervals until coagulation is restored. In the majority of cases of haemotoxic bites a dose of 20 vials of ASV suffices.
- The available polyvalent ASV does not neutralize the venom of the pit viper species- Hump nosed, Malabar and the green pit vipers. Use of ASV is not advocated in Pit viper bites, if the snake is identified as belonging to the pit viper species.

NEUROTOXIC BITES, SIGNS & SYMPTOMS

- Swelling, local necrosis and blistering suggests a cobra bite
Descending paralysis, initially of muscles innervated by cranial nerves, commencing as a ptosis, diplopia or an ophthalmoplegia. The patients complains of a difficulty in focusing and the eyelids feel heavy.
- Dysphagia, dysgeusia (tingling sensation in the tongue with a loss of taste), diaphoresis, circumoral pallor and paresthesia.
- Profound thirst, miosis, abdominal pain, vomiting
- Painful lymphadenopathy
- Palpitation, breathlessness, chest pain

- Paralysis of jaw and tongue may lead to upper airway obstruction and aspiration
- Pooling of salivary secretions as the patient is unable to swallow.
- Bulbar paralysis and respiratory failure
- Hypoxia due to inadequate ventilation can cause cyanosis, altered sensorium and coma. This is a life threatening situation and needs urgent intervention.
- Paradoxical respiration as a result of intercostal muscle paralysis
- Krait bite often presents in the early morning with paralysis that can be mistaken for a stroke

Late Onset Envenoming –

- The patient should be kept under close observation for at least 24 hours. Many species especially the krait and the hump nosed pit viper are known for the length of time that it can take for symptoms to manifest. Often this can take between 6 -12 hours.
- In the case of elapidae bites there may be very little local reaction at the bite site. Local pain develops between 30 minutes. The usual systemic signs and symptoms suggesting envenomation are ptosis, blurring of vision, tinnitus, double vision, difficulty in swallowing etc. The patient may feel sleepy and the head droops. There is slurring of speech and the voice may become indistinct and breathing becomes shallow. Death is usually due to acute respiratory failure.

SEA SNAKE BITES-

- The bite is usually painless and may not be noticed by the swimmer. There is minimal or no local reaction and involvement of local lymph nodes is unusual. Generalised rhabdomyolysis is the dominant effect of envenomation by sea snakes.
- Early symptoms include headache, thirst, a thick feeling of the tongue, sweating and vomiting, generalized aches, stiffness and tenderness of the muscles becomes noticeable between 30 mins to 3 1/2 hours after the bite. Trismus is common. Passive stretching of the muscles is painful. Later there is a progressive flaccid paralysis starting with ptosis as in elapidae bites progressing to respiratory failure. Myoglobinaemia and myoglobinuria develop 3 to 8 hours after the bite. These are suspected when the serum / plasma appears brownish and urine dark reddish coloured (coca-cola coloured). Myoglobin and potassium released from damaged skeletal muscles may cause acute renal failure, while hyperkalemia developing within 6 hours of the bite may precipitate cardiac arrest.
- All species of sea snakes are venomous. Sea snake bites are uncommon

TREATMENT PROTOCOL NEUROTOXIC BITES-

- SIGNS & SYMPTOMS OF NEUROTOXIC BITE WHICH MAY BE USED AS AN INDICATION FOR ASV ADMINISTRATION
- Swelling, necrosis and local pain[cobra]
- Descending Paralysis- Ptosis, diplopia, or ophthalmoplegia
- Respiratory paralysis
- Dysphagia
- Painful regional lymphadenopathy
- Paradoxical respiration resulting from the paralysis of the intercostal muscles

- Treat the case with 10 vials of ASV initially as was mentioned with haemotoxic bites.
- If the Neostigmine test is positive, 0.5 mg of Neostigmine is injected intravenous with 0.6 mg of Atropine intravenous. The same is repeated at half hourly intervals to a total of 5 doses. This is followed up by repeat injections at increasing intervals of 2 to 12 hours.

- Initial dose of 10 vials given and if symptoms persist or worsen or in respiratory failure, repeat 10 more vials of ASV after 1-2 hours as a second dose and discontinue ASV. 20 vials is the maximum dose of ASV that should be given in an elapidae bite victim.
- Once the patient in respiratory failure has received 20 vials of ASV and is supported on a ventilator ASV should be stopped. This is under the assumption that all circulating venom would be either fixed or neutralized by this point. Further doses of ASV do not serve any useful purpose then.

- ASV in children :
- Children should receive the same dose as adults.

LAB TESTS

- Haematological -Hb, PCV,TLC,DC,ESR
- Peripheral smear for crenated red cells, schistocytes,
- platelet count which is repeated at 6 hour interval for the first 24 hours
- Coagulation work up -CT,BT, APTT, PT
- DIC work up - d –Dimer, FDP, fibrinogen which is repeated on Day 3
- Renal function - Urea,creatinine

- Liver function – AST, ALT, ALP, S bilirubin, protein, albumin
- Muscle enzyme – CPK
- Biochemistry – S Na, K⁺, sugars
- Urine checked for protein, haemoglobin, myoglobin
- Blood group and Rh typing at the earliest
- ABG

- Test repeated on a daily basis are
Hb, PCV, Urea, creatinine, platelets, urine-protein
- The coagulation profile normalizes within 24-48 hours of treatment in most cases.

SIGNS SPECIFICALLY LOOKED FOR

- tender regional lymphadenopathy
- swelling of the bitten part
- discolouration of urine
- gangrene / necrosis bitten part
- daily urine output charted out

MANAGEMENT OF PAIN

- T Paracetamol - adult dose 500-1000 mg 6 hourly
- Children 10 mg/kg body weight every 6 hours orally
- Mild opiates like Tramadol / Ketorolac 50mg can be used only for relief of severe pain.

OTHER GENERAL MEASURES

- Fluid preferred is Normal Saline. Dextran to be avoided , Blood grouping to be done prior to infusion of Dextran when given.
- Antibiotic preferred is a combination of Amoxycillin + Na clavunate .
- Handling tourniquets – Though not recommended, the current practice being followed would see many many snake bite victims reaching the emergency with tightly tied tourniquets. Care must be taken when removing tight tourniquets sudden removal can lead to massive surge of venom leading to neurological paralysis, hypotension due to vasodilatation etc.

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