



Lecture (5)

CEREBRAL TB AND OTHER  
CHRONIC  
CEREBRAL INFECTIONS



Color  
guide:

- Very important
- Additional information
- Male doctor's notes
- Female doctor's notes

Lecture (5)

# CEREBRAL TB AND OTHER CHRONIC CEREBRAL INFECTIONS

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MICROBIOLOGY  
TEAM 432



Objectives:

**Not given !!!**



# Mind map

(CEREBRAL TB AND OTHER CHRONIC  
CEREBRAL INFECTIONS)

Cerebral TB and  
other chronic  
diseases

Bacterial  
(*TB, brucellosis*)

Fungal  
(*Cryptococcus  
neoformans*)

Viral  
(*HIV*)

Paracitic  
(*Toxoplasma  
gonodii*)

## General signs and symptoms for chronic cerebral infections:

### SYMPTOMS

- ❖ Chronic head ache
- ❖ Neck or back pain
- ❖ Change in personality
- ❖ Facial weakness
- ❖ Double vision ,visual loss
- ❖ Arm and leg weakness
- ❖ clumsiness

### SIGNS

- ❖ +/-Papilloedema
- ❖ Brud Zinc or Kerning 'positive sign sof meningeal irritation
- ❖ Altered mental status, memory loss, etc
- ❖ Seventh nerve palsy
- ❖ 3,4,6 th,Nerve palsy
- ❖ Ataxia
- ❖ Hydrocephalus

# Microbiological Causes Of Chronic Cerebral Infection And Meningitis:

Bacterial, Most important	Fungal Causes	Parasitic	Viruses
<p>A. <u>Tuberculosis</u> } <u>“most common in Saudi Arabia”</u></p> <p>B. <u>Brucellosis</u> }</p> <p>C. Partially treated acute meningitis</p> <p>D. Syphilis-caused by Treponema Pallidum</p> <p>E. Liptospirosis- caused by L.Icter haemorrhagia</p> <p>F. Lyme disease-caused by Borrelia burgdorferi[ not common in Saudi Arabia]</p> <p>G. Nocardiosis-caused by Nocardia speciese.g N.Asteroids “immunocompromised pt”</p> <p>H. Cerebral abscesses can also same present as chronic infection</p>	<p>a- Cryptococcus neoforman (with indian ink of CSF gives capsultesd ike rbc)</p> <p>In AIDS pt</p> <p>b-Candida species in Saudi Arabia mainly Candida albicans in immunocompromised patients</p> <p>c- Aspergillus species</p> <p>d- Histoplasma capsulatum</p>	<p>❖ Toxoplasma gonodii(most common)</p> <p>In AIDS pt</p> <p>❖ Trypanosoiasis: caused by T.gambiense</p> <p>❖ Rare causes Acanthamoeba sp(swimming pools)</p>	<p><b>Some virus can some time present as chronic meningitis these include:</b></p> <p>❖ a- Mumps</p> <p>❖ b-<b>Herpes simplex</b></p> <p>❖ c- HIV</p>

***The most important causes of chronic bacterial cerebral and meningeal infections in saudi Arabia are : 1- Tuberculosis 2- Brucellosis***

infection	TB	Brucellosis
organism	<b>Mycobacterium tuberculosis</b>	<b>Br.melitensis</b>
Transmitted by	Inhalation (air saw)	From <b>animala</b> ( Zoonotic) <b>consuming raw milk and milk products</b>
symptoms	Chronic headache, neck pain, Prolonged fever, chest pain, hemoptysis	Chronic headache, neck pain, <b>Pyrexia( fever)&lt; 3weeks</b> , night sweating, malaise
Imaging	<b>x-ray</b> tuberculoma formation	Don't need to
Lab investigation	<b>CSF (concentrated *10), AFB, PCR</b>	CSF culture, serology,PCR
In hospital	Isolate patients	Don't have to isolate patients
treatment	1-Rifampicin 2- Isonized(INH) 3- Ethambutol 4-Pyrazinamide } for 2months  Then, Rifampicin INH } for 4-6months	a- tetracyclin b- Rifampicin c- Cotrimoxazole

## Diagnosis of chronic cerebral and meningeal infections:

### 1- History taking

### 2- clinical examination

- For symptoms and signs

### 3- imaging

- X-ray(TB), MRI, ultrasound

### 4-lab investigations

- 2-3ml of CSF:
  - ❖ Bio chemical for : 1- Total protein(↑)2- Glucose level in comparison to the serum glucose level ( $> 2/3$ )
  - ❖ Microscopy: 1- Presence of organism 2- WBC(↑)3- Differential count mainly for: a- Polymorphes(acute) b- **Lymphocytes**(chronic)
  - ❖ **Serology** and VDRL for syphilis, **Brucella**
  - ❖ India ink for **Cryptococcus neoforman**
  - ❖ **Culture for Brucella and T.B**
  - ❖ Wet preparation of CSF for fungal and parasites
  - ❖ **Z-N Stain can show AFB of T.B while modified Z-N can show Nocardia**

## treatment

### Tuberculosis

4 Drugs are used these are:-

- 1- Rifampicin
  - 2- Isonized(INH)
  - 3- Ethambutol
  - 4-Pyrazinamide
- } for 2 month

Then,

- Rifampicin
  - INH
- } for 4-6 months

### Brucellosis

Two of the following 3 drugs:

- a- Tetracycline    b- Rifampicin    c- Cotrimoxazole

Usually Rifampicin and Cotrimoxazole are preferred as they have good penetration power in the BBB.



## Summary (important)

infection	TB	Brucellosis
organism	<b>Mycobacterium tuberculosis</b>	<b>Br.melitensis</b>
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treatment	<p>1-Rifampicin 2- Isonized(INH 3- Ethambutol 4-Pyrazinamide</p> <p>} for 2months</p> <p>Then, Rifampicin INH</p> <p>} for 4-6months</p>	<p>a- tetracyclin b- Rifampicin c- Cotrimoxazole</p>

## summary

- **Pott's spine "type of CNS tuberculosis" can present with only one symptom which is back pain.**
- **India ink for Cryptococcus neoforman.**
- **Chronic infections have a slow insidious onset, and They are usually diagnosed ,if the neurological syndrome exists for > 4 weeks.**
- **TB and brucellosis are always misdiagnosed, so we have to be careful with treatment to avoid side effects and liver toxicity.**
- **Rifampicin is used for both TB and brucellosis**
- **Tuberculosis and Brucellosis are very common in Saudi Arabia, and They should be differentiated on the basis of:**
  - a- Clinical History**
  - b- Occupation**
  - c- Clinical symptoms**
  - d- Clinical signs in other organs e.g; chest in TB**
  - e- Cerebrospinal fluid findings**

## Questions

**Q1: A drug that is used to treat both Tuberculosis and Brucellosis:**

- A. Isoniazid
- B. Ethambutol
- C. Pyrazinamide
- D. D-Tetracyclin
- E. Rifampicin
- F. Cotrimoxazole

**Q2: 65 years old Patient presents with fever, night sweats, weight loss over the last 4-5 months. The doctor performed lumbar puncture. Findings are: lymphocytosis and AFB smear is positive. Most likely organism is:**

- A. Mycobacterium tuberculosis
- B. HIV
- C. Cryptococcus neoformans
- D. Brucella Melitensis

**Q3: patient in previous case is treated with drugs for at least:**

- A. 3 months
- B. 6 months
- C. 9 months
- D. 12 months

**Q4: HIV patient present with headache and neck rigidity. Capsulated organisms are seen in india ink.**

**Most likely organism is:**

- A. Mycobacterium tuberculosis
- B. HIV
- C. Cryptococcus neoformans
- D. Brucella Melitensis

Qs	Answer
1	E
2	A
3	C
4	C



*For any problems and suggestions please contact:*

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*Thank you*