



Blood pressure lowering treatment for preventing dementia in patients with a history of stroke: A systematic review and meta-analysis

Sarah Kemshall¹, E. Korompoki², J. Kerry³, S. Ramachandran¹, J. Davies¹, H. Milionis⁴, G. Ntaios⁵, J. Thomson¹, V. Papavasileiou¹

1. Stroke Service, Department of Neurosciences, Leeds Teaching Hospitals NHS Trust, UK

- 2. Department of Clinical Therapeutics, National and Kapodistrian University of Athens, Greece
- 3. Library and Information Service, Leeds Teaching Hospitals NHS Trust, UK
- 4. Department of Internal Medicine, School of Medicine, University of Ioannina, Ioannina, Greece

5. Department of Medicine, Larissa University Hospital, School of Medicine, University of Thessaly, Larissa, Greece

Background/objectives: This study aims to assess whether intensive blood pressure lowering treatment is superior to less intensive management or placebo in preventing dementia in patients with stroke.

Methods: A comprehensive literature search including PubMed, Medline and Embase was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. We searched for randomized trials which compared intensive versus less intensive (or placebo) blood pressure management in stroke patients reporting cognitive outcomes. Primary outcome of interest was dementia as defined by Mini Mental State Examination (MMSE) testing cut-offs.

Results: Among 614 potentially eligible articles, 4 randomized controlled trials were included (PROGRESS 2003, PRoFESS 2008, SCAST 2013, CATIS 2016); n=23,852.

Results (continue):

There was no statistically significant difference between intensive blood pressure lowering treatment compared with the control arm on post-stroke low MMSE scores (odds ratio, OR: 0.99, 95% confidence interval, CI: 0.92–1.07; heterogeneity $I^2=0\%$) (Figure).Subgroup analyses revealed a non-significant effect on low MMSE scores for hyperacute (OR: 1.00, 95%CI: 0.81–1.22; heterogeneity $I^2=0\%$) and delayed blood pressure treatment (OR: 0.99, 95%CI: 0.92–1.07; heterogeneity $I^2=35\%$). Finally, in participants with a recurrent stroke there was no effect of blood pressure management on low MMSE (OR: 0.86, 95%CI: 0.69–1.08; heterogeneity $I^2=66\%$) (Figure).

<u>Conclusions</u>: Taking into consideration the limitations of available evidence, this meta-analysis does not support the hypothesis that the implementations of an intensive blood pressure management prevents dementia after stroke.

A	Intensive BP control		Less intensive BP control		Odds Ratio		Odds Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% Cl	M-H, Fixed, 95% Cl	
CATIS 2016	96	314	96	324	4.8%	1.05 [0.75, 1.47]] –	
PRoFESS 2008	1178	7739	1162	7726	71.6%	1.01 [0.93, 1.11]] 📫	
PROGRESS 2003	193	3051	217	3054	14.8%	0.88 [0.72, 1.08]] –	
SCAST 2013	146	830	147	814	8.9%	0.97 [0.75, 1.25]	1 -	
Total (95% CI)		11934		11918	100.0%	0.99 [0.92, 1.07]		
Total events	1613		1622					
Heterogeneity: Chi ² =	: 1.67, df = 3 (P :	= 0.64); l ^z :	= 0%					
Test for overall effect: Z = 0.20 (P = 0.84)							0.01 0.1 1 10 100 Favours experimental Favours control	

Study or Subgroup	Intensive BP control		Less intensive BP control		Odds Ratio		Odds Ratio	
	Events	Total	Events	Total	Weight	M-H, Fixed, 95% Cl	M-H, Fixed, 95% (<u>a</u>
PRoFESS 2008	127	500	141	554	60.9%	1.00 [0.76, 1.32]] 📫	
PROGRESS 2003	43	3051	65	3054	39.1%	0.66 [0.45, 0.97]]	
Total (95% CI)		3551		3608	100.0%	0.86 [0.69, 1.08]	ı ♦	
Total events	170		206					
Heterogeneity: Chi ² = Test for overall effect:			= 66%				0.01 0.1 1 Favours experimental Favour	10 100

Figure: Forest plot of the effects of intensive vs less intensive blood pressure lowering treatment on post-stroke low MMSE scores. A) General stroke population, B) Patients with recurrent stroke

The PROGRESS Collaborative Group. Arch Intern Med. 2003;163:1069-1075 H.C. Diener et al. Lancet Neurol. 2008 October ; 7(10): 875–884 A.G. Hornslien et al. Stroke. 2013;44:2022-2024 X. BU et al. Int J Stroke. 2016 Dec;11(9):1009-1019

Contact details: Ms Sarah Kemshall; sarah.kemshall@nhs.net Dr Vasileios Papavasileiou; v.papavasileiou@nhs.net