Cognitive Declines Year by Year in Non-Demented Elderly Aged 70 to 90 Years

Keith Wesnes\textsuperscript{1,2}; Brian Saxby\textsuperscript{2}; Gary Ford\textsuperscript{2}

\textsuperscript{1}Bracket, Goring on Thames, United Kingdom
\textsuperscript{2}Centre for Human Psychopharmacology, Swinburne University, Melbourne, Australia
Cognitive declines year by year in non-demented elderly aged 70 to 90 years

Keith Wesnes1,2; Brian Saxby3; Gary Ford3
1Bracket, Goring on Thames, UK and 2Centre for Human Psychopharmacology, Swinburne University, Melbourne, Australia
keith.wesnes@bracketglobal.com

BACKGROUND

FROM AAMI TO PRECLINICAL AD - 25 YEARS OF PROGRESS?

NEUROPSYCHOLOGICAL TESTS

COGNITIVE FUNCTION USING STANDARD LONG-TERM EVALUATION OF TRAINING / PRACTICE EFFECTS

The CDR System shows clear patterns of cross-sectional declines to cognitive function with ageing, which are particularly evident after 60 years of age. The present study sought to determine whether declines in these domains could be identified in elderly individuals when tested repeatedly over a 5 year period.

The crucial thing is repetition over time. The effect sizes of these impairments were of clinical relevance, for Power of Attention an Effect Size impairment of 1 was seen after 3 years, which doubled in size after 5 years. The Effect Sizes of the other three measures were in the region of 0.5 over the 5 year period, medium sized impairments again of clinical relevance.

Age related cognitive decline should be a treatable condition. Almost all neuropsychological tests are excellent for cross-sectional work. The data below are plotted as mean decline per year with 95% confidence intervals. Thus if the confidence interval does not cross the zero line, the decline is statistically significant.

Clear declines in major aspects of cognitive function with normal ageing seen in Cross-Sectional Studies. Neuropsychological tests show training effects, if such training can be overcome.

The effect sizes of these impairments were of clinical relevance, for Power of Attention an Effect Size impairment of 1 was seen after 3 years, which doubled in size after 5 years. Test-retest reliability may be necessary but it is not sufficient for test utility.

The crucial thing is repetition over time. The effect sizes of these impairments were of clinical relevance, for Power of Attention an Effect Size impairment of 1 was seen after 3 years, which doubled in size after 5 years. Test-retest reliability may be necessary but it is not sufficient for test utility.

CDR tests have low coefficients of variation which may help explain their sensitivity in this study.

While we do not need more tests, we do need a uniform set of criteria to assess their worth. No test should be considered ‘ready’ unless it has proven sensitivity to treatment effects in an appropriate population.

Neuropsychological tests with notable training effects such as those used by Wilson et al (2002) do not appear fit for purpose for clinical trials unless such training can be overcome.

Preclinical AD trials will require the detection of greater than expected rates of decline in certain individuals in later middle age.

Using tests subject to practice effects will not be useful in such research.

The characteristics of the tests presented in this study are those required for tests to be used in long term studies of cognitive ageing.

CONCLUSIONS

The CDR System shows clear patterns of cross-sectional declines to cognitive function with ageing, which are particularly evident after 60 years of age. The present study sought to determine whether declines in these domains could be identified in elderly individuals when tested repeatedly over a 5 year period.

Clear declines in major aspects of cognitive function with normal ageing seen in Cross-Sectional Studies. Neuropsychological tests show training effects, if such training can be overcome.

The effect sizes of these impairments were of clinical relevance, for Power of Attention an Effect Size impairment of 1 was seen after 3 years, which doubled in size after 5 years. Test-retest reliability may be necessary but it is not sufficient for test utility.

CDR tests have low coefficients of variation which may help explain their sensitivity in this study.

While we do not need more tests, we do need a uniform set of criteria to assess their worth. No test should be considered ‘ready’ unless it has proven sensitivity to treatment effects in an appropriate population.

Neuropsychological tests with notable training effects such as those used by Wilson et al (2002) do not appear fit for purpose for clinical trials unless such training can be overcome.

Preclinical AD trials will require the detection of greater than expected rates of decline in certain individuals in later middle age.

Using tests subject to practice effects will not be useful in such research.

The characteristics of the tests presented in this study are those required for tests to be used in long term studies of cognitive ageing.

RESEARCH QUESTION

Age-Associated Memory Impairment (AAMI)/Age Related Cognitive Decline (ARCD) - Illustrated by cross-sectional declines with normal ageing on CDR System domains (horizontal bars are standard deviations of decline from 18-25)

Effect Sizes of the other three measures were in the region of 0.5 over the 5 year period, medium sized impairments again of clinical relevance.

Age related cognitive decline should be a treatable condition. Almost all neuropsychological tests are excellent for cross-sectional work. The data below are plotted as mean decline per year with 95% confidence intervals. Thus if the confidence interval does not cross the zero line, the decline is statistically significant.

Clear declines in major aspects of cognitive function with normal ageing seen in Cross-Sectional Studies. Neuropsychological tests show training effects, if such training can be overcome.

The effect sizes of these impairments were of clinical relevance, for Power of Attention an Effect Size impairment of 1 was seen after 3 years, which doubled in size after 5 years. Test-retest reliability may be necessary but it is not sufficient for test utility.

CDR tests have low coefficients of variation which may help explain their sensitivity in this study.

While we do not need more tests, we do need a uniform set of criteria to assess their worth. No test should be considered ‘ready’ unless it has proven sensitivity to treatment effects in an appropriate population.

Neuropsychological tests with notable training effects such as those used by Wilson et al (2002) do not appear fit for purpose for clinical trials unless such training can be overcome.

Preclinical AD trials will require the detection of greater than expected rates of decline in certain individuals in later middle age.

Using tests subject to practice effects will not be useful in such research.

The characteristics of the tests presented in this study are those required for tests to be used in long term studies of cognitive ageing.

CONCLUSIONS

The CDR System shows clear patterns of cross-sectional declines to cognitive function with ageing, which are particularly evident after 60 years of age. The present study sought to determine whether declines in these domains could be identified in elderly individuals when tested repeatedly over a 5 year period.

Clear declines in major aspects of cognitive function with normal ageing seen in Cross-Sectional Studies. Neuropsychological tests show training effects, if such training can be overcome.

The effect sizes of these impairments were of clinical relevance, for Power of Attention an Effect Size impairment of 1 was seen after 3 years, which doubled in size after 5 years. Test-retest reliability may be necessary but it is not sufficient for test utility.

CDR tests have low coefficients of variation which may help explain their sensitivity in this study.

While we do not need more tests, we do need a uniform set of criteria to assess their worth. No test should be considered ‘ready’ unless it has proven sensitivity to treatment effects in an appropriate population.

Neuropsychological tests with notable training effects such as those used by Wilson et al (2002) do not appear fit for purpose for clinical trials unless such training can be overcome.

Preclinical AD trials will require the detection of greater than expected rates of decline in certain individuals in later middle age.

Using tests subject to practice effects will not be useful in such research.

The characteristics of the tests presented in this study are those required for tests to be used in long term studies of cognitive ageing.