Neuroimaging distinction between neurological and psychiatric disorders – was there really one?

I read with great interest the article by Crossley et al1 and, although commending their work, I was surprised to arrive at the opposite conclusion to that of the authors. In their meta-analysis of structural magnetic resonance imaging correlates of ‘psychiatric’ and ‘neurological’ conditions they find that both classifications appear to correlate with some distinct regional brain volume changes. In their discussion of these findings they conclude that their analysis lends weight to the argument that the disorders may be thought of as belonging to two distinct classes. I was surprised at this conclusion and would ask the reader to consider that these results may actually suggest the opposite for the following three reasons.

First, given the established functional organisation of brain anatomy one might, a priori, predict that different clinical symptoms (hallucinations v. motor apraxia for example) are associated with dysfunctional activity in spatially distinct brain regions. With this in mind, the finding that the psychiatric and neurological classes affected different brain structures is perhaps not surprising. Personally, I found the considerable overlap between the classes the most interesting finding. This finding suggests that disease-specific ‘lesions’ have a considerable effect on wider neural network structure. Understanding of the mechanisms of these shared findings requires input from both specialties.

Following on from this it is important to remember that the grey matter volume reduction was reliably found in both classes of disorder albeit in some different brain regions. A finding more parsimonious with the authors’ conclusion would have been if there was no evidence of volume loss in one set of disorders v. the other. This would clearly have segregated the conditions. Instead, we must now accept that the presence of structural brain changes clearly establishes both as disorders of the central nervous system.

Finally, from a clinical perspective, the symptoms patients experience do not sit neatly on either side of the classic psychiatric and neurological divide and the findings from this paper may go some way as to explaining why. To segregate these classes based on a few regional differences in grey matter volume may appear somewhat artificial especially in face of the clinical burden of psychiatric symptoms in neurological patients and vice versa. Furthermore, I do not believe that either group of patients are best served by the call to keep the intellectual framework of these two groups of disorders separate.

Importantly, accepting that there are neurobiological similarities between traditionally neurological and psychiatric conditions does not equate to saying that either clinical specialty should feel threatened by the other. The considerable differences in clinical approach, decision-making and support structures employed by neurologists and psychiatrists are sufficiently distinct that we should not feel threatened to admit that the disorders we are seeing manifest from dysfunction of the same organ. Accepting this stance will, hopefully, facilitate the cross-fertilisation of knowledge and lead to improved care for both sets of patients.


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