

TETANUS

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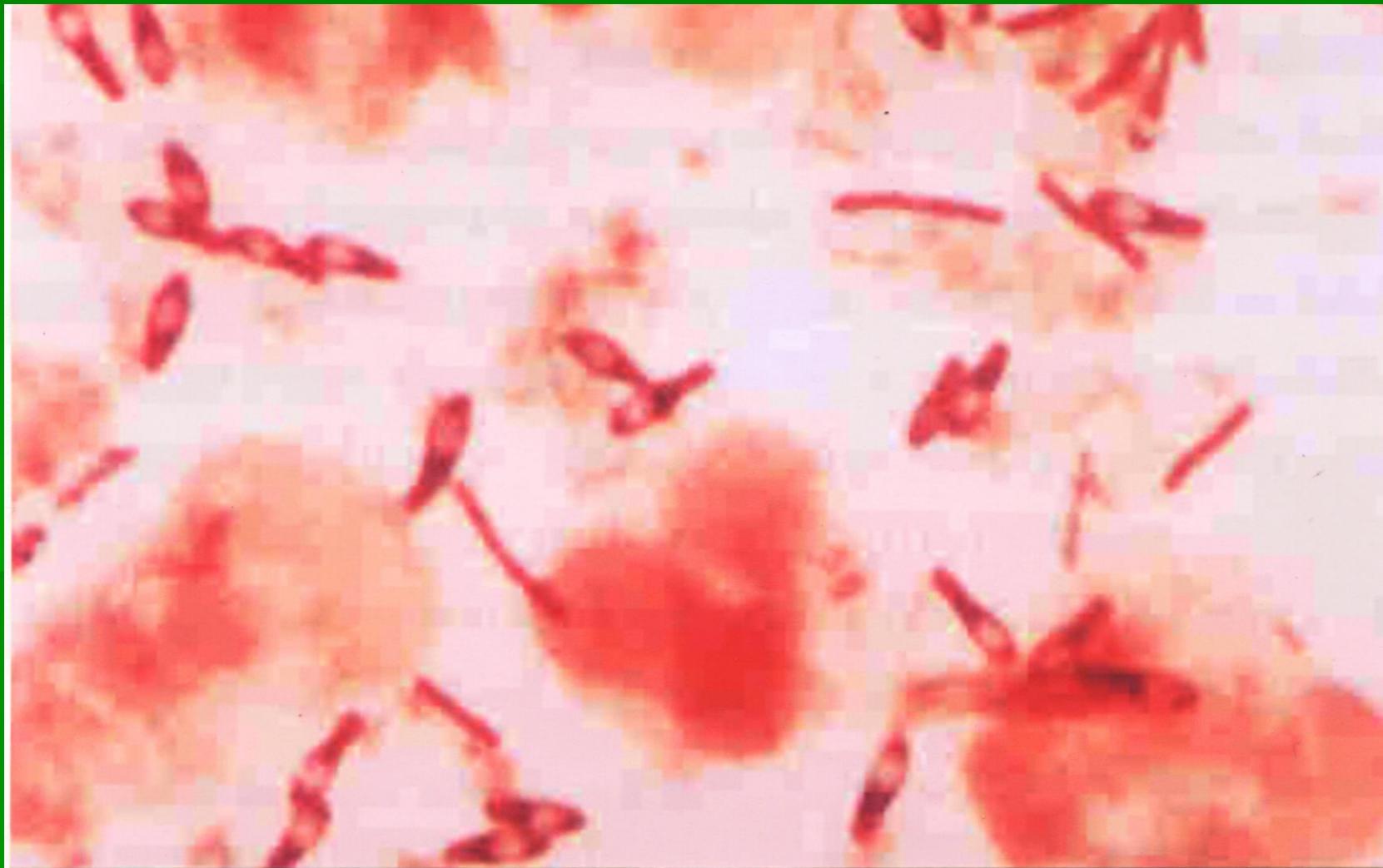
MD FRCA

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Faculty of Medicine

Infection affecting the nervous system

- Organism Clostridium Tetani
- Anaerobic gram positive bacillus
- Spore bearing
- Spores exist in soil, animal and human faeces.
- Requires an Anaerobic environment to proliferate



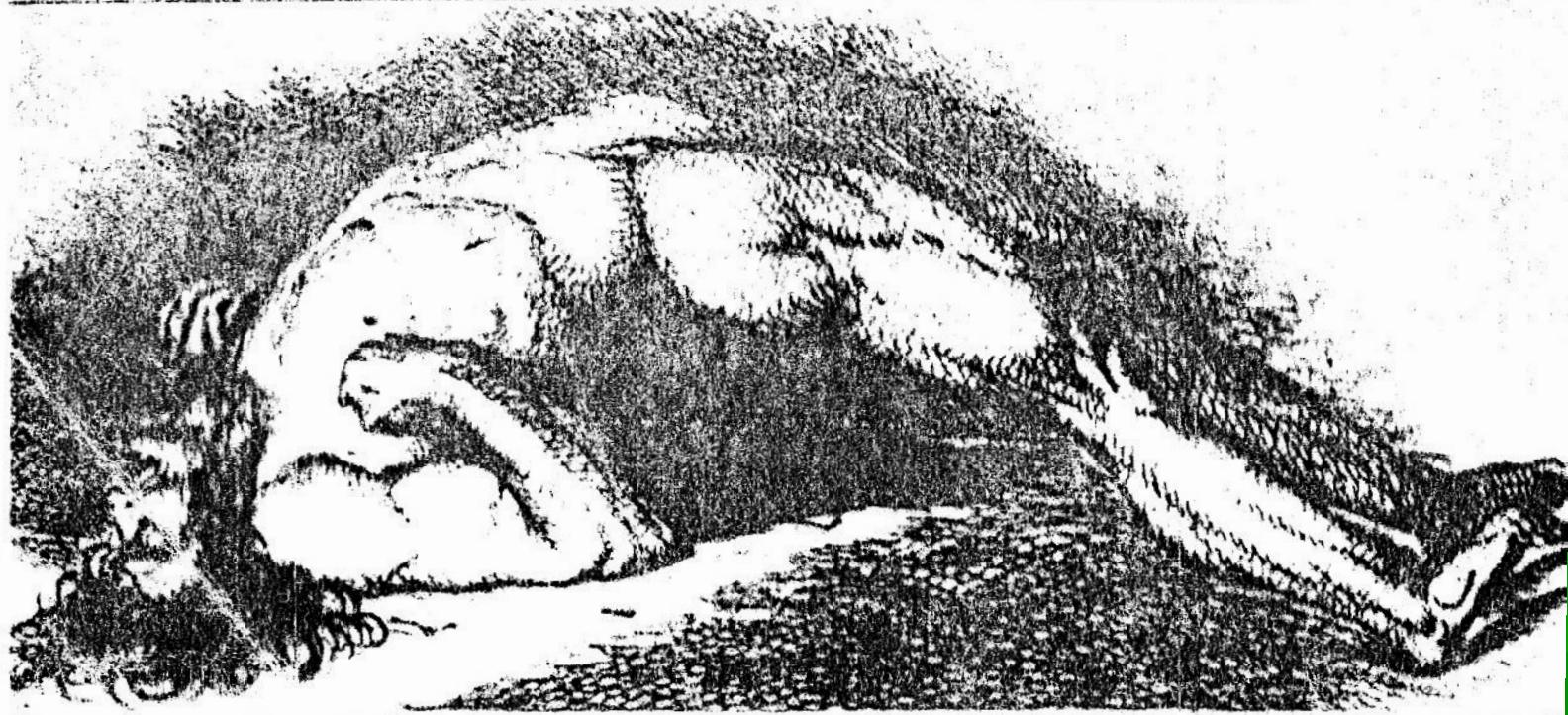
Pathogenesis

- The spores proliferate in
 - Deep wounds that are not exposed to air (O₂)
 - Puncture wound or laceration
 - Devitalized tissue
 - Burns, Gangrene, surgery, abortion, dog bites, dental infection
 - *Tetanus neonatorum* (umbilical stump)
In 20% of cases no entry site can be found
- They produce two exotoxins
 - Tetanospasmin
 - Tetanolysin

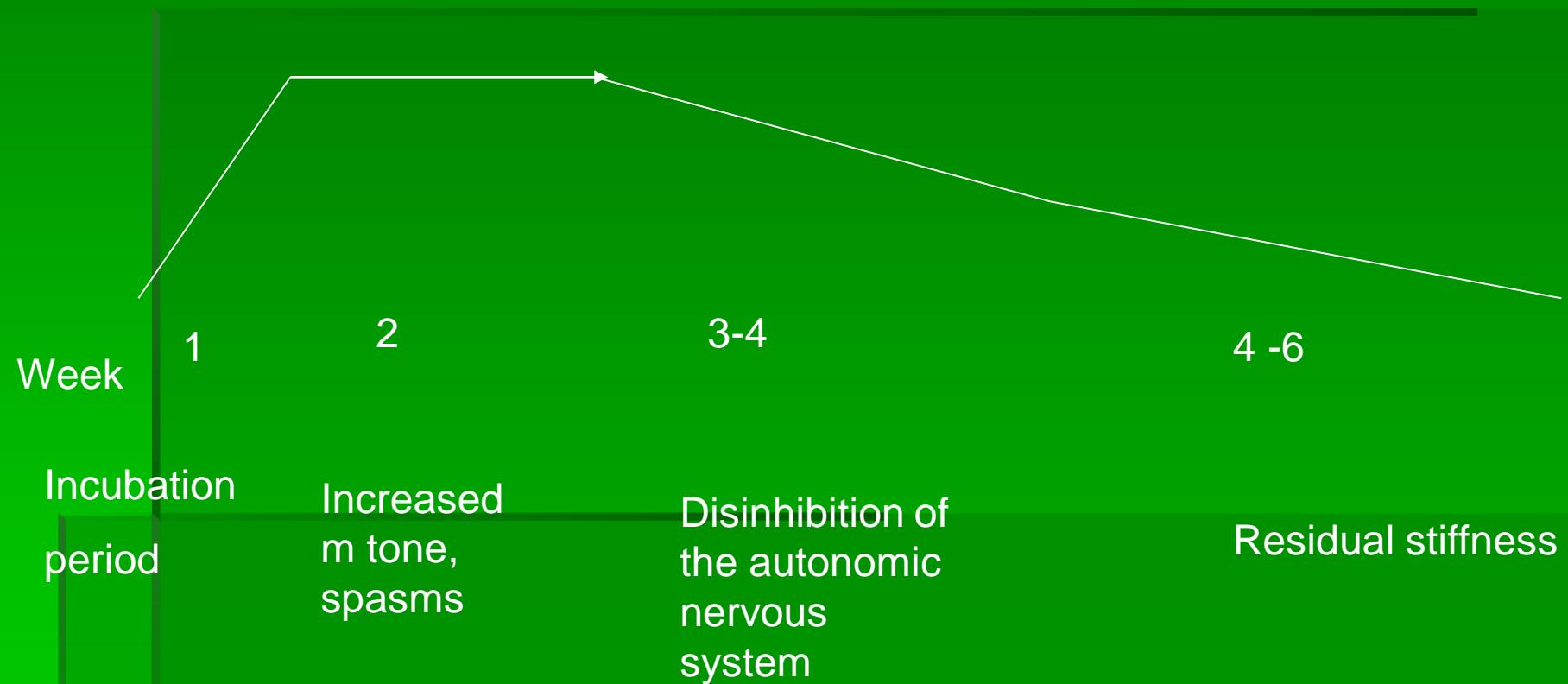
Effect of Tetanospasmin

- Enters the motor neurone
- Retrograde transport to reach the spinal cord
- Inhibits the inhibitory pathways
- Exaggeration of spinal reflexes
- Manifests in the motor and the Autonomic system
 - General muscle rigidity and muscle spasm
 - Excessive sympathetic activity

Fig. 2. Severe tetanus.



Natural History of Tetanus



- Incubation period
- Onset time – time between the appearance of increased muscle tone and the onset of spasms

- Increased tone
 - Muscle stiffness - hypertonia
 - Pain - trismus (lockjaw)
 - Dysphagia
- Risus sardonicus (spasm of the facial muscles)
- Opisthotonus (spasm of paravertebral muscles)

- Spasms
 - Spontaneous
 - External stimuli (light, noise, movement)
 - Autonomic symptoms
 - Fluctuating hypertension
 - Tachycardia
 - Sweating
 - Pyrexia
 - Profuse bronchial and salivary secretions
- Rarely hypotension and bradycardia

Grades of Tetanus

- Grade 1 (mild) – mild to mod trismus with localized or generalized rigidity
- Grade 2 (mod) – Moderate trismus and rigidity with fleeting spasms
- Grade 3a – Severe trismus with severe prolonged spasms and resp difficulty
- Grade 3b – Same as 3a with autonomic instability

- Because spasms and rigidity can lead to respiratory distress and exhaustion these patients should be managed in hospitals that have ICU facilities

So

- Tetanus is a preventable often Third world disease that frequently requires First world technology to treat.

Factors associated with poor outcome

- Extremes of age
- Short incubation period
- Short onset time
- Fever on admission
- Tachycardia on admission
- Severe spasms
- Puerperal, postsurgery, burns



Fig. 2 Acute tetanus. Prognosis is worst at the extremes of age.

Prevention

- Immunization

- DPT
 - DT (5 years)
 - Tetanus toxoid boosters every 10 years
 - Pregnancy
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Diagnosis

- Clinical
 - Organism cannot usually be isolated
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Priorities of Management

- Eradication of the organism
 - Wound toilet
 - Antibiotics Metronidazole (7 – 10 days)
- Neutralize the toxin
 - Passive immunization (tetanus immunoglobulin - equine or human)
 - Booster dose of tetanus toxoid
- Maintenance of Airway and ventilation
- Supportive
- Prevent and Treat complications

- Mild to Mod
 - Avoid disturbances (no oral fluids or NG tubes)
 - Sedation
 - Monitoring
- Severe
 - Sedation
 - Tracheostomy
 - Hydration and Nutrition
 - Treat autonomic disturbances

Clinical diagnosis of Tetanus

Secure the airway
(Tracheostomy)

Sedation – Benzodiazepines

Antitoxin

Antibiotics- Metronidazole

Control auton.
dysfunction

Control muscle spasm – Benzodiazepine,
magnesium, Baclofen, Dantrolene

Supportive – Hydration, Nutrition, Physiotherapy, DVT prophylaxis

Epidemiology

- Occurs in the unvaccinated
- Therefore in countries and areas where the primary health care is poor
- Mainly the developing world
- Notifiable disease

THANK YOU
