

Rhode Island Chapter, American College of Physicians 2009 Annual Meeting Abstracts

In June 2009, the Rhode Island Chapter, American College of Physicians hosted its annual Associates' Forum Competition at the Radisson Airport Hotel in Warwick. Over 80 residents in Rhode Island's teaching hospitals submitted entries. A committee of program directors chose the following six winners. These six podium presenters each received a plaque and a cash award from the College Chapter. The Chapter applauds this year's Associates—they represent the future of medicine in the United States.

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When Lying Down Is Better Than Sitting Up: Orthodeoxia/Platypnea Syndrome

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Orthodeoxia/Platypnea Syndrome refers to dyspnea and decreased blood oxygen saturation when in the upright compared to the supine position. The rarity of this condition provides a diagnostic challenge. Our patient is an 83-year-old woman with history of a prior deep venous thromboembolism/pulmonary embolus previously on coumadin therapy who presented with shortness of breath. On physical exam she was tachycardic, tachypneic, and hypoxic. EKG demonstrated sinus tachycardia, and a chest X-ray showed no acute pathology. CT angiogram visualized a right upper lobe subsegmental acute pulmonary embolus. She was promptly started on anticoagulation with a heparin drip and admitted. During her inpatient stay she was noticed to have positional hypoxia/dyspnea on pulse oximetry that occurred when sitting up. This finding was corroborated by arterial blood gas measurements, which showed a pH of 7.44, PaO₂ of 60, and SaO₂ of 92% while supine, and while sitting up a pH of 7.48, PaO₂ of 44, and SaO₂ of 84% on room air. Accordingly, a diagnosis of platypnea/orthodeoxia syndrome was established, and a physiologic shunt was considered. The patient had no evidence of liver disease or neurologic disease to suggest hepatopulmonary syndrome or autonomic dysfunction. She was a life-long nonsmoker without evidence of emphysema on chest x-ray or pulmonary arteriovenous malformations on CT Chest. Transthoracic echocardiogram showed a normal left ventricle with low nor-

mal systolic function. However, transesophageal echocardiogram showed an aneurysmal inter-atrial septum with a large patent foramen ovale and small atrial septal defect. With the patient supine a small left to right shunt was observed by color doppler, but with the patient upright at a 70 degree angle, there was a brisk jet flow from right to left through the PFO wrapping around the left atrium. After right heart catheterization to ensure that her pulmonary artery pressures were not markedly elevated, the PFO was closed using an Amplatzer cribiform closure device guided by echocardiography. At the end of the procedure an IVC filter was also placed. One day post-procedure, transthoracic echocardiogram revealed an intact intra-atrial septum without evidence of shunting by agitated saline injection. On the day of discharge the patient no longer showed any evidence of platypnea or orthodeoxia with an upright pulse oximetry oxygen saturation of 95%, and was discharged back to assisted living. This case reminds us that when a diagnosis does not fully explain our findings that we need to delve further, as a small subsegmental pulmonary embolus did not fully explain our patient's hypoxia. Also, with the high prevalence of patent foramen ovale in the population, providers should keep this rare diagnosis in their differential when dealing with any report of positionally-dependent dyspnea, which can be initially investigated quickly, cheaply, and non-invasively via pulse oximetry.

Acute Disseminated Encephalomyelitis in a Patient Presenting With an Asthma Exacerbation

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Acute disseminated encephalomyelitis (ADEM) is a demyelinating disease of the CNS thought to be autoimmune in etiology. It is typically associated with an antecedent viral infection or immunization. Clinical presentations vary widely

depending on the degree and location of demyelination. Although theories abound, a definitive pathogenesis has not yet been determined.

Case Description: A 39 year-old female smoker with mild

asthma presented to the Emergency Department with three days of cough, fever, and dyspnea. She took no medications. Clinical and radiologic examinations confirmed pneumonia and acute asthma exacerbation. She was admitted to the medical floor and treated with moxifloxacin, steroids, and bronchodilators. Two days later she was emergently intubated for hypoxic respiratory failure and transferred to the intensive care unit. CT pulmonary angiogram revealed no emboli but confirmed severe multilobar pneumonia with ground-glass opacities and hilar and mediastinal lymphadenopathy. Bronchoscopy revealed friable mucosa with minimal secretions and bronchioalveolar lavage fluid grew Adenovirus. All other cultures, including bacterial, fungal, and acid-fast bacilli were negative.

Upon extubation six days later, she demonstrated diminished cognitive function, profound muscle weakness, and sensory deficits in her upper and lower extremities. Initially, these deficits were attributed to neuropathy of critical illness. However, a CT brain obtained after a mechanical fall showed diffuse white matter disease. Subsequent contrast MRI of the brain demonstrated profound cortical white matter disease and punctate hemorrhages consistent with ADEM. Contrast MRI of the entire spine was unremarkable. Lumbar puncture revealed 12,900 RBC/cmm, 12 nucleated cells/cmm (46% lym-

phocytes, 46% macrophages, 8% neutrophils) and strongly positive adenovirus serologies (>1:512). In the CSF, serologies for HSV, CMV, and syphilis as well as viral PCR for JC virus, EBV, CMV, and VZV were all negative.

The patient's cognitive and neurologic symptoms improved dramatically prior to discharge on high-dose steroids. Nine months later a bilateral foot-drop remains. Sensory deficits persist in her lower extremities accompanied by neuropathic pain that has partially responded to gabapentin.

Discussion: This case describes a unique association between a rare, serious neurologic disorder and a common, typically benign virus. Adenovirus usually causes a mild respiratory infection or keratoconjunctivitis, but severe pneumonia in healthy adults (most commonly military recruits) has been well described. Although neurologic complications such as meningitis and encephalitis have been reported, the association between adenovirus and ADEM is novel. While quantitative PCR of the CSF is diagnostic of CNS infection, the clinical and serologic correlations strongly support Adenovirus as a causative agent in this patient. The recent rise in severe Adenovirus infections and the association with a serious CNS complication underscore the need for early evaluation and treatment. Efficacy of early therapy with antiviral medications such as cidofovir has been demonstrated.

Viremia in Vietnam: Viral Load Surveillance in the Era of Rapid Scale UP

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Since 2003, the global HIV community has benefited greatly from a rapid scaling up of **antiretroviral therapy (ARV)** to resource-limited settings. Despite the increased options and access to ARV, there is no standard guideline on viral load surveillance in these settings. Many ARV sites in resource-limited settings traditionally adopt a selective approach to viral load surveillance, doing so only under clinical suspicion for virologic failure. Our study attempts to identify the features associated with viral load testing and viremia among patients on ARV in an HIV center in Ho Chi Minh City, Vietnam.

METHODS: An Hoa **Day Care Center (DCC)** is a medical center that provides ARV and HIV – related services in District 6 of Ho Chi Minh City, Vietnam. The site is funded by the **US President's Emergency Plan for AIDS Relief (PEPFAR)**, with technical and administrative support from the Vietnamese Ministry of Health, and the non-governmental organization **Medicins du Monde (MdM)** since 2005. We conducted a cross – sectional review of patients attending the An Hoa DCC who have been on ARV for greater than one year and who received viral load testing.

RESULTS: A total of 203 patients were evaluated. The median age at registration to DCC was 26. Eighty three percent were male, and 73.4% (had a history of **injection drug use (IDU)**). Approximately 25% (51) had detectable **viral loads (VL)**, of which 92% (47) had VL above 400 copies / ml. Detectable viremia was associated with female gender ($p <$

0.023), history of ARV prior to registration to DCC ($p < 0.002$), documented immunologic failure ($p < 0.0009$), documented clinical failure ($p < 0.008$), and a history of 1st line ARV modification (OR2.6 CI 95% 1.1 to 6.0). Of the 203 patients who received viral load monitoring, 27 (13.3%) were performed under traditional, selective criteria. One hundred and seventy six (87.7%) underwent viral load monitoring under non-selective criteria (non-traditional, routine approach). The sensitivity of the selective, traditional approach of VL monitoring was found to be 29.4% in detecting patients with detectable VL, 31.9% in detecting patients with VL > 400 copies/ml, 60.9% in detecting patients with VL > 10,000 copies/ml.

DISCUSSION: Our review demonstrates an association between detectable viremia and female gender, history of ARV use prior to DCC registration, history of clinical and immunologic failure, and history of 1st line ARV modification. We have identified possible risk factors for virologic failure among patients receiving ARV for greater than one year. Furthermore, our study has shown that the traditional, selective approach to virologic surveillance may be insensitive to detecting detectable viremia.

CONCLUSION: As access and options to ARV treatment increase in resource limited settings, the approach to virologic surveillance needs to be re-defined.

A Case of Mistaken Identity: Accidental ingestion of the Jack O'Lantern Mushroom (*Omphalotus olearius*) Causing Muscarine Toxicity

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Mushrooms are an important ingredient in many cuisines throughout the world. Of the known 5000 species, 50-100 have been associated with myriad toxic syndromes. While commercially available mushrooms have an excellent safety profile, cases of ingestion of toxic species are well described, especially in Europe and Asia. Knowledge of syndromes related to mycotoxin ingestion is important given the increasing popularity of mushroom hunting (for purposes of nutrition, culinary diversity, or hobby) and mushroom ingestion for hallucinogenic purposes on college campuses.

A 56 year-old woman from Laos, with no medical history, presented to the emergency room promptly after experiencing acute onset, copious, non-bloody vomiting, salivation, lacrimation, diaphoresis, and stomach upset. The patient mentioned ingestion of multiple, orange-colored, sweet-tasting mushrooms approximately 2-3 hours prior and has eaten similar mushrooms without consequence in the past. She was afebrile, with blood pressure 169/104, heart rate 98, breathing 22 times per minute, and normal pulse oximetry. Physical exam was remarkable for increasing confusion and lethargy, diaphoresis, lacrimation, salivation, miosis, and mild wheezing on chest auscultation.

Initial laboratory evaluation was notable for leukocytosis of 17.3 with 43% neutrophils, and 0% bands, amylase of 273, and lactate of 4.9. Chem-7, LFTs, Urine toxicology screen, UA, CSF cell count and differential were unremarkable.

She was administered activated charcoal, and given her lethargy and persistent vomiting, was intubated for airway pro-

tection. After discussion with Poison Control, it was felt that her clinical syndrome was most consistent with muscarine toxicity, although the patient's altered mental status suggested the presence of a second, hallucinatory agent. Given the lack of concerning hypotension or bradycardia, no atropine boluses were administered. She was given supportive care and extubated approximately 18 hours later. Given her description of the ingested mushrooms as well as her choice from a lineup of different mushroom pictures, the offending mushroom was identified as *Omphalotus olearius*, also known as the North American Jack O'Lantern Mushroom, and often confused with the edible chanterelle.

Muscarine is a compound similar to acetylcholine, and contained in a variety of mushrooms including *Omphalotus olearius*, capable of stimulating peripheral, muscarinic, cholinergic receptors. It is not degraded by cholinesterase, causing peripheral cholinergic symptoms lasting several hours. These symptoms include salivation, lacrimation, emesis, urination, diarrhea, miosis, bronchorrhea, and bronchospasm. Muscarine does not cross the blood-brain barrier and does not cause central cholinergic symptoms. Significant morbidity and mortality is uncommon, and care is primarily supportive with rehydration and atropine boluses for bradycardia and associated hypotension. There are no measurable markers of muscarine or its metabolites in body fluids and diagnosis is made clinically. Knowledge of the muscarinic toxidrome is important given the variety of cultural practices regarding mushroom ingestion.

Vitamin D: A Potential Supplement To Protect Pancreatic Beta Cell Function for Type I diabetes

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Type I diabetes is characterized by dysfunctional beta cells leading to insulin deficiency. Identifying agents capable of preventing beta cell damage offers a potential treatment. Studies have shown that individuals with more exposure to vitamin D are at a lower risk for Type I diabetes. Vitamin D may affect beta cell function. Receptors for 1 alpha 25-dihydroxyvitamin-D3 have been identified in pancreatic beta-cells. Hence, we propose that Vitamin D may affect beta cells by preventing damage and by promoting cell function, which can be measured by enhancing insulin secretion.

Methods: Rat pancreatic beta cell line (INS-1) cultured with serum free medium was used in this study. Cells were treated with IL-1beta and STZ to induce damage (damage model). Test cultures were co-administered with IL-1beta

(1nM) and STZ (8µM) (experimental groups) for 48 hours; to test if Vitamin D is capable of preventing damage. Culture media was extracted at the end of the experiment and an insulin ELISA kit was used to measure media insulin content.

Results: STZ and IL-1b both showed to cause beta cell damage leading to a lower level of insulin secretion (Control vs STZ: 22.86 +/- 4.5 vs 7.68 +/- 1.1 (P<0.01), and Control vs IL-1 beta: 59.95 +/- 16.80 vs 94.26 +/- 32.75 (p<0.05)]. In addition, test groups (groups administered vitamin D co-treatment) showed that Vitamin D was able to prevent beta cell damage in co-administered circumstances (Control vs STZ and Vitamin D: 59.95 +/- 16.80 vs 102.92 +/- 21.26 (P<0.05), and Control vs IL-1 beta and Vitamin D: 59.95 +/- 16.80 vs 134.18 +/- 54.07 (P<0.05)].

Conclusion: This study suggests that Vitamin D may have a direct effect on preventing beta cell damage and sustaining insulin secretion. The phenomenon of Vitamin D preventing beta cell damage may be possible through activating Vi-

tamin D receptors on beta cell surfaces, and consequently activating signal transduction pathways in beta cells. However, further studies are required to confirm the mechanisms of these findings.

A Pilot Study Comparing WHI criteria to Framingham Heart Study Congestive Heart Failure Criteria

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There is no universally accepted standard epidemiologic algorithm used to define Congestive Heart Failure (CHF) . We compared CHF diagnosed by the **Women's Health Initiative (WHI)** to the **Framingham Heart Study (FHS)** criteria at one clinical center, in the WHI, to better understand the precipitating causes and echocardiographic finding associated with CHF potentially available in the WHI study if the present outcome packets for CHF were re-adjudicated.

Methods: Retrospective chart review of 104 WHI participants diagnosed with incident CHF according to Women Health Initiative criteria was performed in duplicate by two adjudicators. We classified patient presentations to definite, probable, or no CHF based upon FHS criteria (2 major or 1 major and 2 minor criteria were considered to have Definite CHF; Probable CHF was diagnosed when patients didn't meet criteria for definite CHF, but still had sign, symptoms and X ray finding suggestive of CHF; No CHF was diagnosed when patients had alternative diagnosis to explain there findings. **Results:** Of 104 patients with CHF according to WHI suggested criteria, 79(75.9%) patients had definite CHF by Framingham criteria, 19(18.3%) pts had probable CHF, and 6(5.8%) pa-

tients had no CHF. Of those meeting both WHI and Framingham criteria for CHF (n=79) precipitating causes were: Atrial Fibrillation -16(20.3%), ACS/MI-12(15.2%), Post-operative- 3(3.8%), Volume overload- 3(3.8%), Mitral regurgitation- 2(2.5%), medication noncompliance-1(1.26%), Right sided CHF-1(1.26%), HTN crisis- 1(1.26%), pericardial effusion with tamponade-1(1.26%), Unknown etiology-39(49.36%). Echoes were performed on 70 (71.4%) patients with definite or probable CHF .Echo results showed Systolic CHF in 22 (31.4%), Non Systolic CHF in 48(68.6%). Wall motion abnormality was recorded in 43 cases (61.4%), and Valvular abnormality was recorded in 26(37.1%) cases. **Conclusion:** Most post-menopausal women with incident CHF met both WHI and FHS criteria for CHF. Approximately 50% had an obvious precipitating cause. Non systolic heart failure was much more common than systolic heart failure in those with cardiac echoes. Re-adjudication of CHF within WHI defining the precipitating cause and echo finding would add substantially to its scientific contribution regarding the natural history and etiology associations with CHF in post menopausal women.

