

EVMS EM JC CRITICAL REVIEW FORM: THERAPY ARTICLES

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Date: 07/19/2022

Citation: Balderston JR et al., Covert Brain Infarction in Emergency Department Patients: Prevalence, Clinical Correlates, and Treatment Opportunities. Ann Emerg Med. 2022 Mar;79(3):265-269.

Background:

Head CTs are something we all order every day. As ER doctors we frequently find or have incidental findings reported. This study looked at one specific incidental finding that they called a "[covert](#) brain infarction". Covert brain infarctions are commonly as "focal lesions detected on brain imaging consistent with ischemia in the absence of a history of overt stroke or neurologic dysfunction" In this study the authors included "the presence of a large cortical infarct or lacunar infarct" reported as an incidental finding. Covert brain infarctions are consistent with ischemia and are associated with increased risk of future strokes. The AHA/ASA has published in [2018 recommendations](#) for primary stroke prevention in patients with covert brain infarctions. Covert brain infarction (CBI) is by far the most frequent incidental finding on brain imaging outweighing all other incidental findings on brain imaging combined with an estimated prevalence of ≈ 70 per 1000 brain MRIs overall and ≈ 300 per 1000 brain MRIs in patients aged ≥ 70 years. (Ref [1](#) & [2](#))

Study Objectives (1 & 2 Prespecified): To explore the following questions:

1. "to determine the prevalence of covert brain infarction in patients undergoing computed tomography (CT) in the ED who were subsequently discharged."
2. "to determine how often clinicians act on these findings or make patients aware of them".

Subsequent interventions for patients with covert brain infarction were noted (counseling or medication addition or adjustment).

Whether the neurology department was consulted during the ED visit was also noted, as was the indication for the consultation.

Study Methodology:

Retrospective medical record review study- they looked through charts of patients age >50 y/o who had presented over 9 months (January 1 to September 30 2018).

Included 832 patients who had non-contrast-enhanced head CTs

Excluded anyone who was admitted to inpatient or obs. Excluded those with known history of stroke, acute ischemia, or prior imaging with findings consistent with acute ischemia.

Medical records were reviewed to determine whether patients with covert brain infarction were informed of the findings, either as documented in their clinical note as being verbally made aware or in their discharge instructions

Radiology reports with clinical reads obtained at the time of the patient visit were consulted to determine the indication for the study and the presence of covert brain infarction

What were the results:

Initial patients: 1144, (excluded: 312) N=882. Average age: 62 years old, 50%Female.

- 11% (95) of patients who had head CTs in the identified population were found to have

covert brain infarctions

- 9% (9 patients) had documented evidence that they were made aware of findings.
- 9% (9 patients) had neurology consulted,
- 2 of the 9 patients had documented evidence of being made aware of findings.
- Aspirin was added for 3% (2 patients) who were not already on it
- No statins were administered.
- BP medications were given to 2% (2 patients)
- HTN was present in 73% of patient with covert infarctions

**no correlation between type of provider (Resident, attending, APP) and whether they were told about findings.

Applicability to my patient care: Oftentimes when I have diagnosed covert brain infarction it has been in patients who are presenting with some concerning neurologic complaint, weakness, numbness, dizziness, frequent falls etc. and caused admission for medical optimization but it is interesting to think about what you would do in an otherwise healthy patient. Should we start following recommendations like with the cardiac cta where we start patients on statins and aspirin? Making sure to counsel patients on risks for possible further ischemia and need for lifestyle modification? Should we be more aggressive about HTN counseling? Also needing to inform patients of incidental findings—we all struggle with this at times but this study I think highlights the importance of counselling and documenting conversations with patients about these findings. Many conversations may have been had but only a small % were documented.

Strengths:

Fairly large cohort N=832

I think this study asks a good question and examines interesting variables that were not subjective (stroke or not and charting of incidental or not?). Using binary (Y/N) objectives in retrospective chart reviews helps to decrease bias.

They had access to labs/vitals for patients that they are able to use to support their data.

The kappa (agreement) score between data abstractors of 40 random charts was 0.92 which is excellent (1.0 represents 100% agreement)

Good amount of background information/guidance provided by this study.

I liked that they were able to look at risk factors (HTN, HLD, DM, smoking) although their statistical analysis of these variables was not well elucidated.

I also think it was interesting that they were able to provide what the indication for a CT scan was.

Weaknesses:

Retrospective, single center may not be representative of our patient population HOWEVER being a VCU study likely similar to our patient population. .

Short time frame with no long term f/u. Had they looked at a cohort that presented years earlier they could have provided potentially important major event and mortality data

Reliant on physician documentation (how frequently do we verbalize findings to patients without documenting?) Probably underrepresents actual reporting to patients. You do it every time right?

Did not qualify radiologists or perform a kappa score with radiologists seperatly evaluating the same studies.

Study patient population was probably on average healthier and all were candidates for D/C

My Clinical Bottom Line: I think this study asks an important question and is a “teaching moment” that we have as ER doctors to provide early intervention in and possibly help avoid bad outcomes. I think it also helps to justify admitting patients who have covert brain infarctions for further medical workup/optimization in the setting of other risk factors. Would be interested to see this study taken to the next level. how many of these patients end up with infarcts/deficits over time?