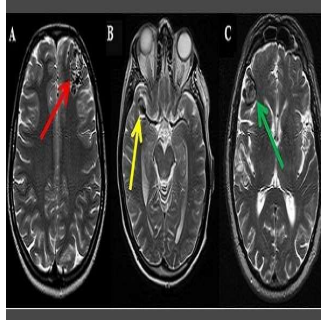


Managing Incidental Findings Found During Neuroimaging



Neuroimaging is an important diagnostic tool in the assessment of neurological disease, but often unmasks incidental findings (IFs). The negative impacts of IFs, such as patient anxiety, present neurologists with management dilemmas, largely due to the limited knowledge base surrounding the medical significance of these IFs. Specifically, the lack of evidence-based clinical trials investigating the efficacy of treatments for subclinical IFs makes management protocols challenging.

Thomas C. Booth, MD, Lysholm Department of Neuroradiology, National Hospital for Neurology and Neurosurgery in London, and Jennifer M. Boyd-Ellison, Department of Clinical Neurosciences, Western General Hospital in Edinburgh, conducted this study to determine the impact IFs may have on neurologists' workloads. Results show that neurologists managed the escalating workload caused by an increased number of referrals of patients with IFs found during neuroimaging, although it was unclear whether this was sustainable in the future.

Neurologists interviewed for this study "expected that an ageing population, along with the increased availability and technological advances of imaging, would bring renewed demands upon their future services," the authors note. "The views of study participants are concordant with other authors who show that one reason for an increased workload is that patients insist that they undergo imaging." The findings are published in the journal *PLoS ONE*.

Previous research has shown that evaluating an IF may subject the patient to needless testing, and in some cases needless treatments, which on occasion may be inconclusive or harmful.

Methodology

This qualitative research was conducted based on constructivist grounded theory. Data were collected through semi-structured interviews of purposively sampled neurologists, coded, and concurrent comparative analysis performed. A substantive theory of the "IF impacts" was developed after concept saturation.

The subject group (neurologists) are referred patients with IFs from general practitioners (GPs) and other hospital specialists. Participants gave permission to have their interviews recorded. The words and sentences in the transcribed text were repeatedly examined to provide provisional code related to the research question. A search for patterns in the provisional code allowed the data to be reduced into groups of different and similar focused codes.

Results and Discussion

Eight senior neurologists were enrolled in the study (six consultants and two specialist registrars), from a total of 12 approached in 2012. The analysis of interview transcripts elicited the core category title "incidental phenomenon" which included IFs in addition to other findings that do not have potential health or reproductive importance. Four theoretical categories emerged from the focused coding each relating to the core category:

- *Challenges for Patients and Clinicians Regarding Treatment and Management* : Participants said that, despite a large number of referrals to see patients with IFs, they were able to manage their overall workload. They stated that patient anxiety needed to be addressed before discussions could begin regarding treatment choices. There was disagreement between neurologists regarding the definition, significance and optimal management of IFs, reflecting the published literature.
- *The Increased Role of the Radiology Department* : Participants claimed technological advances in imaging techniques and image resolution improvements were uncovering more unexpected anomalies and that characterising such anomalies was increasingly difficult.
- *Innovations to the Participants' Practice* : Participants altered their working practice to accommodate the IFs. Participants informed patients who had no neurological clinical features and who insisted that they undergo neuroimaging, about IFs and their associated risks. Multidisciplinary neuroradiology meetings and interventional neuroradiology clinics, where IFs were discussed, were found to be vital in the management of the patients.
- *Financial Challenges* : Participants requested MRI in the first instance over the cheaper option of computed tomography (CT). This was mainly due to 'patient' preference, including refusal to undergo CT scanning, but neurologists also claimed futility of CT scanning as 'patients' invariably insisted on a MRI scan after a normal CT report.

Conclusions

The impact of IFs upon the neurologist, patient and the health institution appeared considerable. Further research determining the natural history of subclinical IFs and the efficacy of intervention will help to alleviate these issues. Research looking into patients' attitudes towards IFs and how to reduce unnecessary anxiety would also be valuable.

Image Credit: Thomas C. Booth/Jennifer M. Boyd-Ellison

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