Case Study #4: Dementia

Capt Jonathan Beatty, CPT Jennifer Fiandt, MAJ Imshin Kim,

CPT Jeffry Negard, & MAJ Audry Torres

Uniformed Services University of the Health Sciences

Case Study #4: Dementia

Dan Kale, a 57-year-old out of work steel worker, is brought in to your clinic for an evaluation. His wife made him the appointment because he has become increasingly forgetful. In fact, he missed 2 job interviews that he had set up 2 to 3 days beforehand. He is disheveled in appearance, and denies tobacco, ETOH and drugs of abuse. He is not taking any medications, does not know his family history because he was adopted and he hasn't seen a provider since he retired from the Army 10 years ago.

1. **What additional information would be helpful in evaluating Dan?**

Memory loss, and changes in mood and behavior are some signs of Alzheimer's disease ("Steps to getting a diagnosis", n.d). Because the patient is in his 50's, he can be affected by the early onset form of Alzheimer's disease which can strike a person in their 40s and 50s ("Steps to getting a diagnosis", n.d). The evaluation of a patient with suspected Alzheimer's disease should include: obtaining a detailed history, complete physical and neurological examination, and a psychiatric assessment as well as other diagnostic testing to rule out other potential causes ("Steps to getting a diagnosis", n.d).

a) **Past medical history**: ask if the patient has a history of strokes, Huntington's disease, Parkinson's disease, depression, TBI (like a head trauma from active duty). It is also important to interview family members to gather background information on the daily functioning, current mental and physical conditions, and family medical history (the patient is adopted so it will be hard to gather patient's family history), allergies, and other preventive health care routines ("Steps to getting a diagnosis", n.d).
b) **History or current use of psychoactive drugs:** such as benzodiazepines or anticholinergic drugs to rule out adverse effects of medication, and history of alcohol

abuse, nystagmus or extraocular muscle weakness in order to rule out Wernicke-Korsakoff syndrome (Simmons, Hartmann & DeJoseph, 2011).

c) **Mental Status Evaluation**: the person's orientation of time and place, and ability to remember, understand, talk and do simple calculations should be assessed ("Steps to getting a diagnosis", n.d).

d) **Physical Examination:** Evaluate the person's nutritional status and check VS, cardiac, respiratory, liver, kidney and thyroid diseases, and atherosclerosis as some of these conditions can cause symptoms ("Steps to getting a diagnosis", n.d).

e) **Neurological Exam:** Evaluate the person's nervous system for problems that may signal brain disorders other than Alzheimer's disease including: evidence of previous strokes, Parkinson's disease, hydrocephalus, a brain tumor, and other illnesses that impair memory and/or thinking, testing coordination, muscle tone and strength, eye movement, speech and sensation ("Steps to getting a diagnosis", n.d).

2. **What tools would be useful in your evaluation (e.g. PTSD screener, etc)?**

The priority of a dementia evaluation is to distinguish reversible from nonreversible causes of dementia. Mr. Kale's timeline points to a more insidious cause, but he should still be assessed right away for hypoglycemia, substance intoxication or withdrawal, or infection (Buttaro, Trybulski, Bailey, & Sandberg-Cook, 2013). Positive or suggestive findings can be followed up with diagnostic tests, and tests and imaging can also be used to look for likely causes of dementia such as cerebrovascular dementia (Buttaro et al., 2013). A thorough physical examination, including a detailed neuro exam, should be done (Cash & Glass, 2011).

There are a variety of possible causes for Mr. Kale's apparent dementia. His history may be the most helpful in helping to sort out the causes of his confusion, and his wife could help with his

history and timeline as well. Both his military experience and current occupation put him at increased risk of head injury, so he should be evaluated for traumatic brain injury (TBI). TBI frequently occurs with post-traumatic stress disorder (PTSD), so this should be screened for as well; while it may not be responsible for primary dementia, it could be contributing to depression, disassociation, and anxiety (Buttaro, Trybulski, Bailey, & Sandberg-Cook, 2013). The acronym DEMENTIA can be used to sort the most likely causes:

- D: drugs or depression
- E: emotional upset
- M: metabolic (vitamin B deficiency or hypothyroid)
- E: ear or eye impairment or sensory impairment
- N: normal pressure hydrocephalus
- T: tumors or masses
- I: infection or sepsis
- A: anemia (Cash & Glass, 2011).

A cognitive screening should be performed, and there are a variety of tools available: the Folstein Mini-Mental State Examination (MMSE), verbal fluency, Mini-Cog, and clock drawing tests are widely available, and newer tools such as the General Practitioner Assessment of Cognition are also appropriate (Feldman et al., 2008). For PTSD, there is the PTSD checklist (PCL) and Clinician Administered PTSD Scale (CAPS) (Buttaro et al., 2013). For TBI, the Acute Concussion Evaluation (ACE) or Military Acute Concussion Evaluation (MACE), and the Glasgow Coma Scale (GCS) are common tools (Buttaro et al., 2013, Defense and Veterans Brain Injury Center [DVBIC], n.d.). The Geriatric Depression Scale may be appropriate considering the patient is unemployed and older (Goolsby & Grubbs, 2011), in addition to the 7-Minute

Screen, which is used to test cognitive impairment in older adults (National Institute on Aging, 2014). Mr. Kale should also be evaluated for his ability to take care of himself safely, with a tool such as the Katz Index of Independence in Activities of Daily Living (Feldman et al., 2008).

3. **Describe the characteristics of the 2 tools you would find most helpful.**

The Verbal fluency test takes 60 seconds to administer. The patient is asked to name as many animals as they can in 60 seconds. Each unique animal named gets one point. A score of less than 15 points is suggestive of dementia. The cut-off score of 15 is 88% sensitive and 96% specific in diagnosing dementia from any cause (Simmons, Hartmann, & DeJoseph, 2011) Verbal fluency testing has the ability to identify patients with mild cognitive impairment up to five years before clinical conversion to dementia (Simmons, Hartmann, & DeJoseph, 2011) and should be included in any complete cognitive assessment. The limitations include an educational bias and inability to differentiate specific deficits.

The Mini Cognitive Assessment Instrument (Mini-Cog) takes 2-4 minutes to administer and has a high sensitivity (76%) and specificity (89%) with no educational or language bias (Simmons, Hartmann, & DeJoseph, 2011). The Mini-Cog combines a three-item recall with a clock drawing test. The patient is asked to repeat three unrelated words, perform the clock drawing test and then recall the three words. Each word on the recall is worth one point and the clock drawing test is worth 2 points, for a total of 5 points. Scores of 0-2 are suggestive of dementia where scores of 3-5 have a low likelihood of dementia (Simmons, Hartmann, & DeJoseph, 2011).

Patients who test positive on either the verbal fluency test or Mini-Cog should have follow-up cognitive testing as well as laboratory and imaging studies. I would also consider the PHQ-9 and AUDIT as these have good sensitivity and specificity for depression and alcohol

abuse, and are quick. The "world" test is another screening option. The patient is asked to spell "world" forward, then backwards, and then to list the letters in alphabetical order. The test is scored as all or none (pass/fail) and is 85% sensitive, and 88% specific (Howe, 2007).

4. **What are your top 5 differential diagnoses in order from most likely to least likely?**

   a) Dementia (Alzheimer's vs. Vascular)

   b) Depression

   c) Substance Abuse (Etoh/Illicit Drugs)

   d) CVA

   e) Brain Tumor / Space Occupying Lesion

Other potential differentials include traumatic brain injury/PTSD, medication reaction, neurosyphilis, HIV, Parkinson's disease, and psychiatric illness (Adelman & Daly, 2005). Creutzfeldt-Jakob disease is rare, but can also cause dementia; this disease can run in families. Lewy body dementia, similar to Parkinson's, can also cause dementia (Buttaro et al., 2013).

Dementia workup is often initiated due to a family member's concerns in regards to memory loss or changes in personality. At Mr. Kale's age of 57, he is young for Alzheimer's as the typical cut off age for late onset is 65, but early onset symptoms can occur as young as 30 (Mendez, 2012). Early onset Alzheimer's disease is a genetic illness and often carried in families, but we have no information about his family history. Veterans are at a higher risk of early onset Alzheimer's disease than the general population, although the reason is unknown (Mendez, 2012). Dementia is often diagnosed when a patient presents with impaired memory and one other area of cognitive impairment such as judgment, abstract thinking, performing complex tasks, or personality changes (Adelman & Daly, 2005). In order to diagnose a patient

with dementia, other treatable conditions that can mimic dementia such as depression, substance use, and CVA or brain tumor should be ruled out.

5. **What additional diagnostic tests would help confirm your diagnosis?**

Additional diagnostic tests would include: MRI (preferred) or non-contrast CT, serum levels for Vit B-12 deficiency, free T4, a TSH, an RPR (for suspicion of untreated syphilis), CBC, electrolytes, glucose, lipid profile, LFTs, toxicology screen, CSF (for proteins), a 24hr urine (for heavy metals), and ApoE genotyping (if Alzheimer's is suspected) (Aminoff & Kerchner, 2013).

PICOT Questions

Beatty: In adult patients with mild dementia, how does treatment with high dose vitamin E, compared to no treatment, affect rate of cognitive decline over a 3-year period?

Fiandt: Do veterans with traumatic brain injuries have a higher risk of early onset Alzheimer's (prior to age 65) than military veterans without TBI?

Kim: Will disease progression be slower with drug therapy compared to no drug therapy in Alzheimer's disease?

Negard: Is there a higher incidence of dementia among persons who had weekly work exposure to heavy metals for more than 1 year when compared to those persons who had no work exposure?

Torres: Does universal cognitive screening in the geriatric patient population (>65) improve short-term disease progression over one year?

References

Adelman, A.M. & Daly, M.P. (2005). Initial evaluation of the patient with suspected dementia. *American Family Physician, 71*(9), 1745-1750. Retrieved from http://www.aafp.org/afp/2005/0501/p1745.html

Aminoff, M. J. & Kerchner, G. A. (2013). Nervous system disorders: Dementia. In M. Papadakis & S. McPhee (Eds.), *Current medical diagnosis & treatment: 2013* (pp.1005-1010). New York: McGraw-Hill.

Buttaro, T. M., Trybulski, J., Bailey, P. P., & Sandberg-Cook, J. (2013). *Primary care: A collaborative practice* (4th ed.). St. Louis, Missouri: Elsevier Mosby.

Cash, J. C., & Glass, C. A. (2011). *Family practice guidelines* (2nd ed.). New York, NY: Springer Publishing Company.

Defense and Veterans Brain Injury Center. (n.d.). Military acute concussion evaluation (MACE) pocket card. Retrieved from https://dvbic.dcoe.mil/material/military-acute-concussion-evaluation-mace-pocket-cards

Feldman, H. H., Jacova, C., Robillard, A., Garcia, A., Chow, T., Borrie, M., ... Chertkow, H. (2008). Diagnosis and treatment of dementia: 2. Diagnosis. *Canadian Medical Association Journal*, *178*(7), 825-836. http://dx.doi.org/10.1503/cmaj.070798

Howe, E. (2007). Initial screening for Alzheimer's disease and minimal cognitive impairment. *Psychiatry, 4*(7), 24-27.

Mendez, M. F. (2012). Early onset Alzheimer's Disease: Nonamnestic subtypes and type 2 AD. *Archives of Medical Research*, *43*(8), 677-685. http://dx.doi.org/10.1016/j.arcmed.2012.11.009

National Institute on Aging (2014). Instruments to detect cognitive impairment in older adults: 7-minute screen. Retrieved from http://www.nia.nih.gov/research/cognitive-instrument/7-minute-screen

Pierson, C. (2011). Older patients. In M. J. Goolsby & L. Grubbs (Eds.), *Advanced assessment: Interpreting findings and formulating differential diagnoses (2nd edition)*. Philadelphia, PA: F.A. Davis Company.

Simmons, B., Hartmann, B., & DeJoseph, D. (2011). Evaluation of suspected dementia. *American Family Physician*, *84*, 895-902. Retrieved from https://www-clinicalkey-com.lrc1.usuhs.edu/#!/Content PlayerCtrl/do PlayContent/1-s2.0-S0002838X11603547

Steps to getting a diagnosis: Finding out if it's Alzheimer's disease. (n.d). Retrieved June 10, 2014 from http://www.tn.gov/comaging/documents/firststepsinfo.pdf