Topic: Mild Cognitive Impairment
Microlearning Case-based Article for
Interprofessional (IP) Age-Friendly Healthcare

Case Scenario

Edwin is a 62-year-old male with an approximate 20-year history of hypertension and 10-year history of prediabetes, presenting with concerns of memory problems over the last few months, although his spouse believes symptoms to have been occurring over the last year. He has never had any formal screening for cognitive impairment. He is concerned as his father had Alzheimer's dementia.

Learning Objectives (list only 2 as these are "microlearning" units)

- Understand presentation of mild cognitive impairment
- Apply knowledge gained to the assessment and management of minor cognitive impairment

Background

Approximately 16 million persons in the U.S. have cognitive impairment, including 12-18% of adults over the age of 60. Of those, 10-15% go on to dementia annually. For cognitive impairment related to Alzheimer's disease, about 1/3 of those with cognitive impairment progress to dementia within 5 years. Mild cognitive impairment is often thought of as normal aging, but it is a risk factor for dementia. Types of mild cognitive impairment include Amnestic MCI that primarily affects memory and non-amnestic MCI that affects thinking skills other than memory, including the ability to make sound decisions, judge the time or sequence of steps needed to complete a complex task, or visual perception.
There are multiple risk factors for mild cognitive impairment and dementia:
• Increasing age
• Having a specific form of the Apolipoprotein E gene (APOE-e4) that has been linked to Alzheimer's disease
• Some medical conditions and other factors such as:
- Diabetes
- Smoking
- High blood pressure
- High cholesterol
- Obesity
- Depression
- Sedentary lifestyle
- Infrequent participation in mentally or socially stimulating activities
(Alzheimer's Association, 2022).
Racial disparities also exist, with African Americans having higher rates of Alzheimer's disease verses non-Hispanic whites (Steenland, et al, 2015). Women are also more likely to develop Alzheimer's disease (Mielke, 2018).
Edwin is noticing minor memory lapses with difficulty recalling some conversations, difficulty concentrating, and misplacing various items around the house. He has started making notes and using reminders on his smartphone.

Edwin's current medications include lisinopril for hypertension and metformin for prediabetes. He denies any symptoms of depression, but notes anxiety over his perceived memory issues. He has risk factors for mild cognitive impairment. He describes himself as sedentary other than yard work.

Evaluation

On exam, he is alert and oriented to person, place, and time. He has no focal neurologic deficits. Other than obesity, there are no other significant physical exam findings. Mini-mental status exam shows a score of 28/30 (>25 normal). Montreal Cognitive Assessment score is 22/30 (>26 normal). PHQ-9 reveals no significant depression, but his anxiety screening with GAD-7 has a score of 7, representing mild anxiety. It's likely that Edwin has amnestic mild cognitive impairment. BMI is 34 kg/m2, blood pressure is 132/85, A1C 5.8%, and LDL cholesterol of 118. Brain MRI shows age related mild atrophy with no evidence of previous infarct. Blood chemistries, CBC, and TSH are all normal other than a fasting glucose of 116 mg/dL.

(Christa, et al, 2013, Livingston, et al, 2024)

Assessment tool	Description	Citation
Mini mental status	Cognitive Assessment	Folstein MF, Folstein SE, McHugh PR. "Mini-mental state." A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res 1975;12:189–198
Montreal Cognitive Assessment	Cognitive Assessment	Nasreddine ZS, Phillips NA, Bédirian V, et al. The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. J Am Geriatr Soc 2005;53:695–699
GAD-2 GAD-7	Anxiety screening	Sapra A, Bhandari P, Sharma S, Chanpura T, Lopp L. Using Generalized Anxiety Disorder-2 (GAD-2) and GAD-7 in a Primary Care Setting. Cureus. 2020 May 21;12(5):e8224. doi: 10.7759/cureus.8224. PMID: 32582485; PMCID: PMC7306644.
PHQ-9	Depression Screening	American Psychological Association.https://www.apa.org/depression-guideline/patient-health-questionnaire.pdf (accessed 8/13/24)

Intervention/Treatment

Interventions for Edwin included lifestyle modification with a referral to a dietitian for weight management with consideration of future use of medications for weight loss. He also has some interest in joining a fitness center and working with a personal trainer to increase his overall activity, assist in weight loss, and offer some socializing, which he feels he has lost in recent months. Lifestyle modification may offer benefits in mild cognitive impairment and dementia. Although not FDA-indicated, in addition, metformin may slow cognitive decline (Kuate, et al 2024), and Edwin is already using this for diabetes prevention. For his anxiety, it is recommended that he consider seeing a mental health professional. A pharmacy review reveals no concerns about polypharmacy. Socializing and reading are among recommendations that could be made for more mentally stimulating activities. His current habit of notes and alarms remains a reasonable compensatory action.

(Alzheimer's Association, 2022, Livingston et all, 2024)

Case Scenario Resolution

Edwin had a typical presentation of mild cognitive impairment with risk factors for dementia. In addition, he has anxiety related to his memory difficulties. At present, lifestyle and compensatory mechanisms, along with more mentally stimulating activities are recommended with control of other risk factors such as blood pressure to a target of <130/<80 if it can be done reasonably, dyslipidemia, and avoiding conversion from prediabetes to type 2 diabetes.

An interprofessional team approach is warranted, and for the future other team members may be consulted, including formal testing by a neuropsychologist as well as referral to a neurologist and/or a geriatrician. Medication could also be considered, such as a cholinesterase inhibitor. He will see his primary care provider every 6 months for review and further evaluation and/or treatment.

Summary

Mild cognitive impairment is common, and a risk factor for future dementia. Edwin is likely early in the course of his mild cognitive impairment with support from his spouse and a willingness to improve lifestyle factors and control his modifiable risk factors. A guideline-based plan is in place for follow-up and treatment involving an interprofessional team to slow his mild cognitive impairment progression, keep him safe, and improve his quality of life.

References

1. Alzheimer's Association. Special Report: More Than Normal Aging: Understanding Mild Cognitive Impairment (2022, https://www.alz.org/media/Documents/alzheimers-facts-and-figures-special-report-2022.pdf accessed August 15, 2024)
2. Christa Maree Stephan B, Minett T, Pagett E, et alDiagnosing Mild Cognitive Impairment (MCI) in clinical trials: a systematic review. BMJ Open 2013;3:e001909. doi: 10.1136/bmjopen-2012-001909
3. Steenland, Kyle et al. 'A Meta-Analysis of Alzheimer's Disease Incidence and Prevalence Comparing African-Americans and Caucasians.' 1 Jan. 2016 : 71 – 76.
4. Mielke MM. Sex and Gender Differences in Alzheimer's Disease Dementia. Psychiatr Times. 2018 Nov;35(11):14-17. Epub 2018 Dec 30. PMID: 30820070; PMCID: PMC6390276.

5. Kuate Defo A, Bakula V, Pisaturo A, Labos C, Wing SS, Daskalopoulou SS. Diabetes, antidiabetic medications and risk of dementia: A systematic umbrella review and meta-analysis. Diabetes Obes Metab. 2024 Feb;26(2):441-462. doi: 10.1111/dom.15331. Epub 2023 Oct 23. PMID: 37869901.

Microlearning Article Reference

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