General Principles

• Nerve agent casualties will present in large numbers soon after the event and may continue to present for days.
• Have a high index of suspicion for
  • mixed agents (e.g. sarin and mustard)
  • secondary injuries (blast, trampling)
• Most casualties will arrive without adequate decontamination.
• Most casualties and their parents will be:
  1. Mildly poisoned and ambulatory and/or
  2. Psychologically traumatized
• Prepare for patient behavioral outbursts, child-care issues, security issues, the media.
• Guard against injury to health care workers from secondary exposure
• Contact appropriate non-medical authorities (e.g. Law Enforcement, Military Public Health) of suspicion of nerve agent exposure.
  • Determine: time of first symptoms, liquid vs. vapor exposure, location of casualties

Differential Diagnosis

• Sudden mass casualties without sign of trauma ➔ suspect airborne toxin
  • Hypoxemic, miosis, profuse secretions ➔ organophosphate (nerve agent/pesticide)
  • Unconscious, metabolic acidosis, non-hypoxemic ➔ Cyanide
  • venous blood gases arterialized
• Progressive respiratory symptoms:
  • Consider: phosgene, anthrax, plague, Botulinum toxin

Clinical Signs

• Children may ONLY show CNS Effects
  • Neuromuscular Effects: twitching, weakness, paralysis, respiratory failure
  • Autonomic Nervous System Effects: reduced vision, small pupil size, drooling, sweating, diarrhea, nausea, abdominal pain, vomiting
  • Central Nervous System Effects: headache, convulsions, coma, respiratory arrest, confusion, slurred speech, respiratory depression
  • Miosis - most consistently indicates a significant exposure
  • RBC-Cholinesterase level is NOT useful to screen for exposure in mass casualty situation

Treatment

• Base treatment on clinical suspicion
  • ABC's: Airway protection and pulmonary support are key for survival
  • Terminate exposure
  • Triage: Attend infants and children in immediate and moderate categories first (higher susceptibilities and more tenuous airways)
  • Decontamination:
    1) Full exposure (bag and seal any clothes or personal items).
    2) Wash with copious water/soap and rinse.
    • Consider 0.05% bleach, flour, talcum, dirt, powder and wash off with water/baby wipes.
  • In a possible liquid exposure to skin or mucous membranes, regardless of findings, observe for 18 hours, at a minimum.
  • Antidotes: see reverse
  • Atropine: Dose liberally to muscarinic effect
    • In the Iran/Iraq War NA severely affected victims received 20-200 mg of atropine.
    • Atropine cannot reverse neuromuscular symptoms
    • Sinus Tachycardia - not an end-point for atropinization
  • Diazepam - other benzodiazepines may be equally effective (consider midazolam or lorazepam).
  • Intubation: consider a nondepolarizing agent

Supportive care:

• Airway protection/bronchospsam/pulmonary toilet
  • Oxygen, bronchodilators, nasogastric tubes.
• Cardiac: Monitor for arrhythmias
• Fluids, electrolytes, nutrition
  • Nursing mothers - discard breast milk
• Prevent hypothermia and hyperthermia
• Eye care
  • Treat eye pain
  • Consider treating miosis
    • Atropine will not reverse miosis
• Treat complicating injuries/infections
  • Attend any iatrogenic skin lesions
• Follow-up: chronic neuropsychiatric sequelae