Assessing Appropriateness of Magnetic Resonance Imaging for Headaches within the Lehigh Valley Health Network

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Assessing Appropriateness of Magnetic Resonance Imaging for Headaches within the Lehigh Valley Health Network

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Background

- Migraines cost the healthcare system and society at large more than $14 billion annually
- Medicare spends $146 to $211 million on imaging for headaches annually
- Office based neuroimaging costs at approximately $1 billion annually
- Only 1% to 3% of neuroimaging studies for chronic headaches reveal significant abnormalities
- Neuroimaging rates have increased despite multiple guidelines aimed at reducing overuse

Problem Statement

To what degree do MRIs - ordered for the evaluation of headaches in the outpatient setting at LVHN - meet the guideline recommendations as laid out by the American College of Radiology (ACR) in 2013 and the AAN.

Methods

A retrospective chart review was performed looking at MRIs ordered with the following associated diagnosis codes:

- headache (ICD10-R51)
- chronic headache (ICD10- G43.719)
- migraine without aura (ICD10-43.009)
- migraine with aura (ICD10-43.109)

Charts were manually reviewed and assigned an appropriateness score per the 2013 ACR Guidelines and per commonly cited red flag criteria.

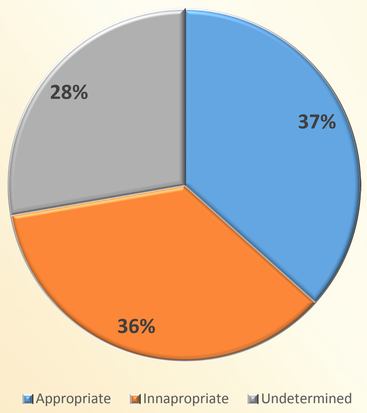
Key outcome measures included percentage of studies ordered appropriately as well as the percentage of studies with clinically significant findings.

Results

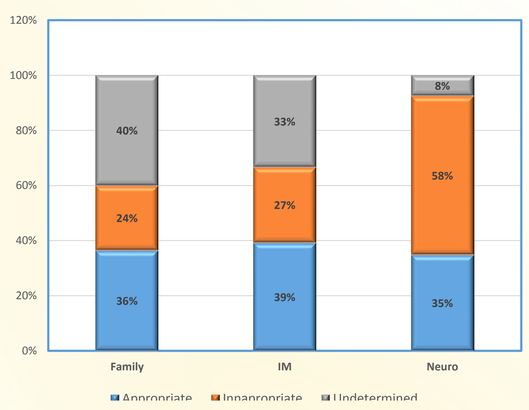
- 37% of studies were determined to be appropriate
- 36% were inappropriate
- 27% lacked sufficient data to make a determination
- On average 4% of the studies showed significant abnormalities on neuroimaging

	Family	IM	Neuro	All
Count	85	51	66	202
Insignificant	78	48	60	186
Significant	3	3	2	8
% Significant	4%	6%	3%	4%

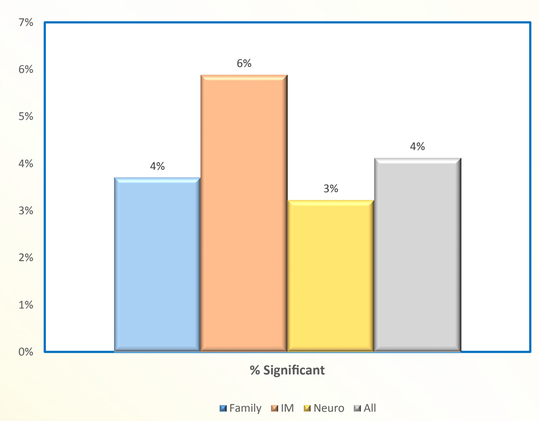
Appropriateness of Neuroimaging



ACR Score Unknown Relative Frequency



Significant Findings on Imaging



Discussion

- The percentage of clinically significant abnormalities found (4%) is in line with prior research on imaging for chronic headaches
- Results indicate significant room for improvement with only a third of studies being ordered appropriately. The remaining two-thirds were either innapropriate or lacked sufficient information in the note to make a determination
- Absence of a note, lack of chronicity, prior history, and medication use history were the most common information lacking
- All significant findings were associated with appropriate indications for neuroimaging findings. In one case, the wrong kind of imaging was ordered. This is reassuring as to the validity of the guidelines.

Conclusions

- We can do better in terms of the neuro-imaging we order at LVHN
- Areas with potential significant potential for improvement include
  - guideline adherence
  - documentation
- Future efforts for improvement may focus on educating providers on key red flag features, and which history/physical components are most important for determining whether imaging is warranted

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