

Best Evidence Summaries of Topics in Mental Healthcare

BEST in MH *clinical question-answering service*

Question

“How effective is The Allen Cognitive Level Screen or Large Allen Cognitive Level Screen, compared to other tools, for assessing functional cognition in people with dementia?”

Clarification of question using *PICTRO* structure

<i>Patients:</i>	Adults with dementia
<i>Index Test:</i>	Allen Cognitive Level Screen or Large Allen Cognitive Level Screen
<i>Comparator Test:</i>	Any other tools
<i>Target condition:</i>	Dementia (the test assesses cognitive functioning)
<i>Reference Standard:</i>	Any reported reference standard
<i>Outcome:</i>	Sensitivity & specificity for assessing functional cognition

Clinical and research implications

One, poorly reported study provided early stage results indicating that the Allen Cognitive Level Screen (ACL) or Large Allen Cognitive Level Screen (LACL) may have the potential to discriminate between people with dementia and healthy elderly people; ACL and LACL score were significantly different between the two groups. However, this study does not provide any information on the effectiveness of either the ACL or the LACL as a screening tool for dementia. Similarly, it does not provide any information on the utility of the LACL in people who are unable to see or manipulate the original ACL; persons with poorer vision were explicitly excluded from the study.

Further research is needed to determine the optimal ACL/LACL diagnostic threshold(s) for the target condition(s). The test(s) would then need to be validated, against an appropriate reference standard(s), in a sample clinical population with unknown diagnosis.

What does the evidence say?

Number of included studies/reviews (number of participants)

We were unable to identify any studies that assessed the diagnostic performance (sensitivity and specificity) of Allen Cognitive Level Screen (ACL) or Large Allen Cognitive Level Screen (LACL) for the diagnosis of dementia. This evidence summary includes one study that examined the correlation between ACL and LACL scores, and between each version of the tool and other measures of cognitive function (the Mini Mental State Examination (MMSE) and the Routine Task Inventory (RTI)), in healthy elderly people and people with a diagnosis of probable Alzheimer's disease (AD). It does not provide information on the ability of either the ACL or the LACL to diagnose dementia or to determine a specified level of cognitive function.

Main Findings

The study reports no statistically significant difference between scores on the ACL and LACL in either the AD group or the healthy elderly group. These data indicate that the two versions of the tool are likely to have similar operational performance, however, they do not provide any indication of whether or not the LACL could be effectively used to obtain a score in people who are unable to use the ACL. The article also states that the results of multivariate analysis indicated that AD participants were significantly impaired compared to healthy participants, on both the ACL and LACL, after controlling for age (<75 years vs. ≥75 years), sex and test order. This analysis was not fully reported and it is therefore not possible to assess its reliability, however, the reported results indicate that both the ACL and LACL may have potential utility as a screening test for dementia (based on the observed difference in scores between healthy people and people with probable AD). In order to validate the test(s), receiver operating characteristic (ROC) analysis would be required to determine the optimal diagnostic threshold(s) for the target condition(s). The clinical performance of the tests would then need to be assessed, against the appropriate reference standard, in a population with unknown diagnosis. It should also be noted that the apparent difference in ACL and LACL scores between age groups, in the healthy elderly population, indicates that age-specific diagnostic thresholds may need to be considered.

Authors Conclusions

The authors stated that their study demonstrates that an enlarged ACL (the LACL) can be effectively used as a screening tool for cognitive dysfunction in elderly persons who may not be able to see or manipulate the original version.

Reliability of conclusions/Strength of evidence

This study cannot be assessed using the QUADAS-2 tool, as it is not a test accuracy study. The study was a poorly reported, early stage exploration of the potential of the ACL and LACL to discriminate between people with dementia and healthy elderly people, and the relationship between ACL and LACL scores and other measures of cognitive function. The study does not, as suggested by the authors, demonstrate the effectiveness of either the ACL or the LACL as a screening tool for dementia. Similarly, it does not provide any information on the utility of the LACL in people who are unable to see or manipulate the original ACL; persons with poorer vision were explicitly excluded from the study.

What do guidelines say?

Neither NICE nor SIGN guidelines discuss the use of the Allen Cognitive Level Screen for assessing cognitive function in dementia.

Date question received: 19/08/2014

Date searches conducted: 29/08/2014

Date answer completed: 15/09/2014

References

Kehrberg, K. L., Kuskowski, M. A., Mortimer, J., & Shoberg, T. D. (1993). Validating the use of an enlarged, easier-to-see Allen Cognitive Level Test in geriatrics. *Physical & Occupational Therapy in Geriatrics*, 10(3), 1-14.

Results

Primary Studies

Author (year)	Inclusion criteria	Number of participants	Summary of results	Risk of bias
Kehrberg et al. (1992)	<p><i>Participants:</i> Two groups were included: (1) Healthy individuals of retirement age (2) Individuals with a diagnosis of probable Alzheimer's disease (for at least 3 years), based upon NINCDS-ADRDA criteria. Exclusion criteria for both groups: history of severe head trauma or cerebrovascular accident.</p> <p><i>Index test 1:</i> Large Allen Cognitive Level Screen (LACL) – an enlarged version of the Allen Cognitive Level (ACL) Screen, a brief screening tool used to determine levels of cognitive functioning, relevant to activities of daily living.</p> <p><i>Comparator test 1:</i> Allen Cognitive Level (ACL) Screen.</p> <p><i>Comparator test 2:</i> Mini Mental State Examination (MMSE).</p> <p><i>Comparator test 3:</i> Routine Task Inventory (RTI).</p> <p><i>Reference standard:</i> None</p> <p><i>Target condition:</i> Cognitive functioning in</p>	<p>Healthy elderly, n = 34; Alzheimer's disease n = 49</p>	<p>This study aimed to compare the ACL to the modified LACL, in terms of scores achieved by older people without visual motor impairment.</p> <p>The study provides information on the correlation between the ACL and the LACL in two groups of participants (healthy adults and people with probable Alzheimer's disease (AD)) and on the correlation between each of the two versions of the test and other measures of cognitive function (MMSE and RTI). It does not provide information on the ability of either the ACL or the LACL to diagnose dementia or to determine a specified level of cognitive function.</p> <p>The mean age of study participants was approximately 75 years and approximately 52% were female. The mean MMSE score in the healthy group was 28.6 (range 25-30) and the mean MMSE score in the probable AD group was 7.6 (range 0-24). With the exception of 15 participants in the Alzheimer's disease group, in whom it was not possible to assess visual ability due to aphasia, all participants could distinguish the right side from the wrong side of the ACL. People with poorer vision (threshold not specified) on a standard visual acuity test were unable to distinguish the</p>	<p>This study cannot be assessed using the QUADAS-2 tool, as it is not a test accuracy study.</p>


	<p>older adults. <i>Outcome:</i> Correlation between test scores.</p>		<p>different sides of the ACL and were excluded from the study (number excluded not specified).</p> <p>There was no statistically significant difference between scores on the ACL and LACL in either the AD group (15.1±11.8 and 15.8±11.8, respectively) or the healthy elderly group (36.0±5.2 and 36.6±5.0, respectively).</p> <p>The results of multivariate analysis (not fully reported in the article) indicated that AD participants were significantly impaired compared to healthy participants, on both the ACL and LACL, after controlling for age (<75 years vs. ≥75 years), sex and test order.</p> <p>Both ACL and LACL scores were strongly correlated (Pearson correlation coefficients 0.79 or higher) with MMSE and RTI scores. However, it was not clear whether these data were derived from the whole study population or the AD population alone.</p> <p>For the normal elderly population, there was a statistically significant difference in mean ACL score between the 60-75 years age group (37.45±5.2) and the 76-91 years age group (33.93±4.5); a similar difference was also observed for the LACL.</p>	
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Risk of Bias

Primary studies

Study	RISK OF BIAS			
	PATIENT SELECTION	INDEX TEST	REFERENCE STANDARD	FLOW AND TIMING
Kehrberg et al. (1992)	This study cannot be assessed using the QUADAS-2 tool, as it is not a test accuracy study.			

 Low Risk

 High Risk

 Unclear Risk

Search Details

Source	Search Strategy	Number of hits	Relevant evidence identified
<i>SRs and Guidelines</i>			
NICE	Allen Cognitive impairment Dementia	249	0
DARE	(sensitivity OR specificity) IN DARE 5409 Delete 2 ((pre-test OR pretest OR posttest OR post-test) adj3 probability) IN DARE 106 Delete 3 (predictive adj2 value) IN DARE 741 Delete 4 (likelihood adj2 ratio) IN DARE 216 Delete 5 (diagnos* adj3 accurac*) IN DARE 1102 Delete 6 (diagnos* adj3 test) IN DARE 289 Delete 7 MeSH DESCRIPTOR Sensitivity and Specificity EXPLODE ALL TREES 3658 Delete 8 MeSH DESCRIPTOR Predictive Value of Tests EXPLODE ALL TREES 998 Delete 9 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 7866 Delete 10 (dement* OR alzheimer*) IN DARE 688 Delete 11 MeSH DESCRIPTOR Alzheimer Disease EXPLODE ALL TREES 294 Delete 12 MeSH DESCRIPTOR Dementia EXPLODE ALL TREES 587 Delete 13 MeSH DESCRIPTOR Dementia, Vascular EXPLODE ALL TREES 21 Delete 14 MeSH DESCRIPTOR Frontotemporal Dementia EXPLODE ALL TREES 3 Delete 15 MeSH DESCRIPTOR Lewy Body Disease EXPLODE ALL TREES 5 Delete 16 #10 OR #11 OR #12 OR #13 OR #14 OR #15 922 Delete 17 #9 AND #16	137	0
<i>Primary studies</i>			
CENTRAL	Allen Cognitive Level: 0 Results	0	0

PsycINFO	<p>1. PsycINFO; (dementia OR alzheimer*).ti,ab; 66461 results.</p> <p>2. PsycINFO; ALZHEIMER'S DISEASE/; 32021 results.</p> <p>3. PsycINFO; exp DEMENTIA/; 53005 results.</p> <p>4. PsycINFO; 1 OR 2 OR 3; 68776 results.</p> <p>5. PsycINFO; (sensitivity OR specificity).ti,ab; 80492 results.</p> <p>6. PsycINFO; (pretest ADJ probability).ti,ab; 29 results.</p> <p>7. PsycINFO; (pre-test ADJ probability).ti,ab; 16 results.</p> <p>8. PsycINFO; (post-test ADJ probability).ti,ab; 23 results.</p> <p>9. PsycINFO; "predictive value*".ti,ab; 5825 results.</p> <p>10. PsycINFO; "likelihood ratio*".ti,ab; 1308 results.</p> <p>11. PsycINFO; 5 OR 6 OR 7 OR 8 OR 9 OR 10; 85685 results.</p> <p>12. PsycINFO; (allen* AND cognitive AND level AND screen*).ti,ab; 14 results.</p> <p>39. PsycINFO; 4 AND 11 AND 12; 0 results.</p> <p>31. PsycINFO; 4 AND 12; 1 results.</p>	14	1
Embase	<p>41. EMBASE; (allen* AND cognitive AND level AND screen*).ti,ab; 16 results.</p> <p>42. EMBASE; (dementia OR alzheimer*).ti,ab; 172856 results.</p> <p>43. EMBASE; ALZHEIMER'S DISEASE/; 105650 results.</p> <p>44. EMBASE; exp DEMENTIA/; 227488 results.</p> <p>45. EMBASE; 42 OR 43 OR 44; 253621 results.</p> <p>46. EMBASE; 41 AND 45; 2 results.</p> <p>47. EMBASE; (sensitivity OR specificity).ti,ab; 826653 results.</p> <p>48. EMBASE; (pretest ADJ probability).ti,ab; 1282 results.</p> <p>49. EMBASE; (pre-test ADJ probability).ti,ab; 793 results.</p> <p>50. EMBASE; (post-test ADJ probability).ti,ab; 484 results.</p> <p>51. EMBASE; "predictive value*".ti,ab; 92350 results.</p> <p>52. EMBASE; "likelihood ratio*".ti,ab; 11343 results.</p> <p>53. EMBASE; SENSITIVITY AND SPECIFICITY/; 203872 results.</p> <p>54. EMBASE; DIAGNOSTIC ACCURACY/; 183443 results.</p> <p>55. EMBASE; 47 OR 48 OR 49 OR 50 OR 51 OR 52 OR 53 OR 54; 1079552 results.</p>	16	0

	56. EMBASE; 46 AND 55; 1 results.		
Cinahl	58. CINAHL; (allen* AND cognitive AND level AND screen).ti,ab; 12 results. 59. CINAHL; (dementia OR alzheimer*).ti,ab; 27989 results. 60. CINAHL; ALZHEIMER'S DISEASE/; 14728 results. 61. CINAHL; exp DEMENTIA/; 34691 results. 62. CINAHL; 59 OR 60 OR 61; 38867 results. 63. CINAHL; 58 AND 62; 1 results.	12	0
Summary	NA	NA	

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