Use of brain imaging (computed tomography and magnetic resonance imaging) in first-episode psychosis: review and retrospective study

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CRD summary
This review concluded that computed tomography and magnetic resonance imaging of the brain offered little benefit in the assessment of patients with first-episode psychosis. This conclusion reflected the data presented, but should be viewed cautiously, given the small number of included patients, the rarity of the target condition(s) and the methodological limitations of the review.

Authors’ objectives
To assess the diagnostic yield of brain computed tomography (CT) and magnetic resonance imaging (MRI) in first-episode psychosis.

Searching
MEDLINE and EMBASE were searched from inception to October 2007; search terms were reported. Bibliographies of relevant articles were screened for additional studies.

Study selection
Prospective or retrospective studies, in which at least one patient group was clearly identified as first-episode psychosis, and where the mean age was 35 years or younger, were eligible for inclusion. Included studies were required to report individual MRI or CT brain findings in detail. Studies of brain morphological changes in psychosis were excluded.

All the included studies of CT were conducted in inpatients (age range 17 to 66 years); reported psychiatric diagnoses included schizophreniform disorder, atypical psychosis, brief psychosis, schizoaffective disorder, organic brain disorder, borderline personality disorder, manic phase of bipolar affective disorder, major depression with psychotic features, substance abuse, and delusional disorder.

The included studies of MRI did not report psychiatric diagnoses; mean participant ages ranged from 21.6 and 30.3 years. One study was conducted in outpatients; the setting of the other study was not reported.

The authors did not state how many reviewers assessed studies for inclusion.

Assessment of study quality
The authors did not state that they assessed methodological quality.

Data extraction
Radiological findings reported by included studies were assessed individually, and then by consensus panel including a neurologist, a psychiatrist, and two psychiatric residents.

Findings were classified as: normal; abnormal, with no clinical impact (benign or non-specific findings with no implication for diagnosis, management, or treatment); abnormal, with implications for management or treatment, but unlikely to have a causal link to psychotic symptoms; abnormal, with implications for management or treatment, and a possible causal link to psychotic symptoms.

Methods of synthesis
Results were summarised in a narrative synthesis and tables.

Results of the review
The review included five studies (n=522 patients); three studies were of CT imaging (n=340 patients) and two were of
MRI (n=182 patients).

The estimates for overall diagnostic yield (abnormal, with implications for management or treatment, and a possible causal link to psychotic symptoms) were 1.3% for CT and 1.1% for MRI scans. MRI scans resulted in a number of incidental, clinically irrelevant findings.

The authors also reported results for their own retrospective study of 46 patients (44 CT and 2 MRI), which yielded no CT or MRI findings with implications for diagnosis or management.

**Cost information**
The authors estimated a cost per positive finding of US dollars ($) 18,711 for CT and $39,560 for MRI.

**Authors' conclusions**
In first-episode psychosis, routine CT or MRI scans were of little benefit and should be reserved for situations where history or examination suggests neurological causation, or possibly for people aged 50 years and older.

**CRD commentary**
The review addressed a clearly stated research question and defined appropriately broad inclusion criteria. The search for relevant studies was limited to two databases and reference screening. It was unclear whether any language or publication status restrictions were applied. Reporting of the review process was limited.

No assessment of the methodological quality of included studies was provided; the quality of the underlying data and robustness of the review process could not be adequately assessed. The use of a narrative synthesis was appropriate. Details of individual study findings were reported.

The authors conclusion, that CT and MRI showed little benefit, was in line with the data presented, but should be viewed cautiously, given the small number of participants included, the rarity of the target condition(s) and the methodological limitations of the review. Data were not adequate to suggest subpopulations in whom neuro-imaging may be useful.

**Implications of the review for practice and research**
**Practice:** The authors stated that neuro-imaging cannot currently replace conventional history-taking, mental status, and neurological examination for the assessment of first-episode psychosis.

**Research:** The authors recommended a prospective before-and-after study, with a baseline clinical assessment followed by imaging and reassessment. They stated that such a study should attempt to classify findings into the four groups defined in the current article, and should go beyond imaging findings to detail ensuing diagnostic or therapeutic actions, along with impact on overall patient health.

**Funding**
None.

**Bibliographic details**

**PubMedID**
19660172

**Original Paper URL**
http://publications.cpa-apc.org/media.php?mid=818
Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Adult; Aged; Brain /pathology; Brain Damage, Chronic /diagnosis /pathology /psychology; Diagnosis, Differential; Female; Humans; Magnetic Resonance Imaging; Male; Middle Aged; Psychotic Disorders /diagnosis /pathology /psychology; Referral and Consultation; Retrospective Studies; Statistics as Topic; Tomography, X-Ray Computed

AccessionNumber
12010005130

Date bibliographic record published
15/09/2010

Date abstract record published
09/03/2011

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.