Imaging Psychosis: quantifying abnormalities found on MRI head scans in first episode psychosis.

Anam Waqar[1,2], Luke Baxter[1,2], Matthew Butler[2], Ahmed Abdelsamie[1,2], Sneha Barai[1,2], Ishaac Awatli[1,2], Theo Boardman-Pretty[1,2], Rebecca Phelps[1,2], Amelia Jewell[1], Thomas Reilly[1,3]

1. South London and Maudsley NHS Foundation Trust, 2. King's College London, 3. University of Oxford

Introduction

Although in most cases secondary causes of psychosis are not identified, there are instances in which neuroimaging finds rare causes of psychosis.

Current NICE guidelines advise against neuroimaging in cases of first episode psychosis (FEP) [1].

Nevertheless, there has been dubiety about this recommendation given the uncertainty around the prevalence of radiological abnormalities [2].

We sought to contribute real-world clinical data to the issue by reviewing records of all patients first diagnosed with a psychotic illness in South London and Maudsley NHS trust between 2007 - 2021, and quantifying the types of abnormalities found on magnetic resonance imaging (MRI).

Aim

- This study aimed to:
  - Determine whether there were abnormal findings on the MRI results of a large cohort of patients presenting with first episode psychosis.
  - Determine and classify the type and prevalence of radiological abnormalities, if any were found.

Method

Records for patients diagnosed for the first time with a psychotic disorder who had an MRI within 18 months of diagnosis were extracted using the Clinical Record Interactive Search, an anonymised data system based on electronic clinical records.

We extracted neuroimaging reports from associated documents and from the free text of the health records.

We grouped radiological abnormalities as follows:

- **Atrophy**
- **Cysts**
- **Pituitary abnormalities**
- **Tumours**
- **Vascular** (including lacunae, post ischaemic lesions, vascular malformations)
- **Ventricular** (including cavum septum pellucidum et verga),
- **White matter abnormalities** (including small vessel ischaemic change, white matter hyperintensities, periventricular hyperintensities, demyelinating disease),
- **Other** (including traumatic changes, calcification of the anterior cerebral falx).

Data extraction was undertaken in duplicate with disagreement resolved by a senior researcher.

Descriptive statistics were obtained.

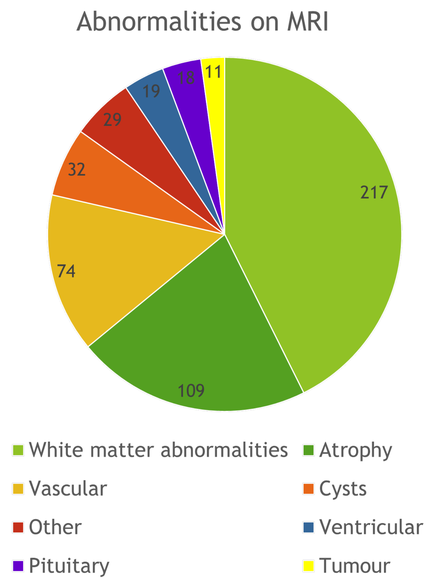
Results

Out of **1,749** records screened (53.9% male, mean age 37), results were available for **1537** patients.

In total, **397** (25.9%) scans were abnormal.

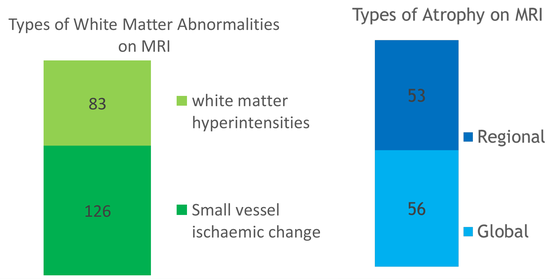
Prevalence of different categories of abnormalities were:

- 217 (14.1%) **White matter abnormalities**
- 109 (7.1%) **Atrophy**
- 74 (4.8%) **Vascular**
- 32 (2.1%) **Cysts**
- 29 (1.9%) **Other**
- 19 (1.2%) **Ventricular**
- 18 (1.2%) **Pituitary**
- 11 (0.7%) **Tumour**



The largest group of abnormalities were **white matter abnormalities** within which, 126 (8.2%) were **small vessel ischaemic change**, the most frequently reported, 83 (5.5%) were **white matter hyperintensities** (which include T2 hyperintensities)**.**

Of the scans reporting **atrophy**, 56 (51.4%) were **global** and 53 (48.6%) were **regional**.



Conclusion

This study found a quarter of patients presenting with an FEP had abnormal findings on MRI. The most common findings were white matter abnormalities, within which small vessel ischaemic changes represented over half of results, while tumours were uncommon (<1% sample).

Reversible causes of first episode psychosis discovered by MRI scanning are indeed rare and a considered approach to scanning should be adopted by clinicians.

Contact: Anam Waqar
Email: anam.Waqar@slam.nhs.uk

References

1. https://www.nice.org.uk/guidance/ta136/chapter/4-Evidence-and-interpretation
2. Blackman G et al. Prevalence of Neuroradiological Abnormalities in First-Episode Psychosis: A Systematic Review and Meta-analysis. JAMA Psychiatry. 2023 Oct 1;80(10):1047-1054