

Supplementary Material for

Post-stroke psychosis: a systematic review

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Methods

Databases and search strategy

CINAHL, MEDLINE and PsychINFO were electronically searched from January 1975 to December 2016. We judged the 1st of January 1975 to be a natural starting date for the search, as studies published prior to this date are unlikely to involve neuroimaging techniques that provide critical information for this type of research, i.e. CT scans. The final search was completed on 9 December 2016. The search strategy was limited to only include studies published in English and studies assessing human participants.

Full search strategy

CINAHL (EBSCO), MEDLINE (OVID) and PsychINFO (OVID)

1. (((stroke or poststroke or post-stroke or cerebrovasc* or "cerebral vasc*" or CVA or apoplex* or SAH or ischemic* or ischaemic* or hemorrhage* or haemorrhage* or "transient ischemic attack" or "transient ischaemic attack" or TIA) and (psychosis or psychotic or delus* or hallucin* or paranoi* or schizophren*)) not dementia).mp.

2. limit 1 to (english language and humans and yr="1975 -Current")

MEDLINE (OVID) example

Search strategy

1. stroke/
2. poststroke/
3. post-stroke/
4. cerebrovasc\$.tw.
5. cerebral vasc\$.tw.
6. CVA/
7. apoplex\$.tw.
8. SAH/
9. ischemic\$.tw.
10. ischaemic\$.tw.
11. hemorrhage\$.tw.
12. haemorrhage\$.tw.
13. 'transient ischemic attack' /
14. 'transient ischaemic attack'
15. TIA/
16. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15
17. psychosis/

18. psychotic/
19. delus\$.tw.
20. hallucin\$.tw.
21. paranoi\$.tw.
22. schizophren\$.tw.
23. 17 or 18 or 19 or 20 or 21 or 22
24. dementia/
- 25.16 and 23 not 24

Data extraction and quality assessment

Two reviewers independently screened the titles and abstracts of the literature identified by the search strategy described above, excluding studies that did not meet the inclusion criteria. During this process any study whose eligibility could not be determined after having reviewed the title and abstract was obtained via full text format, and included in the next stage of the search process. The full text of the remaining studies were then screened by the same reviewers and again excluded if they did not meet the inclusion criteria. Any uncertainty or disagreement about the studies at this stage was discussed between the two reviewers in order to reach consensus, or with the third author.

Finally, two reviewers used a standardised extraction form to extract relevant data from the included studies. Data was extracted with respect to study design, patient setting and patient characteristics, including age and number of participants, and whether or not the participants had been diagnosed with a psychiatric disorder prior to having a stroke. Moreover, information regarding each study's inclusion and exclusion criteria, comparison group or condition, and diagnostic assessment was extracted. Specifically, information about stroke subtype, lesion location, as well as time of onset and description of psychosis was obtained. If a study explored treatment interventions the method for assessing treatment outcomes was also extracted, as was each study's primary outcome and other outcomes. No authors were contacted for additional information.

Quality assessment was conducted using a revised version of the STROBE checklist for evaluating observational studies. Ten items were adapted from the STROBE checklist as there is currently no consensus about what assessment tool is appropriate to use for qualitative studies. Each item was scored either "Yes" or "No" by two reviewers and a global score was calculated for each item. The quality assessment is available below.

Results

Reasons for exclusion

After having screened the titles and abstracts of the studies identified by the search strategy, 198 were identified as potentially eligible. Out of these, 122 studies were excluded after having been obtained the full text, as they did not meet the inclusion criteria for the review. 41 of these studies were excluded because they did not meet the inclusion criteria for psychosis. Typically these studies involved non-psychotic hallucinatory symptoms due to sensory impairments, such as Charles Bonnet syndrome, or delusions relating to body ownership or body awareness, such as somatoparaphrenia and anosognosia. A total of 35 studies were excluded because the causation between stroke and psychosis was unclear, for example where patients were presenting with a comorbid neurodegenerative disease. A further 18 studies were excluded because they did not involve psychosis, and 13 studies were excluded due to unclear psychosis definitions, such as symptoms presented being representative of affective disorders rather than psychosis. We excluded 6 studies because they did not involve stroke pathology and 5 studies because they did not include CT or MRI scans to verify a diagnosis of stroke. Finally, 3 studies were excluded because they were reviews and did not report any original data, and 1 study was a personal account.

Meta-analysis of prevalence

Three studies reported prevalence of delusions and hallucinations in stroke patients. Kumral and Öztürk (2004) reported on delusions in a sample of acute stroke patients, Buijck et al (2011) reported prevalence rates for delusions and hallucination on admission and discharge in a sample of geriatric patients admitted for stroke rehabilitation, and van Almenkerk et al (2012) reported prevalence rates of delusions and hallucinations in a sample of institutionalized stroke patients. To estimate cross-sectional prevalence we only included prevalence at the point of admission from Buijck et al (2011).

It is worth noting differences in the included studies. Buijck et al (2011), van Almenkerk et al (2012) and Wong et al (2016) used the Neuropsychiatric Inventory Questionnaire to assess symptoms in patients admitted for stroke rehabilitation, or in the case of Wong et al (2016), patients admitted acutely but assessed 3-6 months after stroke and in the rehab phase, whereas Kumral and Öztürk (2004) reported ratings of delusions from clinical judgment based on DSM-IV criteria in patients admitted for acute stroke treatment.

Data from these studies were analysed using the *meta* package (version 4.8.4) for *R* statistics (version 3.4.2) on a 64-bit linux x86 platform. Freeman-Tukey double arcsine transformation was used to calculate the weighted summary proportion under the fixed and random effects models with normal approximation confidence intervals for individual studies. The *R* analysis script and data have been made freely available on Open Science Framework archive for this analysis: <https://osf.io/kzht6/>

The formal test of heterogeneity for data included in the analysis was significant. Because of this, estimated prevalence was based on more conservative estimates from the random effects model throughout. Results from this meta-analysis are reported in Figure 2 of the main manuscript.

Because of the methodological differences in Kumral and Öztürk (2004) and concerns about adequate screening for patients with alterations in their levels of consciousness, not least because they various report patients with agitation and two specifically with confusional states, we also

report meta-analytic results with this study removed, using the same methods, in Figure S1 below, leading to very similar estimates of prevalence.

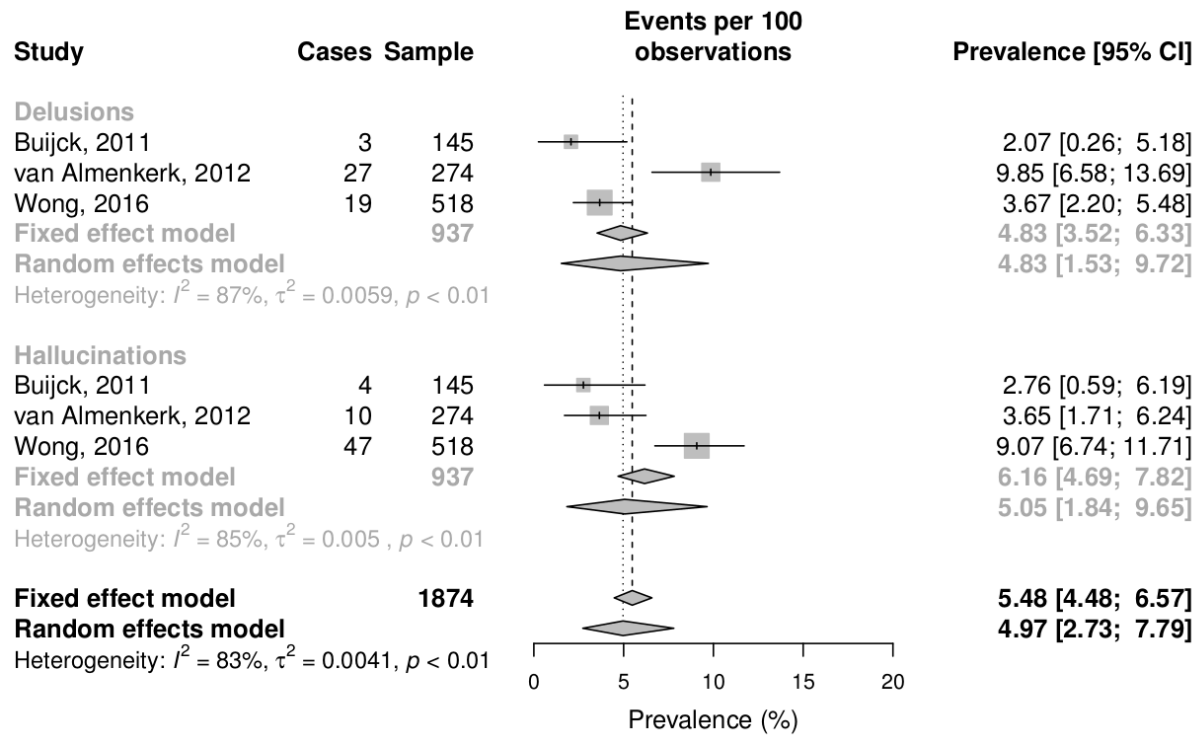


Figure S1. Forest plot of post-stroke delusion and hallucination prevalence with Kumral and Öztürk (2004) removed

Quality assessment of the case series and quantitative studies

All of the 18 studies included an adequate description of the setting and location of the studies, and specified the eligibility criteria and sources and methods for the selection of the participants. A total of 13 (72.2%) studies included definitions of psychosis as measured by diagnostic criteria, and 6 (33.3%) specified the diagnostic criteria used to diagnose stroke. In 11 (61.1%) of the studies stroke data were obtained from a patient or proxy, whereas in 7 (38.9%) stroke data was collected from a database. A total of 11 (61.1%) studies clearly defined their neuroimaging findings, and 3 (75%) of the eligible studies included a blinded investigator. We found that 17 (94.4%) of the studies adequately reported the number of participants at each stage of the study. All of the studies reported appropriate descriptive and outcome data. Finally, 6 (50%) of the eligible studies provided unadjusted estimates and their precision (e.g. 95% confidence interval) in their main results. Full results are displayed in Table 3.

Table 1. Characteristics of included single case reports

H = Haemorrhagic; I = Ischaemic; n/a = Not available; CBT* = Cognitive Behavioural Therapy

| Reference | Age/Sex | Stroke | Psychosis type | Onset | Lesion | Treatment | Outcome |
|--------------------------------|---------|--------|--|-------|---|-------------------------|--------------------|
| Akinci, Oncu & Topcular (2016) | 61/M | I | Persecutory delusions and tactile hallucinations | n/a | Right temporo-parietal-occipital region | n/a | Partial resolution |
| Almeida et al. (2011) | 20/F | H | Schizophrenia- like | 1y | Right cerebellar hemisphere | Clozapine, valporate | Partial resolution |
| Anderson et al. (1998) | 48/F | H | Erotomania | 4y | Right fronto-parietal region | Risperidone, sertraline | n/a |
| Barboza et al. (2013) | 54/F | I | Persecutory delusions | 1y | Right fronto-temporo-parietal region | Quetiapine | Partial resolution |
| Bieganska & Janic (2015) | 70/M | I | Paranoid delusions of reference and delusions of control | n/a | Right putamen, corona radiata and caudate nucleus | n/a | n/a |
| Bouckoms et al. (1986) | 66/F | H | Capgras syndrome | n/a | Right frontal region | None | Partial resolution |

| | | | | | | | |
|------------------------------|------|---|---|------|---|--|---------------------|
| Celik et al. (2004) | 69/F | I | Mania with mood congruent psychotic symptoms | 2d | Right temporo-parietal region | Carbamazepine | Partial resolution |
| Chae et al. (2006) | 63/M | I | Othello syndrome | 3.5y | Right fronto-parietal region and right basal ganglia | Quetiapine, zolpidem | Partial resolution |
| Chiu (1995) | 78/F | H | Auditory and sensory hallucinations and secondary persecutory delusions | 10d | Right occipital lobe and right superior-posterior parietal region | Haloperidol | Complete resolution |
| Crail-Melendez et al. (2013) | 37/F | I | Schizophrenia-like | n/a | Right thalamus | Risperidone | Complete resolution |
| Das et al. (2005) | 65/F | I | Erotomania | n/a | Fronto-temporal region, unspecified | Olanzapine and psycho-therapy | Partial resolution |
| Dayus & van den Broek (2000) | 42/M | H | Stable delusional confabulations | n/a | Right caudate nucleus | Sulpiride, fluoxetine and self-monitoring training (SMT) | Partial resolution |

| | | | | | | | |
|--------------------------------|------|---|--|-----|---|-------------|---------------------|
| Delgado & Bogousslavsky (2013) | 48/F | I | Auditory distortions | n/a | Bilateral thalamus (predominating right dorsomedial nucleus region) | None | Complete resolution |
| Dhasmana et al. (2010) | 28/F | I | Psychosis, unspecified | 1w | Left transverse sinus | None | Complete resolution |
| Floris et al. (2008) | 70/M | H | Delusional parasitosis and visual hallucinations | 5m | Left fronto-parietal region | Olanzapine | Partial resolution |
| Flynn et al. (1989) | 67/M | I | Delusional parasitosis and auditory hallucinations | n/a | Right fronto-parietal region | Amoxapine | No improvement |
| Fonseca et al. (2013) | 72/M | I | Cotard's syndrome | 2m | Right fronto-temporo-parietal region | None | Complete resolution |
| Gnanavel (2013) | 8/M | I | Paranoid delusions and auditory hallucinations | n/a | Left fronto-temporo-parietal region | Risperidone | Partial resolution |
| Hanihara et al. (2009) | 64/F | I | Delusional parasitosis | 3m | Right cerebellum and left thalamic region | Sulpiride | Partial resolution |

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|---------------------------------|------|-----|---|-----|--|--|---------------------|
| Hinkebein et al. (2001) | 67/M | H | Reduplicative paramnesia | 2w | Right fronto-temporo-parietal region | Family psycho-education, CBT | Partial resolution |
| Hudson et al. (2000) | 71/F | I | Fregoli syndrome and reduplicative paramnesia | 1w | Right temporal region | n/a | n/a |
| Jocic et al. (1993) | 67/M | I | Fregoli's syndrome and reduplicative paramnesia | 15d | Right fronto-temporal region and right basal ganglia | Nortriptyline | Partial resolution |
| Kato et al. (2006) | 64/F | I | Somatic delusions | 4y | Right caudate nucleus | Antipsychotic drugs, unspecified | No improvement |
| Kitabayashi et al. (2006) | 40/F | I | Schizophrenia-like | n/a | Right putamen, caudate and insula | Risperidone | Complete resolution |
| Klasen, Britton & Newman (1999) | 12/M | I | Schizophrenia-like | n/a | Left basal ganglia region | Diazepam, chlorpromazine and trifluoperazine | Complete resolution |
| Lee et al. (2011) | 69/M | n/a | Reduplicative paramnesia | 2m | Right frontal region and right caudate nucleus | n/a | No improvement |

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|-----------------------------|--------------------|--------------|--|------------------|--|---|-------------------------------------|
| Leeds et al. (2011) | 71/F | I | Cotard's syndrome | n/a | Right thalamus | Antipsychotic drugs, unspecified | Complete resolution |
| Meguro et al. (2012) | 77/M | I | Erotomania and Othello syndrome | n/a | Left head of the caudate nucleus | Risperidone, levomepromazine | Partial resolution |
| Mishra et al. (2008) | 42/M | I | Paranoid delusions and visual hallucinations | 2y | Bilateral occipital region | Phenytoin sodium, sodium valporate | n/a |
| Mittal & Khan (2010) | 19/F | I | Paranoid delusions and auditory hallucinations | n/a | Left ventro-anterior thalamic nucleus | Haloperidol, olanzapine, risperidone and aspirin | 1: Died from complications |
| Mobbs et al. (2001) | 1: 34/M 2: 59/F | 1: H 2: H | 1: Thought disorder 2: Persecutory delusions | 1: n/a 2: n/a | 1: n/a 2: n/a | 1: None 2: None | 1: n/a 2: Complete resolution |
| Moriyama et al. (2007) | 68/F | I | Fregoli syndrome | 2m | Right temporo- occipital region | Risperidone | Complete resolution |
| Nagaratnam et al. (2000) | 1: 69/F 2: 65/F | 1: I 2: I | 1: Delusional parasitosis 2: Delusional parasitosis | 1: 6m 2: 3w | 1: Left temporo- occipital region 2: Left temporo- occipital region | n/a | n/a |

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|------------------------|------|-----|---|-----|---------------------------------------|--|---------------------|
| Narumoto et al. (2005) | 55/F | I | Persecutory delusions and visual hallucinations | n/a | Bilateral head of the caudate nucleus | Haloperidol | Partial resolution |
| Narumoto et al. (2006) | 82/F | I | Delusional parasitosis and visual hallucinations | 1m | Right temporo-parietal region | Risperidone | Complete resolution |
| Neetesh et al. (2012) | 49/F | H | Othello syndrome | 2m | Right basal ganglia | Risperidone | Complete resolution |
| Ohara et al. (2006) | 56/F | n/a | Auditory hallucinations | 4m | Left temporal and parietal region | Haloperidol | Complete resolution |
| Ortiz et al. (2004) | 30/M | I | Depression with mood congruent psychotic symptoms | n/a | Left para-hippocampal gyrus | Clomipramine, citalopram, venlafaxine, haloperidol, risperidone, clozapine, olanzapine | Partial resolution |
| Pakalnis et al. (1987) | 52/F | I | Capgras syndrome and visual hallucinations | 1d | Right parieto-occipital region | Haloperidol | Complete resolution |

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|---|--------------------|--------------|---|----------------|--|---|--|
| Peckins, Khorashadi & Wolpow (2016) | 88/F | I | Reduplicative paramnesia | 8d | Medial right thalamus | n/a | Complete resolution |
| Perez et al. (2014) | 73/F | H | Cotard's syndrome | n/a | Right fronto- parietal region | Levetiracetam | Complete resolution |
| Richardson et al. (1991) | 68/M | I | Othello syndrome | 2m | Right fronto- temporo-parietal region | Haloperidol, phenytoin, and sexual counseling | No improve- ment |
| Richardson (1992) | 64/M | I | Unspecified delusions and visual hallucinations | n/a | Right temporo- parieto-occipital region and left cerebellum | Haloperidol | Partial resolution |
| Rocha et al. (2014) | 1: 65/M 2: 69/M | 1: I 2: I | 1: Othello syndrome and persecutory delusions 2: Othello syndrome | 1: 1w 2: 1d | 1: Right temporo- parieto-insular region 2: Right temporo- parieto-insular region | 1: Fluvoxamine, chlorpromazine 2: Quetiapine, sertraline | 1: Complete resolution 2: Complete resolution |

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|---------------------------|--------------------|--------------|---|------------------|---|---|--|
| Routh & Hill (2014) | 83/M | H | Mania with paranoid delusions | n/a | Right posterior thalamus region | Olanzapine | Complete resolution |
| Santos et al. (2009) | 1: 67/M 2: 49/M | 1: I 2: I | 1: Delusions of self-reference and persecutory delusions 2: Gustatory hallucinations and persecutory delusions | 1: n/a 2: n/a | 1: Right caudate nucleus 2: Left thalamus | 1: Quetiapine, benzodiazepines, unspecified 2: Quetiapine and psychotherapy | 1: Complete resolution 2: Complete resolution |
| Schnider et al. (1993) | 54/M | n/a | Mania with mood congruent psychotic symptoms | n/a | Right temporo- parieto-occipital region | n/a | Partial resolution |
| Small (2016) | 57/F | I | Visual and tactile hallucinations | 2y | Pontine region | Quetiapine | Complete resolution |
| Sottile et al. (2015) | 30/F | I | Capgras syndrome and Cotard's syndrome | n/a | Left temporo- parietal region | Olanzapine and psychotherapy | Complete resolution |
| Spiegel et al. (2008) | 54/F | I | Capgras syndrome | 1w | Right frontal region | Mirtazepine, ziprasidone | Partial resolution |
| Suhr et al. (1998) | 52/F | I | Unspecified delusions and auditory hallucinations | 10y | Right temporo- parieto-occipital region | Phenytoin, psychoeducation and CBT* | Partial resolution |

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|--------------------------|------|---|--|-----|-----------------------------------|--------------------------|---------------------|
| Thiel et al. (2014) | 70/F | H | Capgras syndrome | n/a | Right frontal region | n/a | n/a |
| Villarejo et al. (2011) | 90/M | I | Mirrored-self misidentification and reduplicative paramnesia | 1w | Right frontal region | None | No improvement |
| Westlake & Weeks (1999) | 20/F | H | Depression with Othello syndrome | 5y | Right parietal and frontal region | Paroxetine | Partial resolution |
| Wong et al. (1997) | 72/M | I | Othello syndrome | 1d | Right caudate nucleus and putamen | Nortriptyline | Partial resolution |
| Wunderlich et al. (2000) | 24/F | I | Visual hallucinations | 2w | Parietal-occipital cortex | None | Complete resolution |
| Yildiz et al. (2007) | 56/M | H | Schizophrenia-like | 6m | Left fronto-parietal region | Diazepam and haloperidol | Partial resolution |
| Zimnitzky et al. (1996) | 19/M | I | Schizophrenia-like | n/a | n/a | Risperidone | Partial resolution |

Table 2. Characteristics of included case series and quantitative studies

NPS* = Neuropsychiatric symptoms; n/a = Not available; RC = retrospective cohort study; PC = prospective cohort study; CS = case series; CrS = cross sectional study

| Reference | Study design | Setting | Sample | Exclusion | Comparator | Primary outcome |
|----------------------|---------------------|--------------------------------|---|---|---|--|
| Almeida (2007) | RC | Community, Australia | Stroke survivors with a first ever stroke in 1990 (N = 1008) | Previous psychiatric disorder | Matched controls without NPS* (N = 287) | Incidence and 10-year mortality of NPS* after stroke |
| Buijck et al. (2012) | PC | Nursing homes, The Netherlands | Geriatric patients admitted for stroke rehabilitation (N = 145) | Unwillingness to give informed consent, legally incapable, expected to be discharged within 2 weeks, critically ill | n/a | Prevalence and course of NPS* after stroke |

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|----------------------|----|---------------------------|--|---|---|--|
| Devine et al. (2014) | CS | Hospital, London | Patients with post-stroke psychosis (N = 3) | n/a | Patients with similar anatomical damage (N = 9) | To identify the neuroanatomical basis of psychosis following stroke |
| Flint et al. (1991) | CS | Hospital, Canada | Patients with late-onset paraphrenia (N = 21) | Previous psychiatric history of psychosis or affective disorders, comorbid neurological disease | Patients with late-onset paranoia (N = 12) | To determine the course of late-onset paranoia compared to paraphrenia |
| Giltay et al. (2006) | RC | Hospital, The Netherlands | Patients undergoing cardiac surgery (N = 8139) | n/a | Patients without psychotic symptoms (N = 7971) | Presence of psychotic symptoms after cardiac surgery |

| | | | | | | |
|-------------------------|----|---|---|---|--|--|
| Hoffmann (2008) | CS | Stroke registry, United States | Isolated right temporal stroke patients (N = 5) | Extratemporal involvement by the lesion, coma, cerebral trauma, encephalopathy, substance abuse, neurodegenerative disease, medication related effects | Isolated left temporal stroke patients (N= 5) | Prevalence of temporal and frontal cognitive and neuropsychiatric syndromes in isolated right and left stroke patients |
| Kumral et al. (2004) | CS | Hospital, Turkey | First ever stroke patients with delusions (N = 15) | Previous psychiatric disorder, substance abuse, transient and intermittent behavioural abnormality after a seizure | n/a | To define delusional themes and anatomical patterns of delusions after stroke |

| | | | | | | |
|-------------------------|----|--|---|--|---|--|
| Levine et al. (1984) | CS | Hospital, United States | Stroke patients with right cerebral infarcts and delusions (N = 9) | Comorbid neurological disease, medication related effects, congestive heart failure, respiratory failure | Stroke patients with right cerebral infarcts without delusions (N = 16) | To identify the nature and causes of delusions after infarction of the right cerebral hemisphere |
| McMurtray et al. (2008) | CS | Veterans memory disorder clinic, United States | Patients with content-specific delusions after right caudate stroke (N = 8) | Previous psychiatric and medical conditions that could affect cognition, medication related effects | Matched controls without stroke or delusions (N = 8) | Association with prefrontal hypometabolism |

| | | | | | | |
|------------------------|----|-------------------------|--|--|---|---|
| Murai et al. (1997) | CS | Hospital, Japan | Patients with focal brain damage and reduplicative paramnesia (N = 6) | No CT or MRI, previous psychiatric disorder, severe communication disturbances | n/a | To identify the prevalence and course of reduplicative paramnesia |
| Price & Mesulam (1985) | CS | Hospital, United States | Right-handed patients with right hemisphere infarcts and psychosis (N = 5) | n/a | n/a | Clinical features of psychosis due to cerebrovascular disease |
| Rabins et al. (1991) | CS | Hospital, United States | Patients with post-stroke psychosis (N = 5) | Previous psychiatric history of psychosis | Patients with the same lesion size and location without post-stroke psychosis (N = 5) | Risk factors for developing post-stroke psychosis |

| | | | | | | |
|---|-----|--------------------------------|--|--|-----|---|
| Ramirez-Bermudez, Espinola-Nadurille & Loza-Taylor (2010) | CS | Hospital, Mexico | Patients with neurological disease and delusional parasitosis (N = 4) | Patients without neurological disease | n/a | Clinical features and response to treatment |
| Su et al. (2001) | CS | Hospital, Taiwan | Patients with delusional disorder due to cerebrovascular disease (N = 7) | Previous psychiatric history or other non-vascular cortical/subcortical neurological disorders | n/a | Clinical features and MRI characteristics of delusional disorder due to cerebrovascular disease |
| van Almenkerk et al. (2012) | CrS | Nursing homes, The Netherlands | Stroke patients admitted for stroke rehabilitation (N = 274) | Incomplete questionnaires | n/a | Status of functioning and stroke characteristics |

| | | | | | | |
|-----------------------------|-----|--------------------------------|---|---|--|---|
| van Almenkerk et al. (2015) | CrS | Nursing homes, The Netherlands | Stroke patients admitted for stroke rehabilitation (N = 274) | Incomplete questionnaires | n/a | Prevalence of pain and its relation to emotional distress and low social engagement |
| Wong et al. (2016) | CrS | Hospital, Hong Kong | TIA and stroke patients 3–6 months post index admission (N = 518) | History of dementia, not able to complete cognitive testing | n/a | Neuropsychiatric Inventory, cognitive function, amyloid imaging |
| Zhang et al. (2015) | RC | Hospital, China | Ischaemic stroke patients one year after hemiplegia (N = 90) | n/a | Matched controls without stroke (N = 90) | To measure psychological distress, social support and medication adherence |

Table 3. Items selected for the assessment of the quality of the included group studies

| Methods | |
|-----------------------------|--|
| Setting | Description of the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection. |
| Participants | The eligibility criteria, and the sources and methods of selection of participants. For matched studies, matching criteria and the number of controls per case. |
| Variables | Definition of psychosis and stroke (including diagnostic criteria, if applicable). |
| Data source and measurement | a. Method for collecting stroke data (directly from the patient or database). b. Clearly defined CT/MRI measures. c. Investigator blinded to patient status. |

| Results | |
|------------------|---|
| Participants | Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed |
| Descriptive data | Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders. |
| Outcome data | Report numbers of outcome events or summary measures. |
| Main results | Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included. |

| Studies | Setting and location | Sources and methods for selection of participants | Data sources and measurement | | | | Participants | Descriptive data | Outcome data | Main results |
|------------------------|----------------------|---|-------------------------------|-----------------------------------|---------------------|----------------------|--------------|------------------|--------------|--------------|
| | | | Psychosis and stroke measures | Method for collecting stroke data | CT and MRI measures | Investigator blinded | | | | |
| Almeida (2007) | Yes | Yes | P: Yes S: Yes | Database | No | N/A | Yes | Yes | Yes | Yes |
| Buijck (2012) | Yes | Yes | P: Yes S: No | Patient | No | N/A | Yes | Yes | Yes | N/A |
| Devine (2014) | Yes | Yes | P: No S: No | Database | Yes | N/A | Yes | Yes | Yes | N/A |
| Flint (1991) | Yes | Yes | P: Yes S: No | Patient | Yes | Yes | Yes | Yes | Yes | No |
| Giltay et al. (2006) | Yes | Yes | P: No S: No | Database | No | N/A | Yes | Yes | Yes | Yes |
| Hoffmann (2008) | Yes | Yes | P: Yes S: Yes | Database | Yes | Yes | Yes | Yes | Yes | Yes |
| Kumral (2004) | Yes | Yes | P: Yes S: Yes | Patient | Yes | N/A | Yes | Yes | Yes | No |
| Levine (1984) | Yes | Yes | P: No S: No | Patient | No | N/A | Yes | Yes | Yes | No |
| McMurtray (2008) | Yes | Yes | P: No S: Yes | Database | No | N/A | Yes | Yes | Yes | No |
| Murai (1997) | Yes | Yes | P: Yes S: No | Patient | Yes | No | Yes | Yes | Yes | N/A |
| Price & Mesulam (1985) | Yes | Yes | P: No S: No | Patient | Yes | N/A | Yes | Yes | Yes | N/A |
| Rabins (1991) | Yes | Yes | P: Yes S: No | Patient | Yes | Yes | Yes | Yes | Yes | No |

| | | | | | | | | | | |
|---|-----|-----|--------------------|--|------|-----|------|-----|-----|-----|
| Ramirez-Bermudez, Espinola-Nadurille & Loza-Taylor (2010) | Yes | Yes | P: Yes S: No | Database | Yes | N/A | Yes | Yes | Yes | N/A |
| Su et al. (2001) | Yes | Yes | P: Yes S: No | Database | Yes | N/A | Yes | Yes | Yes | N/A |
| van Almenkerk (2012) | Yes | Yes | P: Yes S: No | Proxy | No | N/A | Yes | Yes | Yes | Yes |
| van Almenkerk (2015) | Yes | Yes | P: Yes S: No | Proxy | No | N/A | Yes | Yes | Yes | Yes |
| Wong et al. (2016) | Yes | Yes | P: Yes S: Yes | Patient | Yes | N/A | Yes | Yes | Yes | Yes |
| Zhang et al. (2015) | Yes | Yes | P: Yes S: Yes | Patient | Yes | N/A | No | Yes | Yes | No |
| Total (%) | 100 | 100 | P: 72.2 S: 33.3 | Database: 38.9 Patient/ proxy: 61.1 | 61.1 | 75 | 94.4 | 100 | 100 | 50 |

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