Opportunistic infections

or rather...

How to pass the DipHIV OI OSCE station!

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DipHIV revision course
13/01/20
Objective

- Pass the DipHIV

- OSCE technique for OI station in brief

- What to do when disaster strikes!
  - 1 day to go & you can’t remember anything
  - You go blank in the exam
  - You don’t know what the X-Ray/results show

- 2 OI OSCE practice stations (3 extra stations to practice at home) - don’t cheat, all info on handout

- Not teaching on OIs – learn the guidelines...
OSCE TECHNIQUE AND WHAT TO DO WHEN DISASTER STRIKES!
What’s the point of the DipHIV?

• Do you know the guidelines inside out?
• Do you have a good patient manner?
• It is not an impossible exam!

• BHIVA Guidelines: OIs, TB, vaccination
• Beware of straying away from guidelines, regardless of your individual clinic’s policy
• ID trainees: don’t forget about STIs (syphilis, LGV, ?HSV)
OI syllabus

- Viral: CMV, HSV, VZV, EBV, HHV8, parvovirus, JC virus
- Bacteria: pneumococcus, haemophilus, nocardia, syphilis
- Tuberculosis, atypical mycobacterial infection
- Fungi: candida, pneumocystis, cryptococcus, aspergillus, fungi with specific geographical restriction
- Protozoa: toxoplasmosis and gut-related protozoa including cryptosporidium
- Helminths including strongyloidiasis
Candidate information sheet

• 3-5 mins between cases to read
• Copy on the desk when you enter the ‘room’
• Short history
• Results
  – Often lots of blood results
  – Units & normal ranges given
  – Scans/X-Rays may not be great quality
• Read carefully: “conception” vs “contraception”
• ‘Patient’ may be a relative or other doctor
Candidate information sheet

• Tasks: usually 3-4 – stick to them!
• Typically for OI station:
  – Discuss the results and what they mean
  – Discuss the differential diagnosis (aim for 1 main + 2 other reasonable ones)
  – Discuss the management plan
• “There is no need to discuss” – i.e. there are no marks for this
• The patient will also mark – be nice!
OSCE challenges

• To show your knowledge to the examiner while speaking to the patient
  • Make sure the patient understands
  • Give lots of opportunities to ask questions
  • Over-explain and give more detail
  • Keep to ‘lay language’ – pretend you’re in clinic

• Time management – important to allow you to collect the easy marks
Time management is everything

• Introduce yourself, confidentiality, personal questions, tell me if you don’t understand what I’m saying or you have a question: 30s
• Divide time between tasks between stations: max 8 mins – structured approach
• Check the patient understands & invite questions: 1 min
• Close: offer of further support including MDT, thank you & smile to the patient & examiner: 30s
Time management is everything

- Introduce yourself, confidentiality, personal questions, tell me if you don’t understand what I’m saying or you have a question: 30s
- Divide time between tasks between stations: max 8 mins – structured approach
- Check the patient understands & invite questions: 1 min
- Close: offer of further support including MDT, thank you & smile to the patient & examiner: 30s

Practice counselling for each OI in 8 mins absolute max
1 day to go & you can’t remember anything

• 10 min OSCE station – all about the patient
• No grilling by examiner
• Tell the patient what they need to know in language they can understand & allow them to ask questions
• Don’t knock short term memory – focus on most likely OIs to come up: CMV, PML, TB, MAI, PCP, cryptococcus, toxoplasmosis
What to do if you go blank in the exam

• Never give up or leave a station early
• Say what you would do in real life:
  – Stick to a structured answer
  – Try to imagine that you’re in clinic/on the ward
  – Seek a senior opinion
  – Involve the MDT
  – Don’t dwell on what you don’t know (e.g. doses)
• Ask the patient if they have any specific worries
What to do when you don’t know what the X-ray shows

• Case sounds like TB meningitis
• The X-Ray (or you) are rubbish!
• What do you do?
  – Manage with what you do know
  – Don’t make up what the X-Ray shows, but you can say what you would expect it to show (make this clear though)
  – Do what you would do in real life
  – Try not to panic – with good exam technique you can still pass the station
What I did...

“The X-Ray is not very good quality so it’s hard to tell what it’s showing. Your blood and lumbar puncture results suggest a number of possibilities including TB meningitis but there are other possibilities including etc etc... If you have TB, we may see signs of it in your lungs on your X-Ray. I’m going to go to speak to the radiologist so that we can look at your X-Ray on a better computer screen and I can get a second opinion.”
What I did...

“The X-Ray is not very good quality so it’s hard to tell what it’s showing. Your blood and lumbar puncture results suggest a number of possibilities including TB meningitis but there are others as well... If you have TB, we may see signs of it in your lungs on your X-Ray. I’m going to go speak to the radiologist so that I can get a better look at your X-Ray on a better computer screen and I can get a second opinion.”
What I did...

• “I’m sorry you are upset, this must be very frightening for you. Is there anything you are worried about in particular?”
• “I’m worried about TB meningitis”
• Discussed management of TB meningitis and was nice to patient
• Exam feedback: complained about the poor quality X-Ray
• I passed the station
PRACTICE OSCE STATIONS
OSCE 1

• John is a 34y old MSM with a 2 week history of fever, dry cough and feeling breathless

• You are reviewing him in the A&E department

• He has lost 10kg in weight

• He has been several times to his GP but has not mentioned that he has sex with men. On the last occasion he was given a course of antibiotics

• He has never had a previous HIV test
OSCE 1

- On examination he has oral candidiasis and oral hairy leukoplakia
- His chest was clear on auscultation
- A rapid HIV test returned positive
### Results

<table>
<thead>
<tr>
<th>Full Blood Count:</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb 10.6 g/dL (normal 13.0-18.0)</td>
<td>Respiratory rate 25/min</td>
</tr>
<tr>
<td>White cells count: 2.5 x 10⁹/L (normal 4.0-11.0)</td>
<td>Saturation on air 88% (normal &gt;95%)</td>
</tr>
<tr>
<td>Lymphocyte count 0.3 x 10⁹/L</td>
<td>Arterial gases on air: pO₂ 8.7 kPa; pCO₂ 3.4 kPa</td>
</tr>
<tr>
<td>Platelets 62 x10⁹/L (normal 150-400)</td>
<td>CURB score: 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biochemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin 28 g/L (normal 34-48)</td>
</tr>
<tr>
<td>CRP 440 mg/L (normal &lt;10)</td>
</tr>
</tbody>
</table>
Tasks

1. Discuss the potential causes of his breathlessness
2. Discuss management and follow up plan
3. Answer any questions he may have and address any concerns

John has been seen by the counsellor and informed of the HIV result. There is no need to discuss sexual health, HIV transmission, contact tracing, or specific ART combination. Please focus on the current illness.
Plan the station

• Intro: 30 seconds
• Discuss possible causes: 2 mins
• Discuss management & follow up plan
  – Investigations & further history: 2 mins
  – Management
    • Infection: 2 mins
    • ART & follow up: 2 mins
• Patient’s questions + understanding: 1 min
• Thank patient, support & close: 30 seconds
Discuss the potential causes of his breathlessness

• The most likely diagnosis:
  – PCP
  – \( pO_2 \) mild >11.0 kPa; moderate 8.1-11.0 kPa; severe <8.0 kPa

• Discuss differential diagnosis
  – TB, viral pneumonitis, standard/atypical pneumonia, pulmonary KS
Further investigations

• HIV related: CD4, VL, resistance
• Infection cause related
  – Sputum positive by PCR or histochemical/fluorescent stains (90%)
  – Induced sputum (50-90%), BAL (90-95%), transbronchial biopsy (>90-95%)
• Make sure that treatment & ART is safe to give
  – Allergies
  – Past / current medical history
  – Other drugs – prescribed / herbal / recreational
Management of infection

• Admission and start treatment for PCP immediately
• Co-trimoxazole: IV severe/oral mild to moderate, dose & administration route 3/52
• Mention AE (rash, leucopenia, fever, hepatitis)
• Prednisolone or methylprednisolone (not hydrocortisone): (pO₂ <9.3 kPa)
  – As soon as possible and within 72h
  – Tapering dose over 21/7: finish with completion of PCP treatment
• Oral or IV / oral depending on severity
• Prognosis: days before improvement, if deteriorating NIV/mechanical ventilation/ICU, IRIS rare
ART, & follow up

• ART
  – How to take/major side effects/toxicity/potential for DDIs
  – ART within 1-2w but NOT a specific combination

• PCP prophylaxis (co-trimoxazole) until CD4 >200 for 3m on suppressive ART

• Support for John: specialist nurses, peer support, you’ll visit to check he’s settled on the ward & bring your consultant to meet him
Patients questions & concerns!
OSCE 2

- Andrew’s son Jason, aged 31, was admitted to your unit three days ago with cryptococcal meningitis
- Jason has given permission for his diagnosis to be discussed with Andrew, his father, who is his next of kin. He is aware of his HIV status.
- Treatment for the meningitis has been started
OSCE 2

• Jason was diagnosed HIV positive 7 years ago but has been poor at accessing care.
• He has not taken ART for several years and was never adherent when taking it
• He presented with a 2-week history of headache and fever
Results

CSF
• CSF Opening pressure 58 cm/H₂O
• CSF India ink stain: Positive
• CSF Cryptococcal antigen 1:320

Bloods
• CD4 6 cells/μL
• Viral Load 1,275,345 c/mL
• Resistance test Awaited
• Plasma cryptococcal antigen 1:5120

Imaging
• CT brain scan Normal
Tasks

1. Update Andrew on the results of Jason’s tests
2. Discuss the diagnosis and prognosis
3. Explain his treatment & future management
4. Answer any questions he may have and address any concerns

In your discussion, there is no need to discuss issues with regard to HIV transmission regarding Andrew’s son Jason. There is no need to discuss specific ART. Please focus on his current illness
Plan the station

• Intro: 30 seconds
• Update on the results of the tests: 2 mins
• Discusses the diagnosis and prognosis: 2 mins
• Explains his treatment and future management
  – Investigations: 2 mins
  – Management: 2 mins
• Relative’s questions + understanding: 1 min
• Thank patient, support & close: 30 seconds
Update on the results of the tests

• Don’t go over the HIV result – known positive for 7y

• Tests on his spinal fluid confirm that he has cryptococcal meningitis (India ink stain, CSF Cryptococcal antigen)

• This is causing a rise in the pressure in his head (opening pressure)

• He has meningitis because his immune system is weak as a result of his HIV being uncontrolled (CD4, VL)

• His brain scan is normal
Discuss the diagnosis and prognosis

• Explain cryptococcal meningitis in lay terms

• Discuss prognosis
  – Be truthful but kind
Explain his treatment and future management: investigations

- HIV related
  - Resistance + previous resistance tests
  - HLA B5701/tropism
  - Full ARV history
  - Say you’ll discuss with pt: previous side effects, toxicities, other factors around adherence

- Infection cause related
  - Monitoring for AE
  - Other OI screening
Explain his treatment and future management: management

- Confirm started treatment for cryptococcal meningitis/administration route
- Liposomal amphotericin B + 5-flucytosine 100mg/kg/d or fluconazole 1200mg for induction for 2 weeks
- Then fluconazole 800mg/d for 8/52 or until CSF sterile
- Mention AE being monitored for
Careful monitoring of ICP & management

• As opening pressure > 25 cm H2O drain until < 20cm or 50% of initial pressure
• Repeat daily until stable & repeat if deteriorates
• In resistant cases consider lumbar drain or VP shunt
Explain his treatment and future management: management

• Chronic maintenance therapy
  – Lifelong if CD4 remains <200 cells/mL
  – Until immune reconstitution on ART >200 cells/mL for 6m

• ART at \(\approx 4\)w **NOT a specific combination**

• Other OI prophylaxis
Patients questions & concerns!
Acknowledgements

• Dr Ed Wilkins
• Dr Cara Saxon

• Good luck, stay calm, you can pass this!

• OSCE stations for home practice follow this
OSCE 3

• Livingstone is 37y old sub-Saharan African man.
• For 2 weeks he has had headaches and fever
• 7 days ago he had a fit at work. A CT scan was reported as showing a “brain tumour”
• The patient recognised he was at risk for HIV and had a test done at your clinic which was positive
OSCE 3

• He has been informed of the CT by the GP and HIV results by the clinic staff but you are the first doctor he has seen
• There is no other significant PMH or co-morbidity
• He works as a welder in a steel factory
• On examination he has mild weakness in his left upper limb but nil else
# Results

<table>
<thead>
<tr>
<th><strong>Full blood count:</strong></th>
<th><strong>Other</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb 11.6 g/dL (normal 13.0-18.0)</td>
<td>HBV surface antigen negative</td>
</tr>
<tr>
<td>White cells count: 3.5 x 10⁹/L (normal 4.0-11.0)</td>
<td>HCV antibody negative</td>
</tr>
<tr>
<td>Lymphocyte count 0.5 x 10⁹/L</td>
<td>GCS score 15/15</td>
</tr>
<tr>
<td>Platelets 162 x10⁹/L (normal 150-400)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Biochemistry</strong></th>
<th><strong>Imaging</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin 34 g/L (normal 34-48)</td>
<td>MR scan (shown): contrast enhanced T1</td>
</tr>
<tr>
<td>CRP 30 mg/L (normal &lt;10)</td>
<td>CXR normal</td>
</tr>
</tbody>
</table>
Tasks

1. Discuss the potential cause of his ‘brain tumour’
2. Discuss management, prognosis, and follow up plan.
3. Answer any questions he may have and address any concerns.

In your discussion with Livingstone, there is no need to discuss issues with regard to HIV transmission, contact tracing, or an ART combination. Please focus on his current illness
### MR FEATURES

<table>
<thead>
<tr>
<th></th>
<th>TOXOPLASMOSIS</th>
<th>Primary CNS Lymphoma</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
<td>Usually multiple</td>
<td>Single-few</td>
</tr>
<tr>
<td><strong>Enhancement</strong></td>
<td>Prominent Ring</td>
<td>Prominent Homogeneous</td>
</tr>
<tr>
<td><strong>Oedema</strong></td>
<td>Marked</td>
<td>Mild-moderate</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>Basal ganglia</td>
<td>Periventricular</td>
</tr>
<tr>
<td></td>
<td>Brain stem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cortical</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interface grey-white matter</td>
<td>Anywhere</td>
</tr>
<tr>
<td><strong>MR T1</strong></td>
<td>Low signal</td>
<td>Low to isodense</td>
</tr>
<tr>
<td><strong>MR T2</strong></td>
<td>High signal</td>
<td>Variable</td>
</tr>
</tbody>
</table>
Plan the station

• Intro:
• Discuss the potential cause of his ‘brain tumour’:
• Management
  – Investigations:
  – Management:
• Prognosis & follow up:
• Questions & understanding:
• Thank patient, support & close:
Discuss the potential cause of his ‘brain tumour’

• Most likely/important diagnosis
  – Cerebral toxoplasmosis

• Give 2 other possible causes
  – Primary CNS lymphoma, tuberculoma, PML, abscess, metastasis, aspergillosis, syphilis, Cryptococccoma, glioma
Discuss management, prognosis, and follow up plan: investigations

• HIV related (including pre-treatment screening): CD4, VL, resistance

• Infection cause related

• Do I need a biopsy?
  – Empiric therapy fails
  – History of co-trimoxazole prophylaxis
  – Relapse on tailing off steroids if receiving
  – Single atypical lesion
  – CD4 >200 cells/mL
Discuss management, prognosis, and follow up plan: management

- Admission & treatment **immediately**
- Sulphadiazine/pyrimethamine and folinic acid (administration route, 6/52)
- Give dexamethasone if midline shift/brainstem involvement 4mg QDS tapering (can cloud clinical picture)
- Checks no history of allergies/mention AE
- Duration course/days before improvement
- ART within 2-3w but NOT a specific combination
Prognosis & follow up

• Prognosis: be truthful but kind
• Stopping co-trimoxazole maintenance:
  – When CD4 >200 cells/mL for 6m on suppressive ART
• Repeat imaging after 2-4/52 treatment
• Clinical improvement: 50% at 5d, 70% at 7d and 90% at 14d of treatment
• Failure to improve at 2/52 indicates likely PCNSL
Patients questions & concerns!
OSCE 4

• Mike is a 43yr old single engineer contracted to Nigeria
• Over the last 5y he has had unsafe sex with several African partners
• He has been admitted to your ward with fever, weight loss 6m, pain on swallowing and diarrhoea
• An HIV test has been performed and he has been informed the result is positive
• A PA CXR has been performed
Mike has been suffering from increasing productive cough and breathlessness over the last 6 weeks. He is a non-smoker.

On examination he is febrile (38.5°C), cachectic, and has oropharyngeal candidiasis, generalised lymphadenopathy, and hepatosplenomegaly.
## Investigations

<table>
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<th>Full blood count:</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb 9.6 g/dL (normal 13.0-18.0)</td>
<td>Respiratory rate 25/min</td>
</tr>
<tr>
<td>White cells count: 2.5 x 10^9/L (normal 4.0-11.0)</td>
<td>Saturation on air 96% (normal &gt;95%)</td>
</tr>
<tr>
<td>Lymphocyte count 0.4 x 10^9/L</td>
<td>Induced sputum: AFB -ve, PCP PCR -ve</td>
</tr>
<tr>
<td>Platelets 112 x10^9/L (normal 150-400)</td>
<td>CURB score: 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biochemistry</th>
<th>HIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin 28 g/L (normal 34-48)</td>
<td>CD4 12 cells/mL</td>
</tr>
<tr>
<td>CRP 240 mg/L (normal &lt;10)</td>
<td>Viral load 245,000 c/ml</td>
</tr>
<tr>
<td></td>
<td>Resistance test awaited</td>
</tr>
</tbody>
</table>
Tasks:

1. Discuss the potential cause of his current symptoms
2. Discuss management of his current illness and his HIV
3. Answer any questions he may have and address any concerns.

In your discussion with Mike, there is no need to discuss issues with regard to HIV transmission, or contact tracing. Please focus on Mike’s current illness.
Admission PA Chest X-Ray
Plan the station

• Intro:

• Discuss the potential cause of his current symptoms

• Discuss management of his current illness and his HIV
  – Investigations
  – Management

• Patient’s questions + understanding:

• Thank patient, support & close:
Discuss the potential cause of his current symptoms

• Explain the most likely/important diagnosis
  – TB

• Give 2 other possible causes
  – Non-tuberculous mycobacteria, nocardiosis, rhodococcus, bacterial pneumonia, melioidosis, cryptococcus, histoplasmosis, aspergillosis etc.
Discusses management of his current illness & HIV: investigations

– HIV related (including pre-treatment screening)
– Infection cause related (TB probe/resistance)
Discusses management of his current illness & HIV: management

- Infection treatment – *SPELL IT OUT* but in understandable language
- ART (again explain in plain English)
- Remember DDI’s, major side effects/toxicity, when to start *and IRIS*
TB – key points in management

Standard RHZE if:

• DNA probe confirms M. tuberculosis
• RIF/INH sensitive
• May need to treat for >6m given:
  – Severity of disease
  – Profound immunodeficiency
• Remember MDRTB more likely
HIV – key points to remember in choosing ART

• Remember DDI’s
  – Including over the counter/herbal medicine interactions

• Check information as to whether any clues regarding:
  – CVD risk and renal dysfunction

• Remember to discuss potential common AE

• Remember to mention when ART will commence

• Remember to mention IRIS
TB – key points in management: scenarios

**Resistance present**

**MDRTB**
- Isoniazid *plus*
- Rifampicin

**XDRTB**
- MDRTB *plus*
- Aminoglycoside (not SM) *plus*
- Quinolone

**Clinical context**

‘Problem’ situations
- Standard treatment
- DRTB including MDR and XDRTB
- Acute drug reaction (usually hepatitis)
- Need to cover MAI and MTB as uncertainty as to cause
- IRIS (17%)
Patients questions & concerns!
OSCE 5

• Yan Ling is 24y old from Bangkok visiting relatives in London

• He presents to A&E with 6w fever and loss of weight, and 3w of flashing lights and blurred vision in his left eye

• He has a PMHx of herpes zoster and pulmonary TB in the last 2 years

• **A rapid HIV test is positive** and you are called down to review him
OSCE 5

• Dilated fundoscopy reveals abnormal findings (picture provided) in his left eye
• He has never had a previous HIV test to his knowledge
• He is a non-smoker and drinks occasionally
• He has no regular partner and no children
## Results

<table>
<thead>
<tr>
<th>Full blood count:</th>
<th>Biochemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb 8.6 g/dL (normal 13.0-18.0)</td>
<td>Creatinine 67 µmol/l</td>
</tr>
<tr>
<td>White cells count: 2.3 x 10^9/L (normal 4.0-11.0)</td>
<td>EGFR 118 mL/min/1.73 m²</td>
</tr>
<tr>
<td>Lymphocyte count 0.3 x 10^9/L</td>
<td>ALT/AST normal</td>
</tr>
<tr>
<td>Platelets 89 x10^9/L (normal 150-400)</td>
<td></td>
</tr>
</tbody>
</table>

### Microbiology

STS negative
HBsAg negative
Tasks:

1. Discuss the potential causes of his eye symptoms
2. Discuss management and follow up plan.
3. Answer any questions he may have and address any concerns.

In your discussion with Yan Ling, there is no need to discuss issues with regard to HIV transmission, or contact tracing. Nor is there need to discuss specific ARV choices.
Plan the station

• Intro:

• Discuss the potential causes of his eye symptoms

• Discuss management and follow up plan
  – Investigations:
  – Management:
  – Follow up:

• Patient’s questions + understanding:

• Thank patient, support & close:
Discuss the potential causes of his eye symptoms

• Explain the most likely/important diagnosis
  – CMV

• Gives 2 other possible causes:
  – Toxoplasmosis, syphilis, TB, acute retinal necrosis, PORN, cryptococcus
Discuss management and follow-up plans

• Mention need for ophthalmology referral and future follow-up
• Explain treatment: drugs (SPELL OUT), route of administration, course length etc.
• Mention potential side effects and need for monitoring bloods
• Explain timing of ART
• Mention IRIS
Key points to notice in history, results, and fundoscopy

- **History:** subacute
- **Presentation:**
  - Peripheral: flashing lights, floaters, field defects,
  - Central: reduced visual acuity, field defects
- **Examination:**
  - Well-demarcated haemorrhagic exudates
  - Usually peripheral and along vessels
  - 10% of cases bilateral
- **Results:** CD4 <50, CMV-PCR usually positive
If appropriate mention complications / prognosis

• This may well be a directed question from the patient – “Will I go blind”

• Complications:
  – Macular involvement, detached retina, rarely CNS involvement, blindness in 5%; permanent deficit in affected areas
Patients questions & concerns!