Cochrane Corner

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How good is the diagnostic test accuracy of telehealth assessment for dementia and mild cognitive impairment? A Cochrane Review summary with commentary

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Abstract.

BACKGROUND: It is estimated that 50% to 80% of people living with dementia worldwide remain undiagnosed and undocumented and have no access to care and treatment. Telehealth services can be utilized as one of the options to improve access to a diagnosis, especially for people living in rural areas or affected by COVID-19 containment measures.

OBJECTIVE: To assess the diagnostic accuracy of telehealth assessment for dementia and mild cognitive impairment (MCI).

METHODS: A summary of the Cochrane Review by McCleery et al. 2021, with comments from a rehabilitation perspective.

RESULTS: Three cross-sectional diagnostic test accuracy studies (N = 136) were included. Participants were referred from primary care when presenting with cognitive symptoms or were identified as being at high risk of having dementia on a screening test in the care homes. The studies found that telehealth assessment correctly identified 80% to 100% of the people who were diagnosed with dementia during face-to-face assessment and also correctly identified 80% to 100% of people who did not have dementia. Only one study (N = 100) focused on MCI; 71% of participants who had MCI and 73% of participants who did not have MCI were correctly identified via telehealth assessment. Telehealth assessment in this study correctly identified 97% of the participants who had either MCI or dementia, but correctly identified only 22% of those who did not have either.

CONCLUSION: Telehealth assessment for diagnosing dementia seems to have a good level of accuracy when compared to face-to-face assessment, although the small number of studies and small sample sizes and differences between the included studies indicate that the results are uncertain.

Keywords: Dementia, mild cognitive impairment, telehealth, systematic review

The aim of this commentary is to discuss from a rehabilitation perspective the Cochrane Review "Diagnostic test accuracy of telehealth assessment for dementia and mild cognitive impairment" (McCleery et al., 2021) by McCleery, Laverty, Terry J Quinn[a], published by Cochrane Dementia and Cognitive Improvement Group. This Cochrane Corner is produced in agreement with NeuroRehabilitation by Cochrane Rehabilitation with views* of the review

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summary author in the "implications for practice" section.[a]

1. Background

Dementia is a syndrome of progressive nature that affects patients' cognitive functioning and the ability to manage daily tasks independently beyond what is expected as a consequence of physiological ageing (Flier & Scheltens, 2005). Mild Cognitive Impairment (MCI) refers to a condition where the autonomy in daily life activities is maintained despite the presence of cognitive deficits; MCI could constitute a prodromic phase of dementia, but it doesn't necessarily lead to a dementia diagnosis. A timely diagnosis of dementia or MCI is essential for patients and caregivers to access information, support, and treatment. Unfortunately, most people showing cognitive impairment do not get a diagnosis. According to a 2011 estimate, 50% to 80% of cases worldwide were undiagnosed and undocumented (Prince et al., 2011). COVID-19 pandemic has exacerbated the situation by disrupting access to health services for older people. Telehealth assessments allow high-quality diagnosis without face-to-face interaction thus improving access to specialist services for dementia in a COVID-19 safe context.

Diagnostic test accuracy of telehealth assessment for dementia and mild cognitive impairment (McCleery, Laverty, Quinn, 2021)

2. Objective

The aim of this Cochrane Review was to assess the diagnostic accuracy of telehealth assessment for dementia and mild cognitive impairment.

3. What was studied and methods

The population addressed in this review was elderly (mean ages ranged from 75 to 79 years) with a suspected cognitive impairment who presented to a specialist service for assessment for all-cause dementia or MCI. The index test assessed was a diagnostic assessment conducted via videoconference system of dementia or MCI compared to standard face-to-face dementia assessments. Some of the data in the telehealth assessment were collected face-to-face (e.g., by nurses), but all contact between patients and the specialist clinician responsible for the diagnosis took place remotely.

4. Results

The review included three cross-sectional diagnostic test accuracy studies with short intervals between the two assessments (<1 day to mean 8.2 (SD 2.3) days) (N = 136). No summary estimates of sensitivity and specificity were calculated because of the small number of studies and the differences between them.

The results for the diagnosis of dementia (3 studies, N = 136) with a pre-test probability of 50% are:

- True positives (patients correctly classified as having dementia): 40 to 50%. Very low certainty of evidence.
- False negatives (patients incorrectly classified as not having dementia): 0 to 10%. Very low certainty of evidence.
- True negatives (patients correctly classified as not having dementia): 40 to 50%. Very low certainty of evidence.
- False positives (patients incorrectly classified as having dementia): 0 to 10%. Very low certainty of evidence.

The results for the diagnosis of MCI (1 study, N = 100) with a pre-test probability of 40% are:

- True positives (patients correctly classified as having MCI): 28% (95% CI 22 to 34) (sensitivity 0.71, 95% CI 0.54 to 0.84). Low certainty of evidence.
- False negatives (patients incorrectly classified as not having MCI): 12% (95% CI 6 to 18). Low certainty of evidence.
- True negatives (patients correctly classified as not having MCI): 44% (95% CI 36 to 50) (speci-

ficity 0.73, 95% CI 0.60 to 0.84). Low certainty of evidence.

- False positives (patients incorrectly classified as having MCI): 16% (95% CI 10 to 24). Low certainty of evidence.

5. Conclusions

The authors concluded that telehealth assessment for diagnosing all-cause dementia seems to have a good level of accuracy when compared to a face-to-face assessment. The evidence, though, is uncertain due to the small number of studies and sample sizes, and between-study heterogeneity. Furthermore, it is important to note that these estimates may mainly apply to telehealth models incorporating a considerable amount of face-to-face contact with healthcare professionals other than the specialist responsible for making the diagnosis. Telehealth appeared to be a little more accurate for diagnosing dementia than for diagnosing MCI.

6. Implications for practice in neurorehabilitation

In some settings, telehealth may be the only option for patients to access health services due to COVID-19 containment measures or lack of doctors or other healthcare professionals with specialist training in their area. The available studies suggest that telehealth assessment may be highly sensitive and specific for the diagnosis of dementia when compared to a reference standard of conventional face-to-face assessment, but the estimates are very imprecise. Furthermore, it is not possible to conclude about the accuracy of the diagnosis of dementia subtypes (e.g, vascular dementia, frontotemporal dementia, Alzheimer's disease) which require different rehabilitation treatments. Only one study focused on the telehealth assessment of MCI and the best estimates of both sensitivity and specificity were lower.

Further research into the accuracy of a range of telehealth models and into how to improve telehealth assessment is needed to reduce uncertainty about diagnostic accuracy. Telehealth services could be the mean of allowing all patients and caregivers to access specialized treatment and not only a diagnosis. In fact, it is crucial for them to follow rehabilitation protocols tailored to their specific type of dementia, and also receive education about progressive cognitive impairment and psychological support.

Conflict of interest

The author declares no conflicts of interest.

Acknowledgments

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