

Final report summary:

Can a screening tool effectively diagnose anxiety in older stroke survivors?

Validity and Reliability of the Geriatric Anxiety Inventory in screening for post-stroke anxiety in older people

PROJECT CODE: TSA 2010-07

PRINCIPAL INVESTIGATOR: DR HELENA HARDER

INSTITUTION: UNIVERSITY OF SUSSEX

Why did we fund this research?

Anxiety affects between 18% to 25% of stroke survivors at any stage after their stroke^{1,2,3}. Predictors of anxiety after a stroke include having depression before the stroke and the severity of the stroke itself, especially the severity of memory and thinking problems after stroke known as cognitive impairment⁴.

Anxiety after stroke is associated with poorer outcomes for the stroke survivor, which include a reduced quality of life (QoL), and a reduction in the ability to perform activities of daily living such as bathing, dressing, shopping and housework.⁵⁻⁸

Accurate screening for anxiety symptoms is the crucial first step in identifying stroke patients in need of further testing and treatment, and has been recommended in clinical guidance.⁹ However, research suggests that the vast majority of screening tools have been developed in and for populations of young or middle aged adults and are poor in detecting anxiety in older people (aged 65 and above) or are not suitable for use in patients with mild cognitive impairment. This makes them inappropriate to use in older patients with stroke.¹⁰⁻¹²

The Geriatric Anxiety Inventory (GAI) is a screening tool specifically designed to measure symptoms of anxiety in older adults¹³. The inventory contains 20 statements and has an "agree / disagree" response format to each statement. This makes it quick and easy to administer. It can also be self-rated by patients or administered to them by a health professional.

This study examined whether the GAI was a valid and reliable screening tool for use in older stroke patients.¹³ It also compared the GAI to the Hospital Anxiety and Depression Scale (HADS) which is a self-reported measure for anxiety and depression commonly used after stroke.¹⁴

If the GAI was found to be valid, reliable, and perform better than the HADS, it could become routinely used within stroke units to better detect anxiety in older stroke patients. With better detection, anxious, older stroke patients may then be referred for appropriate treatment, like drug or psychological therapies, to improve their stroke rehabilitation outcomes and quality of life.

What did the researchers do?

Eighty one stroke patients (inpatients at hospital) were recruited to participate in the study between March 2013 and February 2015. The average age of participants was 79 years old, and participation in the study occurred at a median of 43 days after stroke.

The study had three phases. In phase one, participants were administered the GAI and the Hospital Anxiety and Depression Scale (HADS) screening tools. After administration of both screening tools, participants were asked which they preferred completing. Phase one took up to 30 minutes for each participant to complete.



Phase two of the study involved a semi-structured interview and took place between one and seven days after phase one. The semi-structured interview was the research version of an internationally recognised structured clinical interview for mental disorders (SCID-I)¹⁵ and was used to examine whether the participant was clinically anxious. The semi-structured interview was used as the benchmark or 'gold standard' against which to compare the scores of the GAI and HADS screening tools. It was administered independently of the screening tools to avoid the interviewers being influenced by their findings. Phase two of the study took approximately 45 minutes for each participant to complete.

What did the research find?

Phase three took place seven to 10 days after phase one and took 15 minutes for each participant to complete. It repeated the GAI in order to examine whether the scores obtained were consistent across repeated testing (known as the 'test-retest reliability'). A screening tool is considered consistent if a person's score is the same when administered on two separate occasions.

The time between phase one and phase two of the study was a median of three days, and the time between phase two and phase three was a median of three days.

The data from all phases of the study were analysed using statistics. The proportion of study participants with anxiety was assessed by calculating the percentage of participants diagnosed as anxious by the semi-structured interview. A 'test-retest reliability' statistic was used to assess how consistent phase one GAI scores were compared to phase three GAI scores.

A type of graph known as a ROC (receiver operator characteristic) curve was used to compare GAI and HADS scores to the result of the semi-structured interview, to determine how effective they were. ROC curves of GAI and HADS showed how sensitive each was to detecting anxiety, and how specific each was in terms of being able to detect anxiety rather than to mis-diagnose depression as anxiety. Having a high sensitivity and specificity for the detection of anxiety are desired qualities from a screening tool. The area under the ROC curve is an overall measure of how well these outcomes are achieved¹⁶.

Participants' screening tool preference was assessed by calculating the percentage of participants who preferred the GAI, the HADS, and those who had no preference between the GAI and HADS.

Out of 81 participants, 69 completed phase two of the study (85%) and 53 (65%) phase three. All loss to follow-up was due to patients being discharged from hospital.

In phase two, the semi-structured interview diagnosed anxiety in patients at a rate of almost 12%. This is lower than other estimates from prevalence studies (18%) which calculate the proportion of patients with anxiety in a population of stroke survivors. This result may be due to anxious patients avoiding taking part in a study focused solely on these symptoms; avoidance being a hallmark of anxiety.

Thirty-nine (48%) of participants preferred to complete the GAI, 26 (32%) preferred the HADS and 16 (20%) expressed no preference.

The GAI was found to be an acceptable and reliable screening tool to administer in the older people with stroke who took part in this study. The ability for the GAI to discriminate anxiety from depression in these patients was found to be of an acceptable level. The GAI performed better than the HADS in its overall effectiveness, which was shown by the area under the ROC curve for the GAI being significantly larger than for the HADS.

The participants in this study were all in-patients and relatively recently diagnosed with a stroke. The results of this investigation may therefore not apply to those in the community after stroke.

A systematic review of predictors of anxiety after stroke was published as part of this study in the *Journal of Stroke and Cerebrovascular Diseases* in 2015⁴.

The main findings from this study were published in the journal *Clinical Rehabilitation* in 2015¹⁷.

What does this mean for stroke survivors?

Anxiety impacts the outcomes of stroke. Few screening tools are currently validated to screen for anxiety after stroke, with none specifically for use with older stroke survivors. This study suggests that the Geriatric Anxiety Inventory (GAI) appears to be a valid and reliable screening tool for anxiety in older hospital in-patients with stroke.

References

1. Lincoln N, Kneebone I, Macniven J, Morris R (2012) Psychological management of stroke. Wiley: Chichester, UK.
2. Hackett ML, Kessler S, O'Brien JT, Mead GE (2014) Neuropsychiatric outcomes of stroke. *Lancet Neurology* 13: 525-534
3. Campbell Burton CA, Murray J, Holmes J, Astin F, Greenwood D, Knapp P (2013) Frequency of anxiety after stroke: a systematic review and meta-analysis of observational studies. *International Journal of Stroke* 8:545-559.
4. Menlove L, Crayton E, Kneebone I, Allen-Crooks R, Otto E, Harder H (2015) Predictors of anxiety after stroke: A systematic review of observational studies. *Journal of Stroke and Cerebrovascular Diseases* doi:10.1016/j.jstrokecerebrovasdis.2014.12.036
5. Jeong BO, Kang HJ, Bae KY, Kim SW, Kim JM, Shin IS, Kim JT, Park MS, Cho KH, Yoon JS (2012) Determinants of quality of life in the acute stage following stroke. *Psychiatry Investigation* 9:127-133.
6. Tang WK, Lau CG, Mok V, Ungvari GS, Wong K-S (2013) Impact of anxiety on health-related quality of life after stroke: a cross-sectional study. *Archives of Physical Medicine and Rehabilitation* 94:2535-2541.
7. Astrom M (1996) Generalized anxiety disorder in stroke patients: a 3-year longitudinal study. *Stroke* 27:270-275.
8. D'Alisa S, Baudo S, Mauro A, Miscio G (2005) How does stroke restrict participation in long-term post-stroke survivors? *Acta Neurologica Scandinavica* 112:157-162
9. Royal College of Physicians (2012) National clinical guidelines for stroke (4th ed.). London: Author.
10. Davies KN, Burn WK, McKenzie FR, Brothwell JA, Wattis JP (1993) Evaluation of the Hospital Anxiety and Depression Scale as a screening instrument in general medical inpatients. *International Journal Geriatric Psychiatry* 8:165-169
11. Pachana NA, Gallagher-Thompson D, Thompson LW (1994) Assessment of depression. In P Lawton and J Teresi (Eds.) *Annual Review of Gerontology and Geriatrics: Focus on Assessment Techniques* (Vol. 14, pp. 234-56). New York: Springer
12. Serrano S, Domingo J, Rodríguez-García E, Castro MD, del Ser T (2007) Frequency of cognitive impairment without dementia in patients with stroke. *Stroke* 38:105-110
13. Pachana NA, Byrne GJ, Siddle H, Koloski N, Harley E, Arnold E (2007) Development and validation of the Geriatric Anxiety Inventory. *International Psychogeriatrics* 19:103-114.
14. Zigmond AS and Snaith RP. The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scand* 1983; 67: 361-370
15. First MB, Spitzer RL, Gibbon M and Williams JBW. *Users guide for the Structured Clinical Interview for DSM-IV Axis 1 Disorders: Research Version*. Washington DC: American Psychiatric Association, 1997.
16. DeLong E, DeLong D, Clarke-Pearson D (1988) Comparing the areas under two or more correlated receiver operating characteristic curves: A non-parametric approach. *Biometrics* 44:837-845.
17. Kneebone, I. I., Fife-Schaw, C., Lincoln, N. B., & Harder, H. (2016). A study of the validity and the reliability of the Geriatric Anxiety Inventory in screening for anxiety after stroke in older inpatients. *Clinical rehabilitation*, 0269215515619661.

We are the Stroke Association

The Stroke Association is the leading stroke charity in the UK. We believe in the power of research to save lives, prevent stroke and ensure that people make the best recovery they can after a stroke.

We're here for you. If you'd like to know more, please get in touch.

Stroke Helpline: 0303 3033 100

Website: stroke.org.uk

Email: info@stroke.org.uk

From a textphone: 18001 0303 3033 100

Our research programme relies on voluntary donations.

Please help us to fund more vital research.

Call our Donations line on **0300 3300740**,
or visit stroke.org.uk

Together we can conquer stroke