- diagnosis is clinical based on history and examination - strychnine is a glycine agonist that may give rise to a similar clinical picture but muscle tone is usually normal between spasms & urinary strychnine will exclude diagnosis - other differentials include oropharyngeal infections causing trismus, dystonic reactions or psychogenic illness general measures: - tetanus patients should be nursed in a quiet environment & all stimuli should be minimised - prevent further toxin release wounds should be cleaned & debrided & antibiotics should be given airway management: - airway management is a priority in tetanus - generalised muscle spasm. larvngospasm, aspiration or large doses of sedatives may all impair respiration and airway compromise should be anticipated - copious bronchial secretions are seen in tetanus and frequent suctioning is required - metronidazole is the antibiotic of choice although penicillin is used throughout much of the world - penicillin may worsen spasms; however, probably is not associated with higher mortality antitoxin & immunisation: - should be administered to neutralise any unbound toxin (ideally 100-300IU/kg of human immunoglobulin should be administered IM in a single dose; equine antitoxin 500IU/kg can be administered as an alternative but is associated with a higher incidence of anaphylaxis management - tetanus infection does not result in immunity; therefore, all patients should be actively immunised [created with a full primary immunisation course by Paul - consists of supportive care until the effects of bound toxin wear off Young - sedation with benzodiazepines is the standard therapy for tetanus because they inhibit endogenous 23/11/07 antagonists of GABAa receptors and may counteract the effects of tetanus toxin (large doses of 200mg per day or more are often required) - non depolarising muscle relaxants may be required if spasms cannot be controlled with benzos & in this case cardiovascularly inert agents like vecuronium are preferred to pancuronium because of the sympathomimetic side effects of the latter agent - magnesium may be useful in treatment of spasms and may limit autonomic instability. Doses are titrated to a magnesium of 2 to 4 mmol/L. - autonomic instability is often difficult to treat and rapid fluctuations in blood pressure mean short acting - patients with severe tetanus may require 2-3 weeks of IPPV until spasms subside and nosocomial pneumonia is an important complication that often arises in these patients - if the disease is not treated the mortality is >60% and higher in neonates - mortality is 10-25% in units with good facilities - adverse prognostic features include: (i) incubation of <7 days (ii) period of onset <48 hours prognosis (iii) portal of entry from umbillicus, uterus, burns, open fractures or from IM injection (iv) presence of spasms (v) temperature >38.4 (vi) HR >120bpm in adults and >150bpm in neonates

antibiotics:

further management:

agents are preferable

- tetanus is caused by toxin from the bacterium Clostridium tetani & is characterised by muscle rigidity, spasms, & disturbance of the autonomic nervous system - tetanus is caused by a potent neurotoxin from the gram positive bacterium C. tetani which is a ubiquitous organism capable of surviving in the environment as highly resistant spores - once in suitable anaerobic conditions these spores germinate, the bacteria multiply and toxin is released - the most common sources of infection are minor lacerations or the umbillical stump in neonates - toxin is preferentially taken up by motor nerves either locally or after circulation in the bloodstream and then transported retrogradely into the CNS pathophysiology - tetanus toxin is a zinc dependent endopeptidase that cleaves vesicle associated membrane protein II (VAP II) at a single bond. This molecule is essential for synaptic release of neurotransmitters and cleaves disrupts synaptic transmission - the toxin preferentially affects the GABA inhibitory interneurons afferent to the motor nerves in the spinal cord and the brainstem - by preventing inhibitory discharge, unrestricted motor nerve activity occurs, resulting in increased muscle tone and spasms characteristic of tetanus - in severe forms of tetanus the autonomic nervous system is also affected, perhaps as a result of toxin action within the brainstem, giving rise to marked cardiovascular instability - incubation is usually between 4 & 14 days with 90% of cases

presenting within 15 days

general

clinical

features

- initial symptoms include muscle stiffness, with muscle groups with short neuronal pathways affected first; hence trismus and back pain are present in more than 90% of cases on admission

- involvement of the facial and pharyngeal muscles produce the characteristic risus sardonicus and dysphagia
- increased tone in the muscles of the trunk results in opisthotonus
- muscle groups adjacent to the initial site of infection are often particularly severely affected, producing an asymmetrical picture

- the time from the first symptom to the 1st spasm is termed the period of onset. Both the period of onset & incubation period have prognostic significance with shorter times being associated with more severe disease (<48hrs for the period of onset and <7 days for the incubation period)

- spasms may be spontaneous or provoked by physical or emotional stimuli - laryngospasm can occur early in the disease process resulting in acute upper
- airway obstruction
- respiration may also be affected by spasms involving the chest muscles
- muscle spasms are usually most severe during the 1st and 2nd weeks of illness but may persist for 3-4 weeks after which time rigidity may persist for many weeks
- in severe tetanus, autonomic disturbance usually appears during the 2nd week - signs of sympathetic overactivity usually predominate with periods of tachycardia
- & hypertension acute renal failure is a recognised complication of tetanus with dehydration, rhabdomyolysis due to spasms and autonomic disturbance all contributing
- other complications include tendon avulsions, vertebral fractures secondary to muscle spasm, GI bleeding, venous thromboembolism