Neuropsychiatric Masquerades: Medical and Neurological Disorders That Present With Psychiatric Symptoms

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Faculty Disclosure

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Learning Objectives

- By participating in this session, you will be able to:
  - Recognize the most common infectious disorders presenting with psychiatric symptoms
  - Explain the incidence, epidemiology and clinical features of the most common neuropsychiatric disorders masquerading as psychiatric illness
  - Recommend the research-based, effective treatment options for these conditions

Clues Suggestive of "Organic" Mental Disorders

- New onset psychiatric symptoms presenting after age 40
- Symptoms occurring …
  - During the course of a major medical illness impairing organ function (e.g., neurological, endocrine, renal, hepatic, cardiac, pulmonary) or
  - While taking medications having psychoactive effects

Clues Suggestive of “Organic” Mental Disorders

- History of taking multiple medication (both prescribed and OTC)
- History of substance abuse
- Family history of degenerative or inheritable neurological disorders (e.g., Alzheimer’s disease, Huntington’s disease)
- Family history of inheritable metabolic disorders (e.g., DM, Pernicious Anemia, Porphyria)

Clues Suggestive of “Organic” Mental Disorders

- Presence of altered states of mind, LOC, mental status changes, cognitive impairment; episodic, recurrent, cyclic course
- Cortical dysfunction (e.g., dysphagia, apraxia, agnosia, visuospatial)
- Diffuse subcortical dysfunction (e.g., slowed speech/ mentation/ movement, ataxia, incoordination, tremor, chorea, asterexis, dysarthria
- Presence of visual, tactile or olfactory hallucinations

Clues Suggestive of “Organic” Mental Disorders

- Physical findings:
  - Abnormal vital signs
  - Evidence of organ dysfunction, focal neurological deficits
  - Gait abnormalities
  - Changes in strength: weakness, paralysis
  - Gait abnormalities: ataxia
  - Speech: slurring, aphasia, word finding difficulties, perseveration
  - Eye exam:
    - Pupilary changes—asymmetries
    - Nystagmus (often a sign of drug intoxication)

Lab Tests For Detecting Physical Illness In Ψ Patients

- CBC
- Chemistry panel
- TFT’s
- Screening test for syphilis (VDRL or RPR)
- HIV serology for high risk patients
- B12 and folate
- Urinalysis (with protein and glucose levels)
- Toxicology screening
- Urine for uroporphyrias and porphobilinogen
- Serum ceruloplasmin
- Chest X-ray
- ECG
- EEG
- CT/MRI

Per History Consider Additional Tests

- Skulls films
- Blood alcohol level or breathalyzer
- Heavy metal screen
- Medication levels
- Antinuclear antibodies
- Lumbar puncture
- serum and urine copper
- Monospot
- Skin test for TB or brucellosis
- Pregnancy test
- Stool test for occult blood
- ABG's

Medical Disorders That can Induce Psychiatric Symptoms

Endocrine	Metabolic Endocrine	Infectious	Connective Tissue	CNS
Thyroid disorder • Hyper- • Hypo- Adrenal disorder • Hyper • Hypo- • Pheo Parathyroid DO Pancreatic DO • Hyperglycemia • Hypoglycemia	Hepatic disorder • Wilson's • Encephalopathy Porphyria Vitamin def • B-12 • B-1 Electrolyte imbalances	HIV Neurocystercercosis PANDAS Neuroborrilosis Neurosyphilis Herpes Pneumonia UTI Sepsis Malaria Legionnaire disease Typhoid Diphtheria Rheumatic fever	SLE Fibromyalgia Multiple Sclerosis	Dementia Delirium Seizure DO (e.g., TLE) NPH Subdural hematoma Tumor Meningitis Encephalitis

Medical Disorders That can Induce Psychiatric Symptoms

Rx and Toxins	Examples
Prescription drugs	Chemotherapeutic Rx's • Immunosuppressants (e.g., cyclosporin) • Antiviral Rx's (e.g., interferon) • Antiparkinsonian Rx's • Cardiovascular Rx's • Thyroid Rx's • Anticholinergic Rx's • Corticosteroids • Psychostimulants • Sympathomimetics • Sedative & CNS-depressants (e.g., barbiturates, benzodiazepines) • Opioids

Medical Disorders That can Induce Psychiatric Symptoms

Rx and Toxin	Examples
Substances of Abuse	Alcohol • Cocaine • Marijuana • PCP • LSD • Heroin • Amphetamines • Jimson weed • GHB

Endocrine Disorders

Endocrine Disorders Presenting With Psychiatric Symptoms

- Hypothyroidism (myxedema madness)
  - Hypothyroidism associated with rapid onset may clinically present with delirium and psychosis
  - In the elderly may present like dementia-like symptoms
  - Subclincal hypothyroidism can be virtually indistinguishable from depression
  - Characterized by depression, anxiety, cognitive impairment
  - Other symptoms include fatigue, weight gain, memory loss

    The above make hypothyroid look like a mood disorder

Endocrine Disorders Presenting With Psychiatric Symptoms

- Hyperthyroidism (Graves disease)
  - Can present with either depression or anxiety
  - May be misdiagnosed as either mood disorder or anxiety disorder
  - May even look like CNS-intoxication
  - Associated symptoms:
    - Weight loss despite increased PO consumption
    - Heat intolerance
    - Diaphoresis
    - Warm skin
    - Proptosis
  - In elderly can present as apathetic hyperthyroidism—a form that presents with psychomotor retardation and cognitive deficits, often misdiagnosed as "apathetic depression"
  - Hyperthyroidism can also lead to mania in bipolar patients

Endocrine Disorders Presenting With Psychiatric Symptoms

- Hypoadrenalism
  - 1ry = Addison's disease
    - Causes: TB of adrenal gland; adrenoleukodystrophy; amyloidosis; drugs (e.g., ketoconazole, metyrapone); hemochromatosis; HIV; sarcoidosis; metastases; bilateral adrenalectomy)
  - 2 ry = ACTH Deficiency Hypoadrenalism (usually caused by disease of the pituitary gland, which leads to adrenal failure as 2ry effect)
    - Causes: exogenous synthetic steroid use; diseases of pituitary gland

Endocrine Disorders Presenting With Psychiatric Symptoms

- Hypoadrenalism (Addison's Disease)
  - Can be easily confused for depression
  - Presenting symptoms:
    - Fatigue
    - Weight loss
    - Anorexia (may be confused with anorexia nervosa)
    - Hyperpigmentation of skin (especially oral mucosa) be a tip-off
    - Hypotension
    - Vomiting
    - Nausea

Endocrine Disorders Presenting With Psychiatric Symptoms

- Hypoadrenalism (Addison's Disease)
  - Diagnosis:
    - Hyperpigmentation
    - Hypotension (SBP usually <110mg)
    - Postural hypotension
    - Lab tests:
      - ↓ cortisol (usually <200nmol)
      - ↓ NA+
      - CBC: eosinophilia
      - ↑ ACTH (usually > 80ng/l)
      - ↑ K+
  - Treatment:
    - Oral hydrocortisone (blood level goal: 1000nmol/l in AM; 100 – 300 nmo;/l in PM)

Endocrine Disorders Presenting With Psychiatric Symptoms

- Hyperadrenalism (Cushing's Disease)
  - Presents with Sx's characteristic of depression in about ½ of patients
    - Characterized by fatigue, weight gain, mood lability, decreased concentration, depressed mood, decreased libido, and sleep disturbances
  - Presenting physical symptoms:
    - Truncal obesity
    - HTN
    - Acne
    - Hirsutism
    - Hyperglycemia
    - Abdominal striae
    - Proximal muscle weakness

Endocrine Disorders Presenting With Psychiatric Symptoms

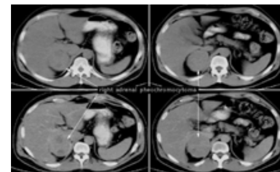
- Hyperadrenalism (Cushing's Disease)
  - Causes:
    - Pituitary adenomas
    - Ectopic ACTH Syndrome (e.g., lung CA)
    - Adrenal tumors
  - Diagnosis:
    - 24-hr Urinary Free Cortisol Level (>100 mcg/24)
    - Dexamethasone Suppression Test
    - CRH Stimulation Test
      - Both test above help differentiate excess ACTH production due to pituitary adenomas vs ectopic ACTH-producing tumor

Endocrine Disorders Presenting With Psychiatric Symptoms

- Pheochromocytoma
  - Catecholamine releasing tumors of the adrenal medulla
  - Presents with Sx's characteristic of anxiety disorders:
    - Often paroxysmal attacks of anxiety that resemble "panic attacks"
  - Presenting physical symptoms:
    - ↑HR
    - Diaphoresis
    - When a good history is taken the anxiety attacks caused by pheochromocytomas will not meet the diagnostic criteria for panic attacks
      - Absence of phobic avoidance

Endocrine Disorders Presenting With Psychiatric Symptoms

- Pheochromocytoma
  - Diagnosis:
    - Plasma catecholamines & metanephrines
    - 24-hr urinary catecholamines & metanephrines
    - CT or T-2 weighted MRI of head, neck & chest
    - Clonidine-suppression test
    - Adrenal gland pressure—will cause a burst of catecholamines which will quickly reproduce the symptoms
  - Treatment:
    - Surgical resection of tumor
      - Pre-tx with phenoxybenzamine (an irreversible B-blocker) or labetolol (combined alpha/beta blocker) to prevent intraoperative HTN



Endocrine Disorders Presenting With Psychiatric Symptoms

- Hyperparathyroidism

  "Bones, stones, groans and psychic moans"
  - Usually caused by a parathyroid adenoma
  - Characterized by:
    - Hypercalcemia that can lead to confusion, psychosis and delirium at very high levels
    - At lower levels more usual symptoms are depressed mood, decreased memory, loss of appetite, decreased concentration, fatigue
    - Tell-tale symptoms:
      - GI symptoms (anorexia)
      - Muscle weakness (and restless leg syndrome)
      - Renal stones
      - Bone/joint changes or pain

Endocrine Disorders Presenting With Psychiatric Symptoms

- Hyperparathyroidism
  - Diagnosis:
    - Parathyroid hormone blood level
    - Calcium blood level
    - Bone density measurement test
    - Abdominal imaging may reveal the presence of kidney stones
  - Treatment:
    - Surgical removal

Endocrine Disorders Presenting With Psychiatric Symptoms

- Hypoparathyroidism
  - Psychiatric presentations may include:
    - Depression
    - Anxiety
    - Irritability with severe cognitive impairment
      - Onset of psychiatric symptoms may precede physical manifestations
  - Physical symptoms may include:
    - Tetany and seizures from hypocalcemia
    - Neuropsychiatric symptoms (weakness, fatigue and slowed cognition) caused by hypomagnesemia mediated inhibition of PTH release

Endocrine Disorders Presenting With Psychiatric Symptoms

- Hypoparathyroidism
  - Diagnosis:
    - Low serum calcium level
    - High serum phosphorus level
    - Low serum parathyroid hormone level
    - Low serum magnesium level (possible)
    - Abnormal heart rhythms on ECG (possible)
  - Treatment:
    - Oral calcium carbonate
    - Vitamin D supplement

Endocrine Disorders Presenting With Psychiatric Symptoms

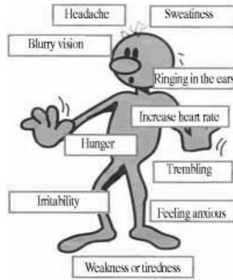
- Diabetes Mellitus/Hypoglycemia
  - Early in its course initial symptoms (e.g., fatigue & weight gain) may be confused with psychiatric disorders
  - Hypoglycemia can cause profound decease in cognitive functioning—especially associative learning, attention, mental flexibility
  - Acute hypoglycemia can cause anxiety

Endocrine Disorders Presenting With Psychiatric Symptoms

- Diabetes Mellitus/Hypoglycemia (cont.)
  - Differential diagnosis of hypoglycemia include:
    - Alcohol use
    - Fasting
    - Insulinoma
    - Factitious hypoglycemia
  - Psychiatric symptoms (e.g., psychosis or mood changes) occur in up to 80% of patients with insulinomas. Suspect if symptoms are episodic and relieved by food intake
  - Factitious hypoglycemia can be uncovered by measurement of C-peptide if suspected

Endocrine Disorders Presenting With Psychiatric Symptoms

- Hypoglycemia (low blood sugar)
  - Symptoms can be variable and include delirium or coma
  - Can include palpitations, sweating, anxiety, tremor, vomiting
  - If in doubt, give candy or orange juice sweetened with sugar
  - In an emergency room, give 50 cc. of 50% dextrose for both treatment and diagnosis



Metabolic Disorders

Metabolic Disorders Presenting With Psychiatric Symptoms

- Wilson's Disease
  - Also called hepatolenticular degeneration
  - Prevalence is 1 per 30,000 live births
  - An autosomal recessive disorder of copper metabolism, with associated decrease transport of copper from the liver into bile, leading to accumulation of copper in the organism, primarily liver
    - In acute liver injury copper may be released in the blood and cause hemolytic anemia
    - In chronic cases, the copper accumulates in the brain and cause neuropsychiatric symptoms

Metabolic Disorders Presenting With Psychiatric Symptoms

- Wilson's disease
  - Usual presentation: movement disorder, psychosis, and personality changes around the second to third decades
    - 35% of patients present with neurological symptoms: Parkinsonian-like tremor, rigidity, clumsiness of gait, slurring of speech, inappropriate and uncontrollable grinning, and drooling

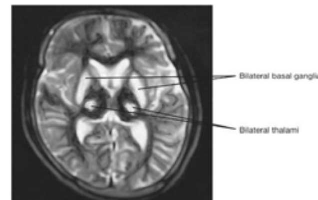
Metabolic Disorders Presenting With Psychiatric Symptoms

- Wilson's disease (cont.)
  - Three subgroups of brain disease: (Oder 1993)
    - Bradykinesia, rigidity, cognitive impairment, and organic mood syndrome were associated with dilatation of 3rd ventricle
    - Ataxia and tremor were associated with focal thalamic lesions
    - Dyskinesia, dysarthria, and organic personality syndrome were associated with lesions in putamen and palladium
  - 10% present with psychiatric problems ranging from subtle personality changes to overt depression, paranoia and catatonia

Metabolic Disorders Presenting With Psychiatric Symptoms

Wilson's Disease

- Clues to diagnosis:
  1) Kayser-Fleischer rings* adjacent to the cornea during slit-lamp examination
  2) 24 hour collection—increased urine copper, decreased serum copper and low serum ceruloplasm (<20mg/dl)
  3) Increased amounts of liver and urinary cooper
  4) Elevated concentrations of copper in the CSF: ↑ 3-4 fold
  5) Imaging study: MRI*: Showing hyperintensities in the bilateral basal ganglia and thalami shown by T2-weighted MRI of the brain



Metabolic Disorders Presenting With Psychiatric Symptoms

Wilson's Disease

- Treatment
  - Once diagnosis is confirmed, treatment should start as soon as possible, either in symptomatic or asymptomatic patients
  - Penicillamine 500mg2 PO is the drug of choice
    - Response is quite slow and takes one year to maximum effect
    - Neurologic symptoms may worse in the first months of treatment
    - Penicillamine treatment should be lifelong
    - Prednisone, 20 mg orally, is usually required to treat adverse drug reactions
    - Acute liver injury may not respond to therapy and require liver transplantation
  - Trientine or zinc are alternatives to penicillamine
    - They work by blocking the absorption of copper and increases copper excretion in the stool[1]

[1]Brewer 1998

Metabolic Disorders Presenting With Psychiatric Symptoms

Porphyria

- An autosomal dominant disorder resulting from a partial deficiency of porphobilmogen deaminase (PBGD), an enzyme required in heme biosynthesis pathway
- Acute intermittent porphyria (AIP) can be associated with psychiatric symptoms (e.g., psychosis) even when physical manifestations (abdominal pain, neuropathy, autonomic dysfunction) are not present
- 90% of individuals remain biochemically and clinically normal throughout life. However, clinical expression of the disease is usually linked to factors that stimulate or depresses the activity of nonspecific delta-aminolevulinic acid synthase in the liver. This can be environmental such as nutritional status, drugs, steroids and other chemicals

Metabolic Disorders Presenting With Psychiatric Symptoms

Porphyria (Cont.)

- Often presents after puberty and more commonly in women
- Most common presenting complains are abdominal pain and other GI distress. Urinary incontinence is also common
- Other symptoms include: tachycardia, HTN, fever, sweating, restlessness and tremor

Metabolic Disorders Presenting With Psychiatric Symptoms

Acute Porphyria

- Attacks: Clinical features
  - Early sx's: minor behavioral changes: Anxiety, restlessness & insomnia
  - Autonomic neuropathy
    - Gastrointestinal
      - Abdominal pain: Opiate treatment
      - Vomiting: Chlorpromazine treatment
      - Constipation: Lactulose treatment
    - Pain: Back; Extremities
    - Cardiovascular
      - Hypertension; Tachycardia—Treat with β-blockers

Metabolic Disorders Presenting With Psychiatric Symptoms

Acute Porphyria

- Attacks: Clinical features (cont.)
  - Motor-Sensory neuropathy
    - Weakness: May be diffuse; Respiratory involvement in some cases
    - Sensory loss: Distal
    - Tendon reflexes: Reduced
  - CNS: Rule out hyponatremia
    - Seizures
    - Confusion

Metabolic Disorders Presenting With Psychiatric Symptoms

- Acute porphyria
  - Attacks: Clinical features
    - Psychiatric symptoms:
      - Hysteria
      - Anxiety
      - Apathy or depression
      - Phobias
      - Psychosis
      - Agitation
      - Mania-like states
      - Delirium

Metabolic Disorders Presenting With Psychiatric Symptoms

- Porphyria
  - Diagnosis:
    1. Predominantly Neurological Symptoms:
       a. Urinary delta-aminolevulinic acid
       b. Urinary porphobilinogen
       c. Total urinary porphyrin
       These are high during psychosis and less so during asymptomatic periods
    2. Predominantly Cutaneous Symptoms:
       a. Total plasma porphyrins

Metabolic Disorders Presenting With Psychiatric Symptoms

- Porphyria
  - Treatment:
    1. During acute attack:
       i. Stop alcohol and tobacco
       ii. Treat infections and electrolyte imbalances
       iii. IV heme
       iv. Treat with IV glucose/CHO
       v. If carbohydrates do not work or there is evidence of bulbar paralysis, then use IV heme preparations with hemin (3-4 mg/kg IV over 10-15 minutes per day x >4 days) or heme arginate. Blood and urine levels of delta-aminolevulinic acid and porphobilinogen are promptly lowered and symptoms improve, usually within several days
          - Heme arginate or Hematin
          - Dose: 3 mg/kg per day for 3–4 consecutive days
          - Side effects: Thrombophlebitis, Coagulopathy & Anaphylactic reactions

Metabolic Disorders Presenting With Psychiatric Symptoms

Vitamin B12 (Cobalamin) Deficiency

- Usually caused by pernicious anemia
- B12 is obtained in the diet from animal sources, leaving vegans susceptible to depletion; Normally it takes months to years to deplete stores
- B12 deficiency is a common cause of macrocytic anemia
- Neurological symptoms:
  - Memory loss
  - Irritability
  - Dementia
  - Are caused by demyelination, leading to degeneration of lateral and posterior columns

Metabolic Disorders Presenting With Psychiatric Symptoms

Vitamin B12 (Cobalamin) Deficiency (cont.)

- Diagnosis:
  - Test for B12 deficiency with red cell folate, serum B12, methylmalonic acid levels or homocysteine levels
  - Use of the Schilling test for detection of pernicious anemia has been supplanted for the most part by serologic testing for parietal cell and intrinsic factor antibodies
- Treatment:
  - Supplementation with oral vitamin B12 is a safe and effective treatment for the B12 deficiency state

Metabolic Disorders Presenting With Psychiatric Symptoms

- Thiamine deficiency (B1)
  - Thiamine (B1) is an essential co-enzyme in neural function and carbohydrate metabolism
  - Commonly associated with chronic alcohol intake
  - Nevertheless, a significant percentage of cases (23%) are caused by disorders other than alcoholism: hyperemesis, starvation, dialysis, malignancy, AIDS
  - Diagnosis:
    - Can detect thiamine deficiency with erythrocyte thiamine transketolase
  - Wernicke's-Korsakoff's Syndrome = 2 states:
    - Acute Wernicke's encephalopathy
    - Chronic Korsakoff's disorder (KD) or Alcohol Amnesic Disorder

Metabolic Disorders Presenting With Psychiatric Symptoms

- Thiamine deficiency (B1)
  - Wernicke's Encephalopathy
    - Represents a true medical emergency
    - Presentation is usually acute
    - Worsened/precipitated by the addition of carbohydrates
    - Caused by atrophy of mamillary bodies, visible on head MRI
    - *Diagnostic triad:*
      - Ophthalmoplegia (nystagmus, abducens nerve paresis, conjugate gaze paresis)
      - Ataxia
      - (stance, gait)
      - Confusion/Encephalopathy (global, listlessness, inattentiveness, ↓ concentration, disorientation, indifference, and inattention)
    - *Treatment:*
      - Best treatment is prevention: Adequate diet/nutrition
      - Thiamine supplementation:
        100 mg IV prior to carbohydrate loading
        100 mg PO q D

Metabolic Disorders Presenting With Psychiatric Symptoms

- Thiamine deficiency (B1)
  - Korsakoff's Disorder = Alcohol Amnesic disorder
    - Characterized by selective anterograde and retrograde amnesia, leading to confabulation
    - Onset: usually after years of heavy etoh use; most pts >40 y/o
    - Prognosis: poor, once established it usually persists indefinitely, < 20% recovery

Metabolic Disorders Presenting With Psychiatric Symptoms

- Thiamine deficiency (B1)
  - Korsakoff's Disorder = Alcohol Amnesic disorder
    - Disease course:
      - Begins with a global confusional state (patient appears apathetic, slow, oblivious to their surroundings, prominent memory impairment)
      - Followed by a period of alertness, jovial attitude, but persistent retrograde and anterograde amnesia
      - Eventually, the amnesia impairs memory-based cognitive functions, especially learning

Metabolic Disorders Presenting With Psychiatric Symptoms

- Thiamine deficiency (B1) (cont.)
  - Korsakoff's Disorder = Alcohol Amnesic disorder
    - Diagnosis:
      - CT, MRI: normal or some degree of cerebral atrophy
      - EEG: normal
      - Pathology: petechial hemorrhages in mamillary bodies, structures surrounding 3rd ventricle & aqueduct of Sylvius (i.e., limbic system)
    - ≠ Alcoholic Dementia: most likely the result of multiple factors: WKS, contusions, hematomas, TBI, hepatic encephalopathy, hydrocephalus

Wernicke-Korsakoff Syndrome

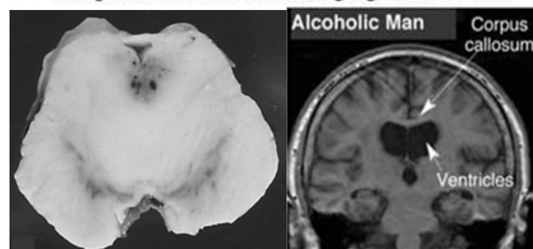


Image courtesy of the National Institute on Drug Abuse

Infectious Diseases

Infectious Disorders Presenting With Psychiatric Symptoms

- Mild Neurocognitive Disorder (MND)
  - 20-30% of asymptomatic or early symptomatic seropositive persons will have mild-neurocognitive disorder (MND)
    - MND may predispose toward frank dementia
  - 50% of persons with AIDS have neuropsychiatric deficits
  - Prevalence of dementia in AIDS patients is variable (15-66%)
  - Annual Incidence of dementia in AIDS is 14%
  - 75% of AIDS patients die within 6 months of the diagnosis of dementia

Infectious Disorders Presenting With Psychiatric Symptoms

- HIV Associated Dementia (HAD)
  - HAD affects 14% of patients with HIV
  - Incidence has decreased with the introduction of HAART
  - Characterized by the following symptoms:
    - Motor Symptoms:
      - Frontal release signs
      - Exaggerated DTR's
      - Disturbed smooth eye movements
      - Decreased coordination
      - Motor weakness
      - Decreased capacity to perform rapid-alternating movements
      - Late: unresponsiveness, urinary/ fecal incontinence, mutism
    - Cognitive symptoms:
      - Impaired short term memory
      - Reduced concentration
      - Lower extremity weakness
      - Behavioral changes (e.g., apathy and social withdrawal)

Infectious Disorders Presenting With Psychiatric Symptoms

- HIV Associated Dementia (HAD)
  - HIV-associated dementia classification system:
    - Stage 0: Normal
    - Stage 0.5: Subclinical or Equivocal
      - Minimal or equivocal symptoms
      - Mild (soft) neurological signs
      - No impairment of work or activities of daily living (ADL)
    - Stage 1: Mild
      - Unequivocal intellectual or motor impairment.
      - Able to do all but the most demanding work or ADL

Infectious Disorders Presenting With Psychiatric Symptoms

- HIV Associated Dementia (HAD)
  - HIV-associated dementia classification system: (cont.)
    - Stage 2: Moderate
      - Cannot work or perform demanding ADL
      - Capable of self-care
      - Ambulatory, but may need a single prop
    - Stage 3: Severe
      - Major intellectual disability
      - Cannot walk unassisted
    - Stage 4: End-Stage
      - Nearly vegetative

Infectious Disorders Presenting With Psychiatric Symptoms

- HIV Associated Dementia (HAD)
  - Diagnostic Laboratory Tests:
    - MMSE scores usually in mid-20's
    - CT scan: white matter lucencies
    - T2-weighted MRI: areas of high signal output
    - Abnormal EEG
    - Ophthalmology exam reveals cotton wool spots on retina
    - Decreased CD4, high serum and CSF Beta-2 microglobulin, increased CSF neopterin and quinolinic acid

Infectious Disorders Presenting With Psychiatric Symptoms

- Neurocystercercosis
  - Caused by the larval form of *Tenia Solium* (pork tapeworm)
  - Humans are the definitive host for this worm acquired by ingestion of the egg form by auto-infection or consumption of contaminated food
  - Neurocystercercosis presents with seizures, psychosis or depression
  - Patients tend to be younger, present with acute onset of symptoms, and usually have no prior psychiatric history
  - Diagnostic clues:
    - Travel history, country of origin and proximity to livestock may aid in diagnosis

Infectious Disorders Presenting With Psychiatric Symptoms

- PANDAS
- Characterized by childhood obsessive compulsive disorder occurring earlier than usual and usually has an abrupt onset with relapsing-remitting course
  - Pathogenesis is thought to involve anti-strep antibodies that cross-react with epitomes in the basal ganglia
  - Disorder is related to the classic Sydenham's chorea, but PANDAS has more behavioral components; while Sydenham's chorea has more movement disorder symptoms than PANDAS
  - Treatment consists of immunotherapy

PANDAS = Pediatric autoimmune neuropsychiatric disorder associated with streptococcus infection

Infectious Disorders Presenting With Psychiatric Symptoms

- Neuroborrilosis: CNS-Lyme Disease
  - Caused by infection by the tick borne spirochete *Borrelia Burgdorfori*
  - 3% risk of acquiring Lyme disease with each tick bite
  - *Erythema migrans:* characteristic rash
  - Diagnosis:
    - Exposure history
    - *Erythema migrans* rash
    - Serological evidence and 1 out of 3:
      1) Arthritis
      2) Neurological symptoms (cranial or peripheral neuropathy, meningitis, encephalomyelitis, encephalitis)
      3) Cardiac conduction defects

Infectious Disorders Presenting With Psychiatric Symptoms

- Neuroborrilosis: CNS-Lyme Disease
  - Disease presentation:
    - Acute Symptoms:
      - 1st month after infection patients may complain of headache, fatigue, and myalgias
    - Chronic physical symptoms:
      - Arthritis, carditis with conduction defects, and CNS symptoms like Bell's Palsy (in up to 10% of patents)

Infectious Disorders Presenting With Psychiatric Symptoms

- Neuroborrilosis: CNS-Lyme Disease
  - Disease presentation: (cont.)
    - Neurological symptoms/meningoencephalitis:
      - Cognitive dysfunction: difficulty with concentration confusion, memory difficulties. Day time hypersomnolence, myoclonus, apraxia, ataxia, paresthesias, seizures and/or irritability. These patients are initially misdiagnosed as suffering from MS

Infectious Disorders Presenting With Psychiatric Symptoms

- Neuroborrilosis: CNS-Lyme Disease
  - Disease presentation: (cont.)
    - Psychiatric symptoms:
      - More commonly depression
      - Less common: panic attacks, transient paranoia, illusions or hallucinations, anorexia, depersonalization, violent outburst, OCD, agitated mania, sensitivity to light or sound, personality change

Infectious Disorders Presenting With Psychiatric Symptoms

- Neuroborrilosis: CNS-Lyme Disease
  - Differential diagnosis:
    - (For neurological symptoms) MS, fibromyalgia, chronic fatigue syndrome, other infections
    - Somatization disorder (due to multiple vague somatic complaints)
  - Clue to diagnosis:
    1. Serologic studies with ELISA and Western Blot or PCR for borrelial DNA
    2. These serologic studies may be equivocal
    3. Late stage CSF may be normal
    4. MRJ may show demyelinating disorder
    5. EEG is usually normal
    6. PET is helpful because it shows global or heterogeneous hypoperrasion

Infectious Disorders Presenting With Psychiatric Symptoms

- Neuroborrilosis: CNS-Lyme disease
  - Rx:
    - w/o CNS involvement:
      - 3-4 weeks of Vibramycin (100 mg BID), amoxicillin (500 mg BID), or Ceftin 500 mg BID
    - w/ CNS involvement: 4-6 wks of IV veftriaxone (2 g QD) or Cefotaxime (2 g Q8)
    - Vaccine was introduced in 1999 with 50-75% of effectiveness

Infectious Disorders Presenting With Psychiatric Symptoms

- Neurosyphilis
  - Caused by *Treponema Pallidium*
  - In the late stages of syphilis spirochetes invade the meninges
    - Patients with syphilis are more likely to develop neurosyphilis if *T. Pallidium* is found in the CSF 5 years after primary infection
  - Presentation:
    - Progressive changes in personality that may involve delusions of grandeur, emotional lability or paranoia
    - Neuropsychiatric symptoms: memory loss, carelessness, dementia, depression or seizures
    - It is important to check for HIV status in patients with syphilis because there is significant comorbidity between these 2 infections

Infectious Disorders Presenting With Psychiatric Symptoms

- Syphilis
  - Primary syphilis:
    - Lesion at site of infection within 2-3 weeks
  - Secondary syphilis:
    - Recurrent rash with onset 6 weeks to 6 months after initial exposure. There is a latent stage for 2-10 years
  - Tertiary syphilis:
    - Involves the skin, bone, aorta and CNS

Infectious Disorders Presenting With Psychiatric Symptoms

- Neurosyphilis is divided in four stages:
  1. Asymptomatic with abnormal CSF
  2. Meningovascular syphilis characterized by headache, nuchal rigidity, irritability and delirium
  3. Tabes dorsalis with posterior column degeneration such as ataxia, areflexia, paraesthesias, incontinence, impotence and Argyll Robertson pupil
  4. General Paresis or paralysis of the insane, dementia paralytica
     - A general change in personality is usually seen with apathy, lability, paranoia and coarsening of behavior
     - Dementia involves prominent impairment of memory, language, and loss of initiative and psychomotor slowing

Infectious Disorders Presenting With Psychiatric Symptoms

- Neurosyphilis:
  - Clues to diagnosis:
    1. Abnormal CSF with elevated lymphocytes and or protein
    2. CSF VDRL is positive in only 27-92%

       *Treponemal tests are not standardized for diagnostic use on CSF and should not be used as confirmation of neurosyphilis[1]
    3. Serum tests:
       - Rapid Plasma Reagin test (RPR) or venereal disease research laboratories (VDRL)
       - If positive, then follow up with fluorescent treponemal antibody absorption tests (FTA-ABS)
    4. Signs of tertiary syphilis
    5. MRI or CT may show evidence of organic brain disease

[1]Davis, 1989

Infectious Disorders Presenting With Psychiatric Symptoms

- Neurosyphilis—Clues to diagnosis:
  5. MRI or CT may show evidence of organic brain disease

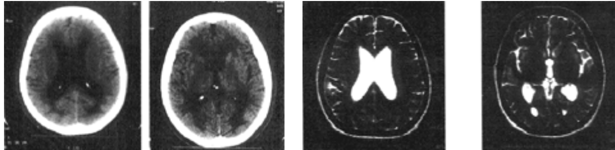


Figure 1. Computed tomography of brain shows (left) prominence of temporal horns and (right) enlargement of lateral and third ventricles

Figure 2. Magnetic resonance imaging of brain shows (left) slightly enlarged lateral ventricles and (right) increased signal in medial portion of temporal lobes involving hippocampal gyri

South Med J, 2002 Southern Medical Association

Infectious Disorders Presenting With Psychiatric Symptoms

- Neurosyphilis:
  - Rx:
    1. Benzathine Penicillin results in no measurable CSF levels
    2. IV penicillin G (3-4 million units IV q4 for 10-14 days. This requires hospitalization
    3. If allergic to PCN, use ceftriazone Ig IV QD for 10 days

Infectious Disorders Presenting With Psychiatric Symptoms

- Herpes Encephalitis
  - Characterized by abrupt onset of fever, personality change, headaches, followed by cognitive changes and focal neurological signs such as aphasia, visual field deficits, hemiparesis or partial seizures
  - Neuropsychiatric symptoms:
    - Initially presents with hallucinations, memory loss, or behavioral disturbances
    - The disease is rapidly progressive resulting in refractory seizures, coma and death within 2 weeks
    - Survivors may exhibit postencephalitic symptoms of amnesias, aphasia and Kluver-Bucy syndrome or dementia

Infectious Disorders Presenting With Psychiatric Symptoms

- Herpes Encephalitis
  - Clue to diagnosis:
    1. CSF shows leukocytosis, moderate protein elevation and a normal or depressed glucose. PCR analysis will detect HSV DNA
    2. 80% of pts with biopsy-proven herpes simplex encephalitis will have focal EEG abnormalities showing: slowing or repetitive epileptiform discharges in the frontotemporal area
    3. Brain MRI
  - Rx:
    - Acyclovir and Vidarbine (Vira-A)
    - Even with treatment, fewer than 40% will survive with minimal or no sequelae
    - If untreated: 40-70% mortality

Clinical Case

- 28 y/o man presents to the ED with high fever; progressive, severe, generalized throbbing headache; blurred vision; and increasing confusion. These symptoms started 3 days ago
- History:
  - The patient had previously been healthy and active; he works in the oil fields
  - He is married and does not smoke, drink alcohol or use illicit drugs
  - He has had no blood transfusions and takes no medications

Clinical Case (Cont.)

- Examination:
  - Well-built man ill-appearing
  - Pulse rate is 110 bpm; temp 38.3'C (101'F); rr 22bpm; BP 116/72mmHg
  - He is well hydrated. No scleral icterus or oral candidal infection. Pupils are equal and reactive. No palpable adenopathy or rashes
  - The patient is confused; disoriented to person, time and place; and agitated. Cranial nerves are intact. Fundi are normal. He can move all his limbs. DTR's are normal; plantar reflexes are equivocal. Neck is supple. Remainder of the examination is normal

Clinical Case (Cont.)

- Laboratory studies:
  - WBC 18,000uL, with 70% polymorphonuclear neutrophils and 30% lymphocytes. Hgb 13.1g/dl; platelets count 20,000/uL; ESR 90mm/h. Serum sodium 138mEq/L; potassium 4mEq/L; chloride 102mEq/L; Calcium 9.2mg/dL; blood glucose 101mg/dL; blood urea nitrogen 29mg/dL; serum creatinine 1mg/dL; total bilirubin 1mg/dL; aspartate aminotransferase 22U/L; alkaline phosphatase 112U/L. results of coccidial serologic testing and drug screening are negative. Urinalysis results are normal
  - CSF pressure is increased. CSF protein level is 180mg/dL; glucose 92; WBC 116/uL; RBC 80/uL. Gram staining of CSF shown WBC's but no organism
- You order an MRI of the brain

Connective Tissue Disorders

Connective Tissue Disorders Presenting With Psychiatric Symptoms

- Systemic Lupus Erythematosus
  - SLE is a connective tissue disease of unclear etiology that is characterized by recurrent episodes of destructive inflammation of several organs including the skin, joints, kidneys, blood vessels and CNS
  - Presentation:
    - Primary psychiatric disturbances:
      - Psychosis
      - Cognitive defects
      - Dementia

Connective Tissue Disorders Presenting With Psychiatric Symptoms

- Systemic Lupus Erythematosus
  - Psychosis 2ry to Lupus Cerebritis:
    - 5% of SLE pts usually within the first 2 years
    - Characterized by bizarre thinking with delusions or hallucinations, poor attention span, easy distraction, misinterpretation of surroundings agitation, combative behavior, and "clouding of consciousness"
      - Auditory hallucinations are usually caused by steroid therapy
      - Visual and tactile hallucinations are frequently due to SLE
    - Rx:
      - Response to steroids—prednisone 1-2 mg/kg/day. If no improvement is seen then switch to cytotoxic therapy – cyclophosphamide[1]
      - While waiting for effects of therapy, treat with antipsychotics—haloperidol

[1]Neuwelt 1995

Connective Tissue Disorders Presenting With Psychiatric Symptoms

- Systemic Lupus Erythematosus
  - Cognitive Dysfunction:
    - 21-80% of SLE patients presents with difficulty in short or long term memory, impaired judgment and abstract thinking, aphasia, apraxia, agnosia and personality changes[1]
    - Cognitive dysfunction appears to be evanescent and is not directly correlated with active disease or corticosteroid therapy
    - Impaired remote memory appears to be associated with a history of past CNS involvement vs. impaired immediate memory and concentration implies increased disease activity
  - Dementia:
    - Characterized by severe cognitive dysfunction occurs in pts with lupus that have had multiple small ischemic strokes caused by antiphospholipid antibodies and is usually worsened by high dose corticosteroids

[1]Hay 1994

Connective Tissue Disorders Presenting With Psychiatric Symptoms

- Systemic Lupus Erythematosus
  - Secondary psychiatric disturbance:
    - Depression, anxiety, and manic behavior are more typically functional[1]
      - Depression: usually begins acutely and reflects the pt's reaction to chronic illness and lifestyle limitations including difficulty with pregnancy, fatigue, decreased sun exposure, and chronic medication use
      - Anxiety: pts may be anxious about consequences of their illness including disfigurement, disability, dependency, loss of a job, social isolation and death. May be manifested in panic attacks
      - Mania: usually associated with corticosteroids
    - Steroids cause hypomanic symptoms in 30% of patients who take them while depressive symptoms are seen in 10% of patients

[1]Jennekens 2002

Connective Tissue Disorders Presenting With Psychiatric Symptoms

- Fibromyalgia
  - Fibromyalgia is a non specific disorder characterized by many diffuse complaints including pain, stiffness, tender muscles and joints, overwhelming fatigue, distress and sleep disturbances
  - Criteria for classification of fibromyalgia:
    - A. Widespread pain—present for 3 months
    - B. Presence of 11 of 18 tender points—bilateral sites of occiput, lower cervical, trapezius, supraspmatus, second rib, lateral epicondyle, gluteal, greater trochanter, and knees
    - Additional features include: sleep disturbance, fatigue, complaints of weakness, headaches, cold sensitivity, paresthesia or dysesthesia, swellings, Raynaud's phenomena, restless legs, exercise intolerance, and irritable bowel and bladder

Connective Tissue Disorders Presenting With Psychiatric Symptoms

- Fibromyalgia
  - Differential Diagnosis: dysthymic disorder, GAD, somatization, and chronic pain syndrome
  - Psychological abnormalities such as depression, anxiety, and chronic pain with functional disability may develop on patients with fibromyalgia
    - 25% of patients diagnosed with fibromyalgia have major depression
    - 50% of patients with fibromyalgia have a lifetime history of major depressive episodes
    - Many of the symptoms of fibromyalgia overlap with major depression including fatigue, lack of energy, and sleep disturbances

Connective Tissue Disorders Presenting With Psychiatric Symptoms

- Fibromyalgia
  - No laboratory data including serological studies, EMG, muscle or nerve biopsies exist to confirm diagnosis
  - Goldenberg et al. found that the Minnesota Multiphase Personality Inventory-2 show elevations in hypochondriacal and hysteria subscales similar to those of other chronic pain patients
  - Rx:
    - No single medical or psychiatric intervention has been effective
    - Current approach is supportive counseling, behavioral modification, education, physical conditioning and limited pharmacological intervention
    - There have been no conclusive medication trial

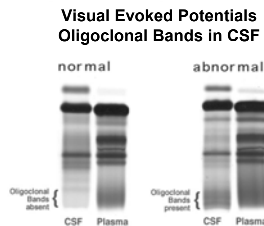
Connective Tissue Disorders Presenting With Psychiatric Symptoms

- Multiple Sclerosis
  - MS is a demyelinating disease that affects around 250,000 people in the U.S.
  - First described by Jean-Marie Charcot
    - Charcot's Triad: (Nystagmus, Intention Tremor & Scanning Speech).
  - Epidemiology:
    - 2:1 women to men ratio
    - Most prevalent among whites of northern European descent
    - Prevalence increases with distance from the equator
  - Disease Course:
    - Usually has relapsing-remitting course
    - Two types: benign and chronic progressive types

Connective Tissue Disorders Presenting With Psychiatric Symptoms

- Multiple Sclerosis
  - Diagnosis:
    - Neurologic examination
    - Head & Spine MRI = "MS plaques" in T2-weighted & FLAIR sequences
    - Sensory Evoked Potential Testing (visual, brainstem auditory and somatosensory)
    - Cerebrospinal Fluid (CSF) Analysis: CSF IgG concentration is increased relative to other CSF proteins (e.g., albumin), and CSF gel electrophoresis reveals oligoclonal bands in 90% of cases

Visual Evoked Potentials
Oligoclonal Bands in CSF



Connective Tissue Disorders Presenting With Psychiatric Symptoms

- Multiple Sclerosis
  - Psychiatric Presentations:
    - Charcot noted psychiatric symptoms of depression, pathological laughter, and "stupid indifference"

    1. Depression:
       - Depression rates range from 45-62% ? cerebral involvement vs. psychological reaction to living with a debilitating and chronic illness[1, 2]
       - Higher rates of depression when compared to patients with other chronic illness supports the cerebral demyelination theory
       - Cerebral involvement is more closely related to depression in MS than is spinal cord involvement
       - Depression in MS is unrelated to neurological status and degree of cognitive impairment

[1]Diaz-Olavarrieta 1999; [2]Nyenhuis 1995—psychological rxn

Connective Tissue Disorders Presenting With Psychiatric Symptoms

- Multiple Sclerosis
  - Psychiatric Presentations:

    2. Pathological laughter:
       - Associated with pseudobulbar palsy, or bilateral damage to the fiber tracts connecting the cortex to subcortical forebrain structures
    3. "Stupid indifference" is now described as anosodiaphoria, or a condition in which patients with cerebral injuries are unconcerned about their neurological deficits. MRI studies show these patients to have lesions in the frontal lobes
    4. Bipolar Disorder
       - 2x as likely in MS pts

Connective Tissue Disorders Presenting With Psychiatric Symptoms

- Multiple Sclerosis
  - Cognitive Deficits[1]
    - The pattern of cognitive decline was not uniform:
      - MS patients were more frequently impaired on measures of recent memory, sustained attention, verbal fluency, conceptual reasoning, and visuospatial perception and less frequently impaired on measures of language and immediate and remote memory
    - Cognitive impairment was not significantly associated with illness duration, depression, disease course, or medication usage, but was significantly (albeit weakly) correlated with physical disability

[1]Rao 1991

Dementia-Like Syndromes

Types of Dementia

- Cortical Dementias
  - Symptoms:
    - Amnesia (difficulty forming new memory)
    - Aphasia
    - Apraxia
    - Agnosia
    - Visuospatial impairment
  - Pathology:
    - Caused by disease in temporal & parietal association areas and limbic memory circuit
  - Example: Alzheimer's disease
- Subcortical Dementias
  - Symptoms:
    - Cognitive slowing
    - Impaired memory retrieval
    - Decreased attention
    - Apathy
    - Depression & mood/ability
    - Disinhibition
    - Extrapyramidal or UMN signs
  - Pathology:
    - Usually in subcortical white matter, prefrontal cortex, basal ganglia or thalamus
  - Example: Parkinson's disease, vascular dementias, progressive supranuclear palsy

Types of Dementia

- Irreversible
  - Alzheimer disease (50%)
  - Vascular dementia (40%)
  - Parkinson disease
  - Lewy body dementia
  - Huntington disease
  - Creutzfeldt-Jakob disease
  - Pick disease (frontotemporal dementia)
- Treatable
  - TBI/Head injury
  - Infections
  - Normal pressure hydrocephalus
  - Brain tumors
  - Toxic exposure
  - Metabolic disorders (of the liver, pancreas or kidneys)
  - Hormone disorders
  - Poor oxygenation (hypoxia)
  - Drug reactions, overuse, or abuse
  - Nutritional deficiencies
  - Chronic alcoholism

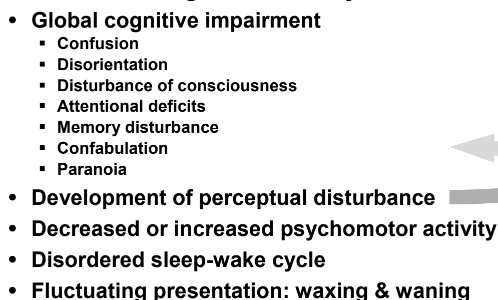
Major Classes of Disorders That can Cause Dementia

Class	Examples
Degenerative Disorders	Alzheimer's, Lewy Body disease, Pick's disease
Subcortical Disorders	Parkinson's disease, Huntington's disease, Wilson's disease
Vascular Disorders	Lacunar infarcts, large vv. Occlusion
Demyelinating Disorders	MS, metachromatic leukodystrophy
Traumatic Disorders	TBI & DAI: Posttraumatic encephalopathy, subdural hematoma
Neoplastic Disorders	Metastatic disease, meningiomas, gliomas
Hydrocephalus	Normal pressure hydrocephalus
Toxic Disorders	Occupational exposures: solvents, heavy metal.
Hypoxic Disorders	Anoxic brain injury, hypoxemia
Metabolic Disorders	CHF, encephalopathies (particularly hepatic)

Delirium in the General Hospital Definition

An sub/acute organic mental syndrome featuring:

- Global cognitive impairment
  - Confusion
  - Disorientation
  - Disturbance of consciousness
  - Attentional deficits
  - Memory disturbance
  - Confabulation
  - Paranoia



- Development of perceptual disturbance
- Decreased or increased psychomotor activity
- Disordered sleep-wake cycle
- Fluctuating presentation: waxing & waning

Delirium Pathogenesis

- From use or overdose with various medications with anticholinergic potential (tricyclics or over-the-counter drugs, or organophosphate insecticides)
- Classic symptoms include
  - "red as a beet" (flushing)
  - "dry as a bone" (lack of perspiration)
  - "blind as a bat" (mydriasis)
  - "mad as a hatter" (delirium)
  - Medication side-effect // polypharmacy
- Some of the proposed theories include:
  - Reduced/deficient cerebral metabolism (↓ EEG)
  - Deficiency/imbalance of neurotransmitters:
    - ↓ Achol synthesis & release (Central anticholinergic state: ↓Achol)
    - Enhanced central dopaminergic activity (↑ DA)
    - Increased glutamate release (↑ GLU)
    - Enhanced central noradrenergic activity (↑ NE)

Delirium: DSM-IV-TR Criteria

I. Disturbance of consciousness (i.e., reduced clarity of awareness of the environment) with reduced ability to focus, sustain or shift attention

II. Change in cognition (such as memory deficit, disorientation, language disturbance) or…

The development of a perceptual disturbance that is not better accounted for by a preexisting, established or evolving dementia

III. The disturbance develops over a short period of time (usually hours to days) and tends to fluctuate during the course of the day

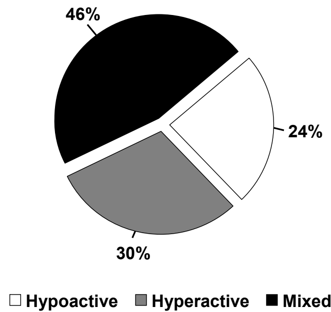
IV. There is evidence from the history, physical examination or laboratory findings that the disturbance is caused by the direct physiological consequences of a general medical condition

American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th ed. Washington, D.C.: American Psychiatric Association, 1994:129-33.

Differential Diagnosis of Delirium: Critical Items

Disorder System	Clinical Examples
Infectious	Encephalitis, meningitis, syphilis, septicemia
Withdrawal Syndromes	CNS-depressants: alcohol, barbiturates, sedative-hypnotic Rx.
Acute Metabolic	Acute Metabolic encephalopathies: acidosis/alkalosis, electrolyte disturbances, hepatic/renalfailure, hypersensitivity reactions
Trauma	Trauma: head, heat stroke, post-operative status (especially post-cardiotomy states), severe burn
CNS Pathology	Seizures, neoplasms, abscesses, hemorrhages, stroke, vasculitis, normal pressure hydrocephalus (NPH)
Hypoxia	Pulmonary/cardiac failure, hypoperfusion, anemia, hypotension, intra-operative complications, carbon monoxide poisoning
Deficiencies	Nutritional deficiencies: : B12, folate, hypovitaminosis, niacin (B3, pellagra), thiamine (B1, Beriberi and Wernicke's).
Encephalopathies	Hyper/hypo adrenalcorticism, hyper/hypo glycemia, hyper/ hypothyroidism
Acute Vascular	Hypertensive encephalopathy, shock
Toxins/Medications/ Substances	Medications (especially anticholinergic Rx), poisons, pesticides, solvents.
Heavy Metals	Lead, manganese, mercury

Delirium Subtypes



Delirium: Diagnostic Criteria (Based on Sub-Types*)

Hyperactive (3 or more)

- Hypervigilance
- Restlessness
- Fast/loud speech
- Anger/irritability
- Combativeness
- Impatience
- Uncooperative
- Laughing
- Swearing/singing
- Euphoria
- Wandering
- Easy startling
- Distractibility
- Nightmares
- Persistent thoughts

Hypoactive (4 or more)

- Unawareness
- Lethargy
- Decreased alertness
- Staring
- Sparse/slow speech
- Apathy
- Decreased motor activity

*Adapted from Liptzin and Levkoff; Br j Psych 1992

Differential Diagnosis: Hypoactive Delirium

Diagnosis	Level of Consciousness	Voluntary Movement	Speech	Eye Responses	Limb Tone	Reflexes
Akinetic mute (apathetic-midbrain)	Lethargy	Little and infrequent; but when sufficiently stimulated, can move all extremities purposefully	With stimulation, can produce normal, short phrases	Open when stimulated; usually good eye contact	Usually normal; sometimes slight increase	Can be normal; occasionally asymmetric with pathologic reflexes
Akinetic mute (coma vigil-septal)	Wakeful, with occasional outbursts; some patients somnolent	Little but purposeful; arms usually move much better than legs	Little; can occasionally produce normal phrases; also can have outbursts of unintelligible utterances	Open during much of the day in most patients; eye contact variable	Often increased in legs	Frequently have increased leg reflexes; Babinski's signs, snout, grasp often present
Apallic state (decorticate)	Awake: no meaningful interaction with environment	No or little purposeful movement; mostly reflex or mass movements	None or occasional grunting	Open, searching, but no real eye contact	Increased in all extremities; extremities often in flexion	Increase in all extremities with pathologic reflexes
Persistent vegetative state	Awake; no interaction with environment	None	None	Open, searching, but no real eye contact	Variable, usually increased; extremities often in flexion	Variable, usually increased with pathologic reflexes
Locked-in syndrome	Awake and alert; able to communicate meaningfully with examiners by eye movement	None or slight, except for eye movement	None	Open, with normal following and good eye contact; some patients have restricted lateral gaze	Increased	Increased in all extremities

Medical Causes of "Anxiety"

Medical Causes of "Anxiety"

Class	Examples
Cardiopulmonary	Arrhythmias, mitral valve prolapse, pulmonary embolism, chronic obstructive pulmonary disease, asthma, and congestive heart failure
Neurological	Seizure disorder, head injury, and vestibular disease
Metabolic and endocrine	Hyper- or hypothyroidism, hyperparathyroidism, hypoglycemia, adrenal dysfunction, pheochromocytoma, and vitamin B_{12} deficiency
Inflammatory and infectious	Systemic lupus erythematosus and HIV
Medications	Stimulant and sympathomimetic (e.g., theophylline, pseudoephedrine [Sudafed], and albuterol) antiparkinsonian cardiovascular antidepressant (especially SSRIs) anxiolytic (primarily when taken in as-needed fashion) corticosteroid insulin thyroid preparations caffeine preparations
Substance of Abuse (intoxication)	Stimulants (e.g., amphetamines, cocaine, caffeine), cannabis, PCP, inhalants, and hallucinogens
Substance of Abuse (withdrawal)	Alcohol, barbiturates, benzodiazepines, opioids, and nicotine
Toxins	Carbon monoxide, paint, and gasoline fumes

Medical Causes of "Mood Disorders"

Medical Causes of "Mood Disorders"

Neurological	Parkinson's disease, Huntington's disease, Wilson's disease, MS, cerebrovascular disease, brain tumor, traumatic brain injury, temporal lobe epilepsy and dementia
Metabolic and Endocrine	Hypo- and hyperthyroidism, hypercalcemia, hypo- and hyperadrenocorticism, hypo- and hyperparathyroidism and vitamin B_{12} deficiency
Prescribed Substances	Stimulant and sympathomimetic (e.g., methylphenidate and theophylline Corticosteroid Antiparkinsonian (e.g., L-dopa [Larodopa] and bromocriptine [Parlodel]) Antidepressant (inducing manic symptoms); immunosuppressant (e.g., cyclosporine [Neoral] and tacrolimus [Prograf]) Antihypertensive (e.g., β-blockers and methyldopa) Cancer chemotherapy (e.g., vincristine, vinblastine, interferon and procarbazine) Oral contraceptives CNS depressant (e.g., benzodiazepines and barbiturates) Heavy metals and toxins (e.g., paint and carbon monoxide)
Substances of abuse (intoxication)	Stimulants (e.g., cocaine), opioids, hallucinogens, phencyclidine (PCP) and CNS depressants (e.g., alcohol).
Substances of abuse (withdrawal)	Stimulants (e.g., cocaine) and CNS depressants (e.g., alcohol)

Medical Causes of "Mood Disorders"

Endocrine	**Hypo- and hyperthyroidism, hypercalcemia, hypo- and hyperadrenocorticism, hypo- and hyperparathyroidism, DM and vitamin B_{12} deficiency**
Metabolic	**Electrolyte disturb, renal failure, vitamin defic or excess, porphyria, Wilson's Disease, environmental toxins, heavy metals**
GI	**IBS, chronic pancreatitis, Crohn's, cirrhosis, hepatic encephalopathy**
Infectious/Inflammatory	**Systemic lupus erythematosus, neurosyphilis, and HIV**
CV	**MI, angina, CABG, cardiomyopathies**
Pulmonary	**COPD, sleep apnea, reactive airway disease**
Malignancies and Hematological	**Pancreatic carcinoma, brain tumors, paraneoplastic syndromes, anemias**
Autoimmune	**SLE, fibromyalgia, rheumatoid arthritis**

Medical Causes of "Psychosis"

Medical Causes of "Psychosis"

Class	Examples
Neurologic	Parkinson's disease, Huntington's disease, MS, visual and auditory defects, epilepsy (TLE), cerebrovascular accident and head trauma
Metabolic and endocrine	Hypo- and hyperthyroidism, hypo- and hyperadrenocorticism, hypo- and hyperglycemia, hypoxia, hypercarbia, renal failure, hepatic failure and Wilson's disease
Infectious and inflammatory	Systemic lupus erythematosus and HIV
Nutritional deficiencies	Vitamin B_{12} and thiamine
Prescribed medications	Opioid & anticholinergic (e.g., benztropine and diphenhydramine) Cardiovascular (e.g., digoxin, procainamide, methyldopa) Cancer chemotherapy (e.g., procarbazine) Corticosteroid (e.g., prednisone and dexamethasone) Immunosuppressant (e.g., cyclosporine and tacrolimus); antiparkinsonian (e.g., L-dopa and bromocriptine) Antitubercular (e.g., isoniazid, sympathomimetic (e.g., theophylline and phenylephrine) Sedative-hypnotic, Anxiolytic Disulfiram (Antabuse)
Substances of abuse (intoxication)	Stimulants (e.g., amphetamine and cocaine), hallucinogens, PCP, inhalants, cannabis, opioids and alcohol
Substances of abuse (withdrawal)	Etoh
Toxins	Heavy metals, nerve gases, organophosphate insecticides, carbon monoxide and volatile substances such as gasoline and paint

Neuropsychiatric Masquerades: Medical and Neurological Disorders That Present With Psychiatric Symptoms

José R. Maldonado, MD

1. Primary psychiatric manifestations of systemic lupus erythematosus (SLE) include:
   A. Psychosis
   B. Cognitive deficits
   C. Dementia
   D. All of the above
   E. None of the above

2. The psychiatric condition not considered a differential diagnosis for fibromyalgia is:
   A. Dysthymia
   B. Generalized anxiety disorder
   C. Schizophrenia
   D. Somatization disorder
   E. Chronic pain syndrome

3. The subgroups of brain syndromes associated with Wilson's disease include all, except:
   A. Pseudoparkinsonism associated with dilatation of the 3rd ventricle
   B. Ataxia and tremor associated with focal thalamic lesions
   C. Dyskinesia, dysarthria and personality changes associated with lesions in putamen and palladium
   D. Manic episodes associated to frontal disinhibition

4. Which would be the most appropriate psychiatric syndrome associated with neurosyphilis?
   A. Early onset OCD
   B. Panic attacks
   C. Myxedema madness
   D. Dementia

Answer:
1. D
2. C
3. D
4. A