Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Database Search Strategy

Building block approach to search database

Altered mental status: "altered mental status"[tw] OR confusion[tw] OR disorientation OR unconscious*[tw] OR AMS[tw] CT head: "Tomography, X-ray Computed"[Mesh] OR "CT Head" OR CTH

PubMed/MEDLINE, PubMed Central

("altered mental status"[tw] OR confusion[tw] OR disorientation OR unconscious*[tw] OR AMS[tw]) AND ("Tomography, X-Ray Computed"[Mesh] OR "CT Head"[tw] OR CTH[tw])

PubMed/Medline: 2308 Hits

https://pubmed.ncbi.nlm.nih.gov/?term=%28%22altered+mental+status%22%5Btw%5D+OR+confusion%5Btw%5D+OR+disorientation+OR+unconscious* %5Btw%5D+OR+AMS%5Btw%5D%29+AND+%28%22Tomography%2C+X-

Ray+Computed%22%5BMesh%5D+OR+%22CT+Head%22%5Btw%5D+OR+CTH%5Btw%5D%29&size=200

PubMed Central: 4671 Hits

https://www.ncbi.nlm.nih.gov/pmc/?term=(%22altered+mental+status%22%5Btw%5D+OR+confusion%5Btw%5D+OR+disorientation+OR+unconscious*% 5Btw%5D+OR+AMS%5Btw%5D)+AND+(%22Tomography%2C+X-

Ray+Computed%22%5BMesh%5D+OR+%22CT+Head%22%5Btw%5D+OR+CTH%5Btw%5D)

CINAHL: 628 Hits

("altered mental status" OR confusion OR delirium OR disorientation OR unconscious OR AMS) AND ("Tomography, X-Ray Computed" OR "CT Head" OR CTH)

https://web-p-ebscohost-com.proxy.campbell.edu/ehost/results?vid=1&sid=315f5b5a-d468-4b0d-9b3c-

ca1abed29ccb%40redis&bquery=(%22altered+mental+status%22+OR+confusion+OR+delirium+OR+disorientation+OR+unconscious+OR+AMS)+AND+(%22Tomography%2c+X-

Ray+Computed%22+OR+%22CT+Head%22+OR+CTH)&bdata=JmRiPWNjbSZ0eXBIPTAmc2VhcmNoTW9kZT1TdGFuZGFyZCZzaXRIPWVob3N0LW xpdmU%3d

EMBASE: 1731 hits

('altered mental status'/exp OR 'altered mental status' OR 'confusion'/exp OR confusion OR 'delirium'/exp OR delirium OR 'disorientation'/exp OR disorientation OR 'unconscious'/exp OR unconscious OR ams) AND ('tomography, x-ray computed'/exp OR 'tomography, x-ray computed' OR 'ct head' OR cth)

https://www.embase.com/?phase=continueToApp#advancedSearch/resultspage/history.1/page.1/25.items/orderby.date/source.

	moderate and i	ingi quanty respec	cuvery									
Study	Were the groups comparable other than the presence of disease in cases or the absence of disease in controls?	Were cases and controls matched appropriately?	Were the same criteria used for identification of cases and controls?	Was exposure measured in a standard, valid and reliable way?	Was exposure measured in the same way for cases and controls?	Were confounding factors identified?	Were strategies to deal with confounding factors stated?	Were outcomes assessed in a standard, valid and reliable way for cases and controls?	Was the exposure period of interest long enough to be meaningful?	Was appropriate statistical analysis used?	Score	Quality
Callen A et al. (2020)	yes	n/a	yes	yes	yes	n/a	n/a	yes	yes	yes	7	moderate
Chen H et al. (2020)	yes	Yes	yes	yes	yes	yes	yes	yes	yes	yes	10	high
Detweiler M et al. (2020)	yes	Yes	yes	yes	yes	yes	no	yes	yes	yes	9	high
Detweiler M et al. (2017)	yes	Yes	yes	yes	yes	yes	no	yes	yes	yes	9	high
Finkelmei er F et al. (2019)	no	n/a	yes	yes	yes	unclear	yes	yes	yes	yes	7	moderate
Lai M et al. (2010)	yes	No	yes	yes	yes	yes	yes	yes	yes	yes	9	high
Patel M et al. (2012)	yes	Yes	yes	yes	yes	unclear	yes	yes	yes	yes	8	high
Rahimi R et al. (2016)	yes	Yes	yes	yes	yes	unclear	yes	yes	yes	yes	9	high
Segard J et al. (2013)	no	Yes	yes	yes	yes	unclear	yes	yes	yes	yes	8	high

eTable 2. The Joanna Briggs Institute's (JBI) critical appraisal checklist for case-control study. Total quality scores $\leq 4, 5$ to 7, and ≥ 8 were considered as low, moderate and high quality respectively

Study	Were the two groups similar and recruited from the same population?	Were the exposures measured similarly to assign people to both exposed and unexposed groups?	Was the exposure measured in a valid and reliable way?	Were confounding factors identified?	Were strategies to deal with confounding factors stated?	Were the groups /participants free of the outcome at the start of the study (or at the moment of exposure)?	Were the outcomes measured in a valid and reliable way?	Was the follow up time reported and sufficient to be long enough for outcomes to occur?	Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	Were strategies to address incomple te follow up utilized?	Was appropriate statistical analysis used?	Score	Quality
Bent C et al. (2015)	n/a	n/a	yes	yes	no	yes	yes	yes	yes	n/a	yes	7	moderate
Chokshi F et al. (2016)	n/a	n/a	yes	no	n/a	yes	yes	yes	yes	n/a	yes	6	moderate
Donovan L et al. (2015)	yes	n/a	yes	no	n/a	yes	yes	yes	yes	n/a	yes	7	moderate
Hanna A et al (2021)	n/a	n/a	yes	yes	yes	yes	yes	yes	yes	n/a	yes	7	moderate
Hufschmid t A et al. (2008)	yes	yes	yes	unclear	unclear	yes	yes	yes	yes	n/a	yes	8	high
Khan S et al. (2014)	yes	yes	yes	yes	yes	yes	yes	yes	yes	n/a	yes	10	high
Lim BL et al. (2009)	yes	yes	yes	unclear	unclear	yes	yes	yes	yes	n/a	yes	8	high
Nesselroth D et al. (2021)	n/a	n/a	yes	n/a	n/a	yes	yes	yes	yes	n/a	yes	6	moderate
Patel R et al. (2019)	n/a	n/a	yes	n/a	n/a	yes	yes	yes	yes	n/a	yes	6	moderate
Shuaib W et al (2014)	n/a	n/a	yes	n/a	n/a	yes	yes	yes	yes	n/a	yes	6	moderate

eTable 3. The Joanna Briggs Institute's (JBI) critical appraisal checklist for cohort study. Total quality scores $\leq 4, 5$ to 7, and ≥ 8 were considered as low, moderate and high quality respectively.

Sinclair D	n/a	n/a	ves	n/a	n/a	ves	ves	ves	ves	n/a	ves	6	moderate
et al. (1993)													
Thacker P	n/a	n/a	yes	n/a	n/a	yes	yes	yes	yes	n/a	yes	6	moderate
et al.						-	-		-				
(2021)													
Theisen-	n/a	n/a	yes	unclear	unclear	yes	yes	yes	yes	n/a	yes	6	moderate
Toupal J et													
al. (2014)													
Tu L et al	n/a	n/a	yes	n/a	n/a	yes	yes	yes	yes	n/a	yes	5	moderate
(2021)													
Wang X et	yes	yes	yes	unclear	yes	yes	yes	yes	yes	n/a	yes	9	high
al. (2013)		-	-										-
Wong J et	yes	yes	yes	no	n/a	yes	yes	yes	yes	n/a	yes	8	moderate
al. (2014)													

Study	Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	Were the participants included in any comparisons similar?	Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	Was there a control group?	Were there multiple measurements of the outcome both pre and post the intervention/exposure?	Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	Were the outcomes of participants included in any comparisons measured in the same way?	Were outcomes measured in a reliable way?	Was appropriate statistical analysis used?	Score	Quality
Covin o M eta l. (2019)	yes	yes	n/a	n/a	yes	Yes	yes	yes	yes	7	moderate

eTable 4. The Joanna Briggs Institute's (JBI) critical appraisal checklist for quasi-experimental study. Total quality scores $\leq 4, 5$ to 7 and ≥ 8 were regarded as low, moderate, and high quality, respectively.



eFigure 1. Funnel Plot Showing the Asymmetric Distribution of Studies Suggesting Significant Publication Bias for Computerized Tomography of Head (CTH) Events



eFigure 2. Funnel Plot Showing the Asymmetric Distribution of Studies Suggesting Significant Publication Bias for Positive Computerized Tomography of Head (CTH) Events

Omitted study		CTH Prevalence. with 95% CI	p-value
Bent C et al, citation 10, [2015]		0.85 [0.74, 0.95]	0.000
Callen A et al, citation 11, [2020]		0.85 [0.74, 0.95]	0.000
Chen H et al, citation 12, [2020]	•	0.87 [0.77, 0.97]	0.000
Chokshi F et al, citation 13, [2016]		0.85 [0.74, 0.95]	0.000
Covino M et al, citation 14, [2019]		0.85 [0.74, 0.95]	0.000
Detweiler M et al, citation 15, [2020]		0.85 [0.75, 0.96]	0.000
Donovan L et al, citation 17, [2015]		0.85 [0.74, 0.95]	0.000
Finkelmeier F et al, citation 18, [2019]		0.85 [0.74, 0.95]	0.000
Hanna A et al, citation 19, [2021]		0.85 [0.74, 0.95]	0.000
Hufschmidt A et al, citation 20, [2008]	•	0.86 [0.76, 0.97]	0.000
Khan S et al, citation 21, [2014]	•	0.85 [0.74, 0.95]	0.000
Lai M et al, citation 22, [2010]		0.85 [0.74, 0.95]	0.000
Lim B et al, citation 23, [2009]	•	0.87 [0.76, 0.97]	0.000
Nesselroth D et al, citation 24, [2021]		0.85 [0.74, 0.95]	0.000
Patel M et al, citation 25, [2002]	•	0.88 [0.78, 0.97]	0.000
Patel R et al, citation 26, [2019]		0.85 [0.74, 0.95]	0.000
Rahimi R et al, citation 27, [2016]	•	0.86 [0.76, 0.97]	0.000
Segard J et al, citation 28, [2013]		0.85 [0.74, 0.95]	0.000
Shuaib W et al, citation 29, [2014]		0.85 [0.74, 0.95]	0.000
Sinclair D et al, citation 30, [1993]		0.85 [0.74, 0.95]	0.000
Thacker P et al, citation 31, [2021]		0.85 [0.74, 0.95]	0.000
Theisen–Toupal J et al, citation 32, [2014]	•	0.85 [0.74, 0.95]	0.000
Tu L et al, citation 5, [2021]	•	0.88 [0.80, 0.97]	0.000
Wang X et al, citation 33, [2013]		0.85 [0.74, 0.95]	0.000
Wong J et al, citation 34, [2014]		0.85 [0.75, 0.95]	0.000
	7.8.9	1 .	

Random-effects REML model

eFigure 3. Sensitivity Analysis of Studies for Computerized Tomography of Head (CTH) Event

Omitted study		Positive CTH Prevalence. with 95% CI	p-value.
Bent C et al, citation 10, [2015]		0.13 [0.08, 0.19]	0.000
Callen A et al, citation 11, [2020]	•	0.14 [0.08, 0.20]	0.000
Chen H et al, citation 12, [2020]	e	0.14 [0.08, 0.19]	0.000
Chokshi F et al, citation 13, [2016]		0.13 [0.07, 0.19]	0.000
Donovan L et al, citation 17, [2015]		- 0.14 [0.08, 0.20]	0.000
Finkelmeier F et al, citation 18, [2019]		0.14 [0.08, 0.19]	0.000
Hanna A et al, citation 19, [2021]	•	- 0.14 [0.08, 0.20]	0.000
Hufschmidt A et al, citation 20, [2008]		0.13 [0.07, 0.19]	0.000
Khan S et al, citation 21, [2014]	•	0.14 [0.08, 0.20]	0.000
Lai M et al, citation 22, [2010]		0.13 [0.07, 0.19]	0.000
Lim B et al, citation 23, [2009]		0.11 [0.07, 0.16]	0.000
Nesselroth D et al, citation 24, [2021]		0.13 [0.07, 0.19]	0.000
Patel M et al, citation 25, [2002]	•	0.14 [.0.08, 0.19]	0.000
Patel R et al, citation 26, [2019]		0.13 [0.07, 0.19]	0.000
Rahimi R et al, citation 27, [2016]		0.13 [0.07, 0.19]	0.000
Segard J et al, citation 28, [2013]		0.12 [.0.07, 0.17]	0.000
Shuaib W et al, citation 29, [2014]		0.13 [0.07, 0.19]	0.000
Sinclair D et al, citation 30, [1993]		0.13 [.0.07, 0.19]	0.000
Thacker P et al, citation 31, [2021]	•	0.14 [.0.08, 0.19]	0.000
Theisen-Toupal J et al, citation 32, [2021]	•	- 0.14 [.0.08, 0.20]	0.000
Tu L et al, citation 5, [2021]	•	0.14 [0.08, 0.20]	0.000
Wong J et al, citation 34, [2014]		0.14 [0.08, 0.20]	0.000
.05	.1 .15	.2	

Random-effects REML model

eFigure 4. Sensitivity Analysis of Studies for Positive Computerized Tomography of Head (CTH) Events



eFigure 5. The Proportion of Computerized Tomography of Head (CTH) in Patients With Altered Mental Status (AMS) Among Studies ES= Effect size representing the proportion of CTH in AMS patients. The model used is the random effect model. USA= United States of America