
Every metal has its day and now it appears to be the turn of iron. Considering the dramatic effects shown by iron overload in haemochromatosis or indeed by iron deficiency on peripheral organs, it is perhaps surprising that iron in brain has received relatively little attention. The occurrence of iron deposits in brain in Hallervorden-Spatz syndrome should have signalled the important role it might play. More recently there have been conflicting suggestions that iron levels are increased in substantia nigra in Parkinson's disease and that iron preparations may be beneficial in the treatment of the illness.

So, the publication of a volume on the role of iron in brain is a well timed event.

The book opens with a discourse by Dr Hill on the distribution of iron in brain. This emphasises the uneven levels of iron found in different brain regions, and its dependence on the age of animals or man and the sex difference in iron accumulation. The author also seems drawn to a relationship between iron distribution in brain and that of GABA. Most interestingly the author dwells on the techniques available for locating iron in brain at the cellular and subcellular level and the problems of visualising soluble forms of such as ferritin. However, the text dwells on the authors own techniques and it would have been apt to draw comparisons with the other methods available. Coverage is given to the cellular location of ferritin, transferritin and ferritin receptors but there is little mention of other iron binding molecules. With the evidence for iron deposition in a variety of neurodegenerative diseases some coverage of haemosiderin would have been welcome.

Iron dependent enzymes play a major role in neurotransmitter synthesis and energy metabolism. So appropriately Drs Wrigglesworth and Baum have contributed a detailed summary of this area. The coverage given to different enzymes was uneven perhaps reflecting the available data but in some instances no role for iron in the functioning of a metalloenzyme was suggested. However, the chapter emphasises how alterations in iron metabolism might severely disrupt brain function.

The following contribution came as a surprise in a volume dedicated to iron in brain. Dr Sourkes reviews the role of trace metals in neurochemistry. Excellent coverage is given to the function of cobalt, copper, zinc and manganese but not iron. Indeed, Dr Sourkes makes it clear from the start that "the neurochemistry of iron is the subject of the rest of this volume and needs no elaboration here". No criticism of Dr Sourkes' contribution should be taken but perhaps the editor should be made the scapegoat for this interruption in the discourse on iron.

Next comes the editor himself, Professor Moussa Youdim, with his colleague Dr Yehuda, dealing with brain iron deficiency. They produce evidence which clearly demonstrates the role of iron in dopamine mediated motor behaviour, dopamine receptors and in cognitive function. They postulate an important role for iron in the production of tardive dyskinesia by neuroleptic drugs involving effects on both brain dopamine and GABA systems. Only further study will determine whether this idea is correct or not.

Lastly, Drs Pollit and Kim raise the important issue of whether iron deficiency in children affects learning and achievement. From a comprehensive examination of various studies they conclude that iron deficiency anaemia interferes with brain function among pre-school and school-age children. If confirmed this conclusion has important implications for health education.

The volume provides an interesting insight into the role iron might play in brain function. My overall impression was that there is a long way to go to convince everybody that iron is involved in specific disease areas. I also felt that a larger volume giving more coverage to some of the basic science issues of iron handling by brain would have been appropriate and would have given less emphasis to the more speculative areas of iron's role in specific disease areas. However, I enjoyed reading the volume which at least partially fills a gap which has existed in the literature for too long.

---

G BROCKLEHURST