TETANUS
INTRODUCTION

• Historically called as locked jaw
• Acute often fatal, severe exotoxin-mediated infection-clostridium tetani
• Rosenbach-1886-first time demonstrated these bacilli
• Carlie and Rattone –first described the disease
• Passive immunization used for treatment and prophylaxis during world war one
• Tetanus toxoid first widely used during world war 2
ETIOLOGY

- Clostridium tetani
- Gram positive, anaerobic sporeforming organism
- Terminal Spores- tennis racket type
- Tetanospasmin-neurotoxin
- Tetanospasmin 2nd most powerful toxin after botulinum toxin
• One of the leading cases of death in developing countries

Epidemiology

• Neonatal tetanus-world wide 3,00,000 infant deaths each year

• 80% of deaths in just 12 tropical asian and african countries

• Maternal tetanus -15,000-30,00 unimmunized women die each year
MODE OF TRANSMISSION

- Wound contaminated by tetanus spores
- Pin prick, Animal bite, intrauterine death, ear piercing, tattooing,
- Unsterile cutting of umbilical cord,
- Lack of aseptic care during and after delivery,
- Illicit drug injection
• 2-14 days (may be as long as months after the injury)
• Lesser the incubation period more the mortality
Generalized Tetanus

Clinical Features

- Descending pattern
- Generalized tetanus, trismus is 1st sign
- Headache, irritability, restlessness
- Neck stiffness, locked jaw, dysphasia
- Risus sardonicus face
- Abdominal, lumbar, Hip muscles involved
- Opisthotonous (Bow like) in extension-Rigidity and spasm of back and abdominal muscles
CLINICAL FEATURES – Contd..

• Board like rigidity of abdomen
• Touch sound light exacerbates seizures
• Sensory system totally Normal
• Consciousness well maintained
• Urinary retention
• Paralysis is evident in the 1st week-stabilizes in 2nd week-ameliorates in the next 1 to 4 weeks
• Mainly clinical features are diagnostic
• Proper history, Immunization status
• Other tests are normal
• Clostridium tetani can be isolated from wound only in 1/3rd cases
• Para pharyngeal, Retropharyngeal abscess
• Rabies
• Hypocalcaemia
• Strychnine poisoning
• Acute encephalitis
Wound management

- Washing, debridement of Necrotic material, foreign body removal

Eradication of Cl. tetani

- Penicillin, Metronidazole
- Erythromycin, tetracycline in penicillin allergic patient
# Tetanus Wound Management

<table>
<thead>
<tr>
<th></th>
<th>Clean, minor wounds</th>
<th>All other wounds*</th>
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<tbody>
<tr>
<td><strong>Vaccination History</strong></td>
<td>Tdap or Td†</td>
<td>TIG</td>
</tr>
<tr>
<td>Unknown or fewer than 3 doses</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>3 or more doses</td>
<td>No§</td>
<td>No</td>
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</tbody>
</table>

*Such as, but not limited to, wounds contaminated with dirt, feces, soil, and saliva; puncture wounds; avulsions; and wounds resulting from missiles, crushing, burns, and frostbite.

†Tdap is preferred to Td for adults who have never received Tdap. Single antigen tetanus toxoid (TT) is no longer available in the United States.

§Yes, if more than ten years since the last tetanus toxoid-containing vaccine dose.

¶Yes, if more than five years since the last tetanus toxoid-containing vaccine dose.
• Human anti tetanus immunoglobulin long $T \frac{1}{2}$ 30 days allergy absent

• Equine or horse ATS $T \frac{1}{2}$ 10 days allergy present
• Diazepam sedation
• Dark environment
• Minimal sound & touch
• Endotrachcal intubation may be required for assisted ventilation & to prevent aspiration
• Cardio respiratory monitoring
• Maintain airway
• Maintain fluid, electrolyte, calorie requirement
• Aspiration pneumonitis
• Laryngeal spasm, apnea
• Mouth, tongue laceration
• Rhabdomyolysis, Myoglobinuria, renal failure
• Spinal fracture
By tetanus toxoid

- Protective level of antitoxin 0.01Iu /ml
- Two types of vaccine available

Combined vaccine- DPT

- Routinely used in Universal immunization programme
- Contain diphtheria toxoid tetanus toxoid, killed pertussis organism. Given in 5 doses
World immunization coverage

- Diphtheria-tet... 86%
- Polio 86%
- Measles 85%
- Hepatitis B 82%
- Pneumococcal 31%
- Rotaviruses 19%
Human tetanus hyper immunoglobulin
• Best for prophylaxis
• Gives protection for 30 days

Equine anti tetanus serum
• Protect for 8-10 days
• Serum sickness, anaphylaxis, allergy common
Combined active &amp;
• Also called as 8th day disease **TETANUS NEONATORUM**
• Rare before 2 days & after 2 weeks
• **C/F:** Excessive cry, refusal to feed apathy, mouth slightly kept open due to pull of neck muscles
• Opisthotonus in extension
• Constipation, Apnea
• Touch provoked seizure
IN INDIA DISTRICTS CLASSIFIED FOR NEONATAL TETANUS AS

**NT high risk**
- Rate > 1/1000 live birth
- TT coverage < 70%
- Attended deliveries < 50%

**NT Control**
- Rate < 1/1000 live birth
- TT coverage >70%
- Attended deliveries >50%
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• Unsterile cutting of cord
• Applying cow dung on cord
• Unclean delivery surface
• Antibiotic penicillin & Erythromycin
  **TREATMENT SAME AS ADULT TETANUS**
• Diazepam sedation & muscle relaxation
• Intensive supportive care
• Avoid light, sound, touch
• Clean delivery practice

• “5 cleans” - clean hands, clean delivery surface, clean cord, clean thread & clean blade

• 2 dose of TT to unimmunized mother between 16-36 weeks of gestation

• Minimum 4-6 weeks gap between 2 doses

• Infant born to unimmunized mother give human antitetanus immunoglobulin within 6 hours after birth
• 40-80% mortality in diseased

**PROGNOSIS**

Good prognostic signs

• Early diagnosis, long incubation period, absence of fever

• Hypoxic brain injury can lead to cerebral palsy

• Cephalic tetanus poor prognosis

• Otogenic tetanus better prognosis