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Teaching your learners clinical reasoning and how to avoid common diagnostic errors

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Medical diagnosis is a cornerstone of general internal medicine. In order to accurately diagnose a condition and help refine a differential diagnosis, physicians and health care providers routinely use mental heuristics and clinical reasoning cues. Several factors can limit a provider's ability to accurately diagnose a condition or reason through a diagnosis systematically. This is especially true for less experienced providers and physicians in training. It is therefore important for health care providers to understand basic principles of clinical reasoning and develop tools to teach their learners how to avoid common diagnostic errors. In this session, we will discuss medical heuristics, basic principles and diagnostic theory that serve as a foundation for clinical reasoning. We will then provide the participants with practical tools and a stepwise approach that will enable them to teach their learners how to avoid common diagnostic errors. The objectives of the study are to review the key models used to conceptualize clinical reasoning, understand the major cognitive biases and how they can contribute to diagnostic error, utilize a framework to identify learners with clinical reasoning deficits and discuss strategies to help learners with clinical reasoning deficits.

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Concurrent central nervous system infective pathology in a severely immunocompromised patient

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Co-infection of the central nervous system (CNS) with bacteria and fungi is rare and clinicians should be aware of these infections in especially immunocompromised patients. To our knowledge and literature search, concurrent cryptococcal meningitis and neurosyphilis in a patient with human immunodeficiency virus (HIV) infection has rarely been reported. A 37 year-old male with past medical history of human immunodeficiency virus (HIV) infection presented to Emergency Department (ED) with complaints of bi-temporal headache and dizziness for 5 days along with memory loss and personality change for about 1 week. Initial vital signs were within normal limit except tachycardia with pulse rate of 123 beats per minute and tachypnea with respiratory rate of 20 breaths per minute. Physical examination revealed nuchal rigidity with positive Kernig's sign. Immunologic tests showed percent CD4 cells 0.9%, absolute CD4 count 6 cells/micro liter, percent CD3 cells 66.3%, absolute CD3 count 418 cells/ micro liter, T-lymphocyte CD4/CD8 ratio 0.02 (normal 0.6-4.4). Other blood tests showed HIV RNA polymerase chain reaction (PCR) 263994, HIV RNA PCR log 10 value 5.42 (normal <1.3) and serum cryptococcal antigen positive with antigen titer 1:160. Patient's serum rapid plasma reagin (RPR) test was positive, along with positive serum fluorescent treponemal antibody absorption (FTA-ABS) test. He underwent lumbar puncture and cryptococcal meningitis was confirmed with positive cerebral spinal fluid (CSF) cryptococcal antigen titer (1:320) and positive CSF culture. Diagnosis of neurosyphilis was made based upon CSF white blood cell count of 85 cells/micro liter with CSF total protein of 87 mg/dL, reactive CSF treponemal antibody and fluorescent treponemal antibody (FTA). There was no red blood cell in CSF findings. Patient was treated with amphotericin B, flucytosine, fluconazole and benzathine penicillin G. Dapsone and azithromycin were given for prophylaxis of opportunistic infections in immunocompromised state. Abacavir, dolutegravir, lamivudine combination was started as a highly active anti-retroviral treatment (HAART) regimen and he was discharged from the hospital. Nine months later, in follow up visit, patient's blood tests revealed CD4 count of 85 cells/micro liter, HIV RNA viral load (PCR) of 51 and HIV RNA PCR log 10 value of 1.71. Patient was apparently in good health without any headache, memory loss, personality change or neurological deficits. Cryptococcal meningitis, especially in HIV infected patients, frequently results in relatively minor CSF changes. However, higher than expected protein and cell count in CSF could indicate co-infection. Awareness should be made not only to single infection but also for dual pathology for a better and life-saving management.

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