Cerebral Toxoplasmosis in HIV patients. Two presentations.

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CDC Greys
Patient 1

- Personal history Pleural and Abdominal Tb, still on treatment at the time of consult.
- Cd4 30 January 2006.
- Viral load 280 000 copies/ml.
- Present complaint involuntary movements starting left hand side and progressively affecting rest of the body impeding normal gait and speech, noted 2 months before referral for HAART.
- No convulsion nor mental confusion.
Examination

- Patient conscious, apyrexial; persistent involuntary movements of proximal and distal extremities left side and face.
- Lilting gait.
- No neck stiffness, funduscopy normal.
- Cranial nerves intact.
- Reflexes accentuated both sides equally.
- Resp. NAD.
- CVasc. NAD.
- Abdomen. NAD.
Assessment

- 43 year old male patient HIV + ve Stage 4 C (Extrapulmonary Tb, Cd4 30 cells/ul, VL 280 000 copies/ml) presenting involuntary movements which started 2 months ago.

- Dif. Diagnosis:
  1. Cerebral Toxoplasmosis
  2. Tuberculoma
  3. Cerebral Lymphoma
  4. Cerebral Cryptococcus infection
Assessment

Diagnosis:
1 HIV/AIDS. (Stage 4C)
2 Extrapulmonary TB.
3 Toxoplasmosis.
4 Hemi choreoathetosis.
Diagnostic planning

- Admission.
- CT scan of the brain.
- LP according to CT results.
- Neurology consultation.
Therapeutic planning

- Start Bactrim 4 single strength tabs bid.
- Continue Tb treatment.
- Multivitamins.
- Haloperidol 2 mgs bid.
- Defer HAART for two weeks until stabilize OI.
CT brain
MRI 2
Follow up

- Patient on HAART and evolving satisfactory, completed anti-TB and anti-Toxoplasmosis treatment, still on prophylaxis.
- Final diagnosis Cerebral Toxoplasmosis in a form of hemichorea.
Patient 2

- 20 year old female patient Dx HIV + ve Oct. 2005
- Multiples episodes of Pneumonia, AFB sputa and cultures x 3 negative.
- CD4 6 cells/ul.
- Viral load 120 000 copies/ml.
- Initial assessment satisfactory. CXR normal.
- Started HAART regimen 1A.
Cont....

- Brought for appointment 4 weeks later complaining of attack of fits 2 days before and thereafter mental confusion and headache.
- Lost 6 kgs in two weeks.
- Coughing whitish sputum, no night sweats.
Examination

- Patient conscious, but confused, lack of concentration, disorientated, apyrexial, GCS 15/15.
- Funduscoppy normal, no meningisms, unstable gait (unable to walk without aid).
- Resp. bronchial sounds, no creps.
- AFB sputa and cultures x 3 negative, CXR normal.
- Skin lesions on upper limbs abdomen and tights.
Assessment

- 20 year old female HIV +ve Stage 4C (Cryptococcal meningitis, severe Pneumonia, CD4 3cells/ul, VL 120 000 copies/ml)
- Had episode of seizures three weeks after initiation of HAART followed by mental disturbance and headache.

Dif. Diagnosis
1 Cryptococcal meningitis.
2 Toxoplasmosis.
3 Meningeal Tuberculosis.
4 Lymphoma.
5 PML.
Assessment

Diagnosis:
1 Cerebral Toxoplasmosis (IRIS).
2 Cryptococcomia.
3 Tuberculoma.
Diagnostic planning

- Toxoplasma antigen, CT scan of the brain, CXR, LP, U&E, LFT, FBC, CD4, AFB sputum and culture.
Therapeutic Planning

- Continue HAART regimen 1A.
- Start anti toxoplasma treatment.
- Continue anti Cryptococcal prophylaxis.
- Multivitamins.
Review after 3 weeks of Bactrim

- Patient feeling very well, no more fits, gained 14 kgs.
- CT brain results partially concordant with clinical evolution.
- Sputum AFB negative.
- CXR normal.
Cont....

- FBC, U&E, LFT normal.
- Toxo antigen positive.
- LP India ink negative, CLAT positive culture negative.
- CD4 89 cells/ul. 
- Plan MRI, continue HAART, reduce Bactrim, rest the same.
Review after 4 months of HAART

- C/o still coughing, LOA, lost 1kg in last month, seen at her clinic treated for CAP, but no improvement noted, had another episode of fits last week.
- O/E chest noisy air entry, both lungs; creps toward left lower zone.
CXR 2

- Opacification
  left lower zone
MRI
Cont…..

- Plan consult with neurologist for brain biopsy, decided repeat CT Brain at this stage and repeat LP, if no improvement biopsy.
- Sputum AFB culture.
- Continue HAART, continue Bactrim, start anti TB treatment on clinical basis, add valproic acid.
- Review in two weeks with new CT scan results.
Follow up after 2 weeks

- Patient clinically much better asymptomatic, good appetite, no new seizures, gained 2 kgs in last weeks.
- O/E chest clear, GCS 15/15 no focal signs.
- New CT brain shows improvement on lesions suggest tuberculomas?, toxoplasmosis?.
CT Brain 2
Follow up

- Final assessment HIV/AIDS stage 4C patient who developed IRIS double infection toxoplasmosis and tuberculosis, responding favorably to treatment.
An algorithmic diagnostic approach to intracranial mass lesions in HIV/AIDS

- Neurological symptoms are among the commonest presentation in HIV-infected patients and the detection of intracranial mass lesions on CT or MRI scans is a frequent and often difficult diagnostic and management problem in these patients.

- Microbiological agents as Toxoplasma gondii, Mycobacterium tuberculosis, Cryptococcus neoformans, Treponema pallidum, and others as well as CNS Lymphomas can produce very similar radiographic lesions on neuroimaging studies.

- A diagnostic approach that minimizes empiricism and the need for brain biopsy is the most desirable.
So there are some therapeutic and diagnostic algorithms that obviates the need for neurosurgical intervention. Basically they are based on clinical history, CD4 count, LP for India ink smear and Cryptococcal antigen, cytology, bacterial and AFB and serology for toxoplasma IgG and Syphilis. CXR, CT and MRI scans where available. Brain biopsy as the final resource.
Diagnostic algorithm 1

Focal lesion suspected

CT scan

Positive for focal lesion

Enhancement

Positive

Mass affect

No

Toxoplasma serology

Positive

Anti-toxoplasma medication effect (clinical, CT)

Negative

Studies for Epstein-Barr

Positive

Further evaluation serologic studies; LP

Negative

PML

Positive

PCR for JC Virus

Negative

Clinical follow-up; repeat study if new abnormalities develop

Negative

Lumbar puncture

Positive

Diagnosis established by CSF studies

Negative

CT with double dose contrast or MRI with gadolinium

Negative

Lumbar puncture

Positive

CT scan
Figure 1 Enhancing lesions on CT or MRI scan. ADA=adenosine deaminase; AFB=acid-fast bacilli; CSF=cerebrospinal fluid; CXR=chest X-ray; MRI=magnetic resonance imaging; PCR=polymerase chain reaction; PET=positronemission tomography; PML=progressive multifocal leukencephalopathy; Rx=treatment; SPECT=single positron-emission computed tomography (CT); TB=tuberculosis; toxo toxoplasma; toxo ab=toxoplasma antibodies.
Therapeutic algorithm for HIV-seropositive patients with enhancing CNS mass lesions, for use in resource-limited areas

<table>
<thead>
<tr>
<th>Patient acutely ill*</th>
<th>Toxoplasma IgG antibody</th>
<th>Chest X-ray</th>
<th>Initial empiric therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Negative</td>
<td>Chest X-ray suggestive of active or healed TB;or extra pulmonary TB known or suspected</td>
<td>Treat for TB</td>
</tr>
<tr>
<td>Yes</td>
<td>Negative</td>
<td>Chest X-ray suggestive of active or healed TB;or extra pulmonary TB known or suspected</td>
<td>Treat for TB and possibly for toxoplasmosis if CT scan suggestive(e.g., six lesions; small)</td>
</tr>
<tr>
<td>Yes or no</td>
<td>Positive</td>
<td>Chest X-ray suggestive of active or healed TB;or extra pulmonary TB known or suspected</td>
<td>Treat for both toxoplasmosis and TB</td>
</tr>
<tr>
<td>No</td>
<td>Positive</td>
<td>No infiltrate suggesting active or healed TB</td>
<td>Treat for toxoplasmosis</td>
</tr>
<tr>
<td>Yes</td>
<td>Positive</td>
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<td>Treat for both toxoplasmosis and TB</td>
</tr>
</tbody>
</table>
Laboratory investigations in the work-up of HIV-infected patients with CNS mass lesions

**Blood studies**
Complete blood count/differential
Syphilis serology (e.g., RPR or VDRL; TPHA or FTA-ABS)
Toxoplasma IgG antibody
CD4+ Lymphocyte count
HIV-1 RNA level (optional if antiretroviral therapy available)

**CSF studies**
*Routine*
RBC count and WBC count/differential
Protein, glucose, and chloride determinations
RPR or VDRL
India ink smear and cryptococcal antigen
ADA level and/or PCR for M. tuberculosis
CSF cytology
Smears and cultures (e.g., bacterial, AFB, and fungal)
*Additional (optional)*
Toxoplasma IgG antibody
PCR for Toxoplasma gondii, JC papova virus, EBV Anti-polyoma fluorescent antibody
pp65 antigen (for CMV)

**Radiological studies**
Chest X-ray
Functional neuroimaging scan (PET or SPECT scan)
Thanks you