Trachoma

A specific communicable keratoconjunctivitis usually of chronic evolution caused by the chlamydia trachomatis, primarily affecting the superficial epithelium, characterized by formation of follicles, papillary hyperplasia and pannus, the natural reolution of which is by cicatrization involving potentially considerable visual disability. (Duke-Elder)

It means rough (Greek)

Epidemiology

Worldwide

500 million affected
2 million are blind
15.5 % of global blindness

Nepal

6.5 % (1 million) of population affected
2.4 % of blindness
commonest in western and far western terai (Bheri & Seti zone) Chettry, Magar & Tharu

Disease Characteristics

Poverty, dirt, flies, poor sanitation, etc.
F > M
Transmission by direct inoculation by finger, flies and fomites.
Prevalence a fly population in a region
Incubation period is 5 – 12 days
Age commonest in childhood
Reservoir of infection children with active disease

Clamydia trachomatis

A, B, Ba & C ® Trachoma (commonest is C)
D – K ® Inclusion conjunctivitis
L1, L2 & L3 ® Lymphogranuloma venereum
Elementary body (300 nm, don't divide, infectious) ® Reticulate body (1000 nm, divide, non-infectious) ® intracytoplasmic inclusion body (Halberstaedter – von Prowazek)

Pathology

Primary epithelial lesion of conjunctiva and cornea
Chronic inflammation characterized by papillary hypertrophy of epithelium and lymphoid infiltration of subepithelial tissue.

Follicle
- Mass of mononuclear cells surrounded by phagocytes, giant phagocytes (Leber's cells), polymorphs, mast cells and eosinophils.
- May be large (upto 5 mm)
- Central necrosis ® mature (Sago grain) ® cicatrization
- Many follicles may coalesce ® Folliculoma of Pascheff

Papillae
- Epithelium undergoes hypertrophy and is thrown in folds to form papillae.
- Between adjacent papillae pseudoglands may form ® retention cysts and concretions

Pannus
- Subepithelial infiltration and vascularization of peripheral cornea contiguous with the limbus first between epithelium and the Bowman's membrane followed by destruction of the latter.

Other changes
- Increased Goblet cells
- Cellular infiltration of tarsus ® thickening ® degeneration ® softening
- Lacrimal gland infiltration
- Infiltration of lacrimal sac and dacryolith formation
- Decrease Tear lysozyme
- Increase C3 & Factor B in tears and corresponding decrease in serum.

Clinical Features

Conjunctiva
- Congestion, irritation, watering, discharge & photophobia
- Follicles gray white nodule with surrounding blood vessels
- uppper trasal conjunctiva
- Upper fornix
- less commonly in the lower fornix, plica & bubar conjunctiva
- Papillary Hyperplasia of epithelium each with a central twig of vessel give rise to a velvety appearance of conjunctiva
- formation of concretions
- Scarring
- Stellate
- Mosaic pattern
- Arlt's line

Cornea
- Follicles at limbus (Herbert's follicles)
- surrounded by vessels (Herbert;s rossettes)
- Pannus
- Progressive: infiltration extends beyond vascularisation
- Regressive: vascularisation extends beyond infiltration

Types of Trachomatous Pannus

- Pannus tenuis: recent and thin
- Pannus vasculosus: highly vascular
- Pannus crassus: thick & fleshy
- Pannus ciccus: cicatricial

Other types of Pannus

- Pannus trachomaous
- Pannus leprosus (leprosy)
- Pannus scrofulous (phlyctenular conjunctivitis)
- Pannus degenerativus (atrophic bulbi, glaucoma, etc.)

Superficial keratitis & punctate epithelial defects
Herbert's pits: scarring of limbal folicales initially gives rise to a depressed scar which later fills up and gets pigmented
Opacification of cornea

Classification of Trachoma

McCallan (1908)

Stage I Incipient Trachoma (Infiltration)

Immature follicles on upper tarsus
Minimal papillary hypertrophy
Faint subepithelial opacities with diffuse punctate keratitis
Early pannus

Stage II Established Trachoma (Florid infiltration)

Ia Follicular Hypertrophy Predominant

Mature well defined sago grain follicles
Advanced keratitis
Limbal follicles
Advanced pannus with subepithelial infiltration and corneal haze

IIb Papillary Hypertrophy Predominant

Papillary hypertrophy obliterating the follicles
Intense cellular infiltration
Pannus & infiltration of upper limbus
Necrosis of follicles at limbus and tarsus

Stage III Cicatrising Trachoma (Scarring)

Follicular necrosis & scarring with island of follicles & papillae inbetween
Beginning of entropion and trichiasis
Gross pannus
Usually denotes re-infection

Stage IV Healed Trachoma (Sequelae)

Tarsal conjunctiva completely scarred but pattern smooth, mosaic or Arlt's line
Cornea free of infiltrates anmd staining
Sequelae

WHO Classification (1987)

Meant to be used by field workers
TF Trachomatous Inflammation Follicular
> 5 folicles (> 0.5 mm diameter) on upper tarsal conjunctiva
TI Trachomatous Inflammation Intense
inflammation & papillary hypertrophy obscurring > ½ of tarsal vessels
TT Trachomatous Trichiasis
at least 1 trichiatic cilia rubbing on theglobe or evidence of its recent removal

TS Trachomatous Scarring
obvious trachomatous scarring of upper tarsal conjunctiva
CO Corneal Opacity
Trachomatous corneal opacity at least a part of which extends over the pupil
Diagnostic Criteria

At least 2 of following:

1. Follicles on upper tarsal conjunctiva
2. Limbal follicles or Herbert's pits
3. Typical conjunctival scarring
4. Vascular pannus most marked in the superior limbus

Sequelae

1. Distortion of lids
2. Entropion
3. Trichiasis
4. Ectropion (hypertrophy of conjunctiva)
5. Herbert's pits
6. Ptosis (tylosis & infiltration of LPS)
7. Madarosis
8. Posterior symblepharon
9. Parenchymatous xerosis
10. Defective lid closure, lid deformity & deficient tear film ® corneal damage.
11. Cicatrization involving lacrimal drainage & dacryolith formation ® epiphora
12. Glaucoma (perilimbal fibrosis & infiltration of the outflow channels)

Secondary Infection

H. aegyptius (commonest)

Complications

1. Corneal ulcer
2. Iritis

Differential Diagnosis

1. Folliculosis
2. Toxic follicular conjunctivitis: Molluscum contagiosum, Topical drugs,Eye cosmetics
3. Bacterial e.g. Moraxella
4. Axenfeld's Follicular Conjunctivitis
5. Chronic follicular Conjunctivitis
6. Perinaud's Oculoglandular Syndrome
7. Vernal Conjunctivitis

Laboratory Diagnosis

Detection of HP bodies on smear
1. Iodine stain
2. Giemsa stain
3. Immunoflourescent stain
4. Cytology

Isolation of Chlamydia
1. Yolk sac culture
2. Tissue culture on irradiated McCoy Type II cells

Serology
1. Complement fixation test
2. Immunodiffusion Assay
3. Radioisotope Assay
4. Microimmunoflourescence
5. ELISA
6. Serial Radial Hemolysis

Cutaneous Hypersensitivity

Treatment

Historical
1. Copper Sulphate
2. Silver Nitrate
3. Gonoccocal pus
4. Scarification
5. Lid Excision

Current

Topical
Oint. Tetracycline 1 % 2-4 times/day for 6 weeks
Oint. Erythromycin 1 % 2-4 times/day for 6 weeks
G. Sulphacetamide 20 % QID for 6 weeks

Systemic
Tetracycline 250 mg QID PO for 3-4 weeks
Erythromycin 250 mg QID PO for 3-4 weeks
Doxycycline 250 mg BD PO for 3-4 weeks
Azithromycin 20 mg / kg body weight single dose

Surgical Treatment
Concretions are removed with hypodermic needle
Trichiasis is dealt with by epilation, electrolysis or cryotherapy
Entropion by appropriate operation
Mild to Moderate: Wedge resection of tarsus (Fox's modification of Streatfield – Snellen's Operation)
Moderate to Severe: Tarsal Fracture (Ballen's modification of Burrow's operation)

Prophylaxsis

Mass or Blanket Therapy

Criteria

Prevalence > 5 % in children < 10 years of moderate to severe trachoma

Schedule

Ointment Tetracycline OD for 10 days or BD for 5 days, every month for 6 months.

Public health Measures

Water supply to promote general hygiene
Better sanitation
Controlling fly population
Health & hygiene education of school children

Vaccine

Major Outer Membrane Protein (MOMP) Vaccine (under investigation)