

# Medical procedure-related transient global amnesia: Predisposing conditions and individual susceptibility

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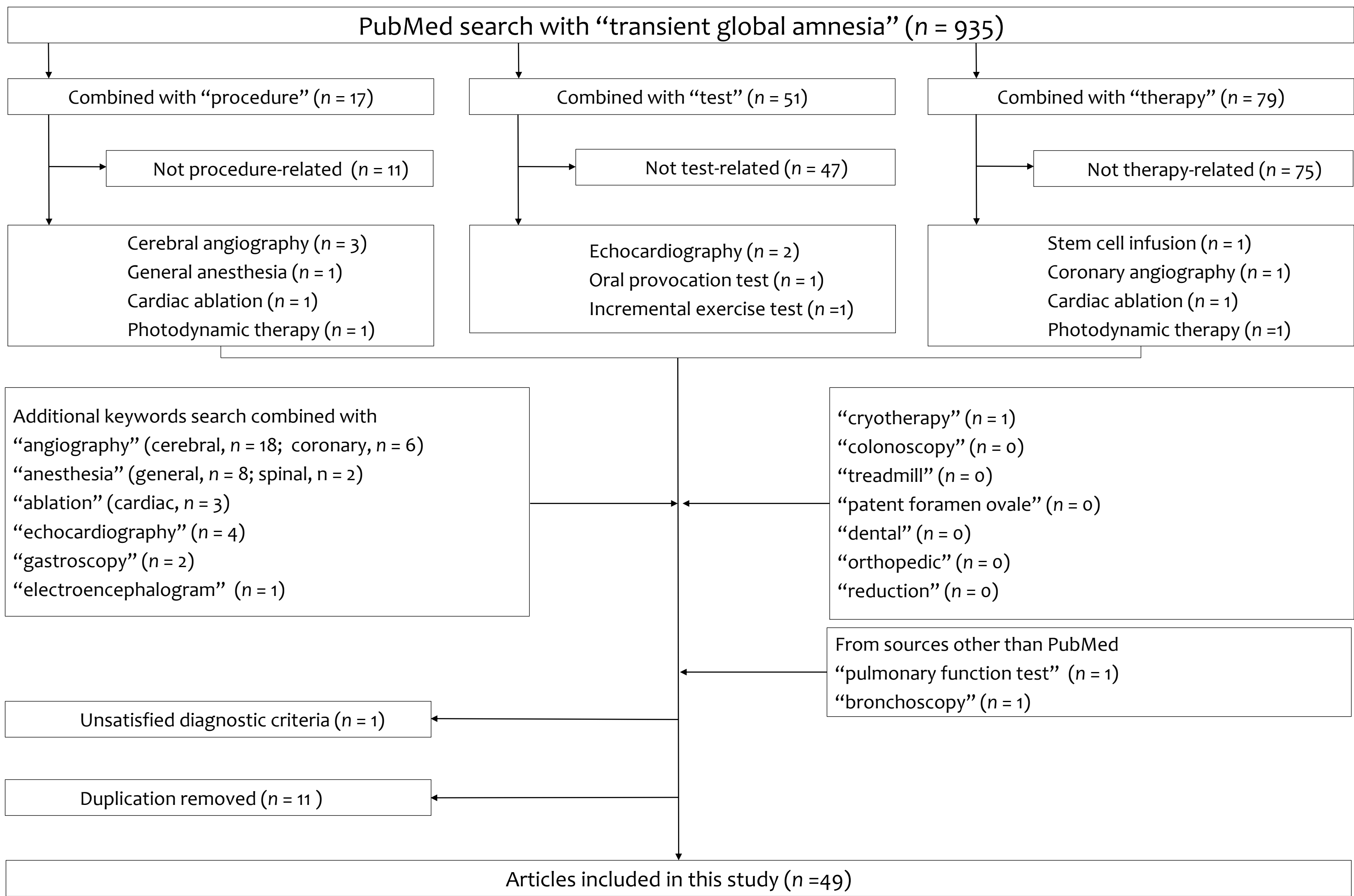
INTRODUCTION

- Transient global amnesia (TGA) is an interesting clinical syndrome characterized by sudden memory loss for recent events and an inability to retain new memories usually lasting several hours and recovering spontaneously.
- Many cases of TGA have followed Valsalva-associated activities, such as nausea, vomiting, swimming, crying, taking a cold shower, coughing, emotional stress, exercise, and acute pain.
- Numerous medical procedures are related to Valsalva-associated activities and stressful conditions. Several medical procedures include the Valsalva maneuver in their protocols. Therefore, they may act as predisposing conditions for TGA.

METHODS

*Literature Search*

We searched all available literature published before December 2017 using PubMed, which contains over 27 million references, including the MEDLINE database plus in-process citations and ahead-of-print citations.



RESULTS

The most common medical procedure associated with TGA was cerebral angiography ( $n = 45$ ), followed by coronary angiography ( $n = 10$ ) and general anesthesia ( $n = 9$ ). The diverse medical procedures were categorized in terms of procedure type: neurological procedures were the most common ( $n = 46$ , 51.7%), followed by cardiac procedures ( $n = 17$ , 19.1%), anesthetic procedures ( $n = 11$ , 12.4%), gastrointestinal procedures ( $n = 4$ , 4.5%), and pulmonary procedures ( $n = 2$ , 2.2%).

CONCLUSION

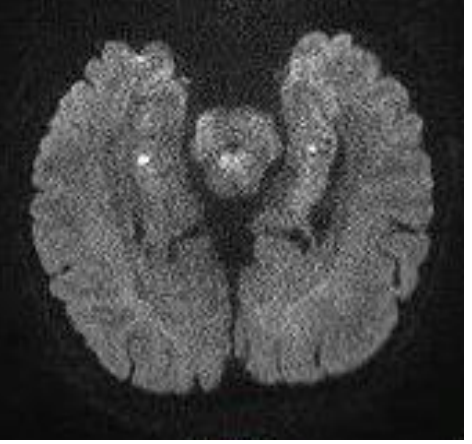
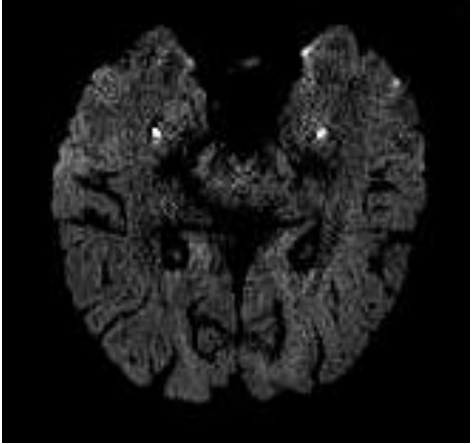
The present study summarized the reports of medical procedure-related TGA in the literature. Although the exact mechanisms of medical procedure-related TGA remain to be elucidated, Valsalva-associated activities, emotional stress, and acute pain may be predisposing conditions. An understanding of medical procedure-related TGA is important for clinicians who perform such procedures.

Medical procedures	Age, years	Female, n	Premedication, n	Valsalva-associated activities	DWI*
<b>Neurological procedures</b>					
Cerebral angiography (n=45)	53±13	17	Midazolam + propofol (1) Ambarbital (1) Diazepam or oxazepam (10)	Acute puncture pain, anxiety, nausea, vomiting	4/7
Electroencephalogram (n=1)	53	0	None	Hyperventilation	0/0
<b>Cardiac procedures</b>					
Coronary angiography (n=10)	62±14	4	Midazolam (1) Midazolam + atropine (1) Temazepam (1)	Acute puncture pain, anxiety, nausea, vomiting	1/4
Echocardiography (n=5)	63±9	5	Atropine (2)	Valsalva maneuver	0/5
Cardiac ablation (n=2)	45±19	1	Midazolam + methohexial (1)	Acute puncture pain, anxiety, nausea, vomiting	0/1
<b>Anesthetic procedures</b>					
General anesthesia (n=9)	57±14	2	Combination of alprazolam, diazepam, midazolam, thiamylal, thiopental, atropine, propofol, desflurane, seveflurane, isoflurane, fentanyl, morphine, hydromorphone (9)	Coughing during extubation, large levels of negative pressure by patient during extubation, positive end expiratory pressure	0/0
Spinal anesthesia (n=2)	66±5	2	Atropine (1)	None	0/0
<b>Gastrointestinal procedures</b>					
Gastroscopy (n=4)	64±8	4	Scopolamine (2)	Discomfort or rapid gastric dilatation, nausea, vomiting, cough	0/2
<b>Pulmonary procedures</b>					
Pulmonary function test (n=1)	60	1	None	Deep breath, breath holding	0/0
Bronchoscopy (n=4)	77	1	Unknown	Cough	0/0
<b>Miscellaneous procedures</b>					
Photodynamic therapy (n=5)	68±13	2	Codeine (2)	Pain on the skin	1/2
Incremental exercise test (n=1)	71	0	None	Exercise	0/0
Oral provocation (n=1)	64	1	None	None	1/1
Whole-body cryotherapy (n=1)	63	0	None	Sudden exposure to cold air	0/1
Stem cell infusion (n=1)	30	0	None	None	1/1
Total (n=89)	57±13	40 (44.9%)	32 (36.0)	85/89 (95.5)	8/24 (33.3)
DWI, diffusion-weighted MRI; *mean±SD, years; **number of patients showing dot-like hippocampal hyperintensities in DWI/Number of patients who underwent DWI within 72 h of onset.					

### Representative 2 cases of gastroscopy-related TGA

Case1  
70 female  
Past history : HTN  
Chief complaint : sudden onset of amnesia  
Present illness : Sudden onset of amnesia developed after unsedated gastroscopy. She could not remember what she had just been told but recognized her grand-daughter and recalled the name of her hometown. Her memory began to recover gradually within 8 hours but some permanent memory lapse of the events during the procedure remained.  
She satisfied the clinical diagnostic criteria for TGA.  
Premedication : cimetropium bromide 5mg IV

Case 2  
67 female  
Past history : diabetes mellitus  
Chief complaint : sudden onset of amnesia  
Present illness : A few minutes after the procedure, she repeatedly asked where she was and why she was there. She could not remember coming to the clinic or undergoing the gastroscopy. Her amnesia began to recover within 4 hours of admission.  
Premedication : cimetropium bromide 5mg IV



**Figure 1.** diffusion-weighted MRI (DWI) 24 h after the onset of TGA of case 1. Bilateral dot-like hippocampal hyperintensities

**Figure 2.** DWI was performed 60 h after the onset of TGA of case 2. Bilateral dot-like hippocampal hyperintensities

REFERENCES

Jeong M, Kim W, S, Kim A, Park J, J, Choi D, -H, Kim H, Y: Medical Procedure-Related Transient Global Amnesia. Eur Neurol 2018;80:42-49. doi: 10.1159/000493163