The high incidence and bioethics of findings on MR brain imaging of normal volunteers for neuroscience research

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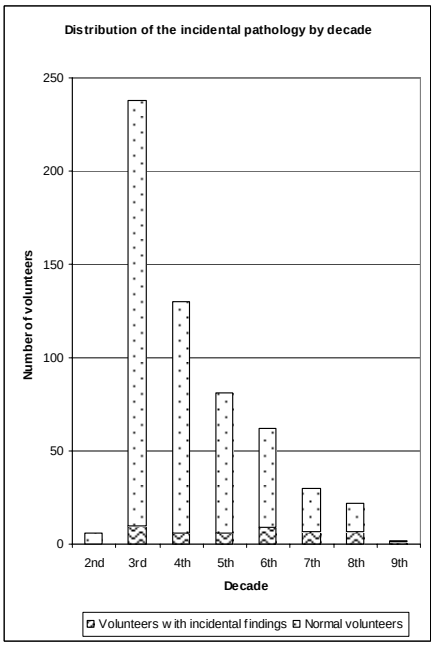
Background:
The bioethics surrounding the incidental findings are not straightforward and every imaging institution will encounter this situation in their normal volunteers. Yet the implications for the individuals involved may be profound. Should all participants have review of their imaging by an expert? If abnormalities are found, who should be informed?
Methods:
The normal volunteers that were imaged on a 3T Intera MR system (Philips Medical Systems, Best, Holland) and on a 1.5T Edge Eclipse (Philips Medical Systems, Best, Holland) were reviewed by a consultant neuroradiologist and findings reviewed by another. All participants completed a volunteer consent form in addition to a standard departmental MR safety screening form. The volunteer screening form requires the general practitioner details to be completed and asks the participant to consider closely the possibility and implications of finding an unexpected but potentially serious abnormality before signing.
Results:
In total there were 525 different individuals scanned as normal volunteers, of whom 46 had definite significant abnormalities, that is, 8.8%. A further 4 individuals had scans suggestive of significant pathology. Significant pathology we have defined in terms of diagnoses requiring referral classified in the Illes et al publication in 2004 as categories 2 to 4. The mean age amongst the volunteers with abnormalities was 50 years and there were 17 males and 29 females. The mean age amongst the volunteers as a whole was 35 years and 330 were males out of the 525. The mean age of the 151 participants imaged at 3T was 36 years (range 20-67 years; median 34 years) and 35 years (range 20- 81 years; median 30 years) at 1.5T. No difference in the incidence of pathology was demonstrated between the different field strength scanners (31/374 at 1.5T, 15/151 at 3.0T). It was noteworthy that our incidental pathology didn't include any cerebral aneurysms as might have been expected in a sample of this size, although the average age of these participants was relatively low.



Conclusion:
We have found a high rate of incidental abnormalities amongst individuals participating in imaging studies at our institution, higher than in series from North America. It is our current practice to inform the research study participant of the findings, council them and inform their primary care physician. We think that it is advisable for researchers utilising MR imaging of the brain to have access to trained neuroradiologists, a protocol in place to deal with this problem and take consent in a way that allows the participant to realise the possibility of an abnormal finding and its possible ramifications.

References

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