Serum ferritin is increased in a subset of patients with frontotemporal dementia

Martha S. Foiani[1], MRes; Carolin Heller[1], BSc; Ione O. Woollacott[2], Amanda J. Heselgrave[1], PhD; Jason D. Warren[2], Henrik Zetterberg[1,3], MD, PhD; Jonathan D. Rohrer[2], MD, PhD

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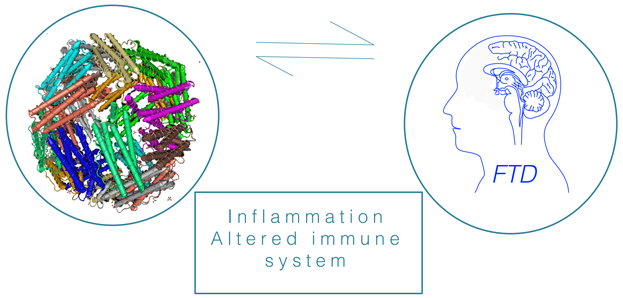
Background

Frontotemporal dementia (FTD) is a common cause of early-onset dementia. Recent studies have shown a role for inflammation and an altered immune response in FTD. Serum levels of ferritin, an iron carrier and storage protein, are increased in inflammatory disorders and can therefore be a surrogate marker of inflammation. In this study we aimed to evaluate whether serum ferritin levels are increased in patients with FTD.



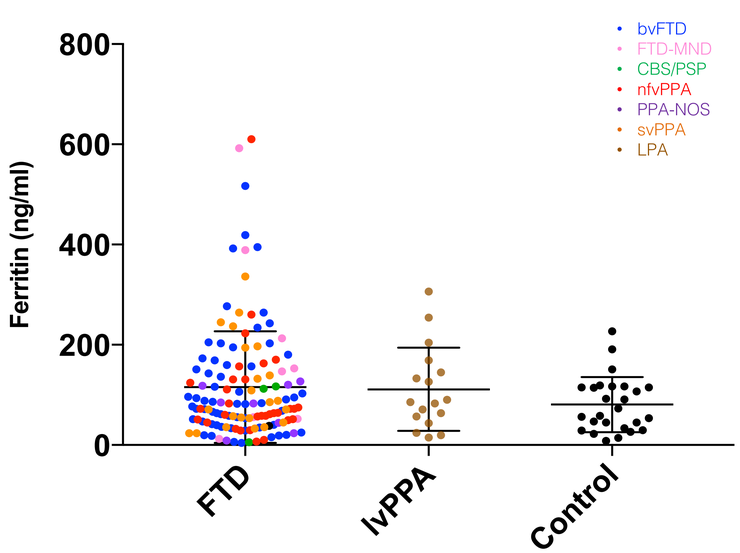
Methods

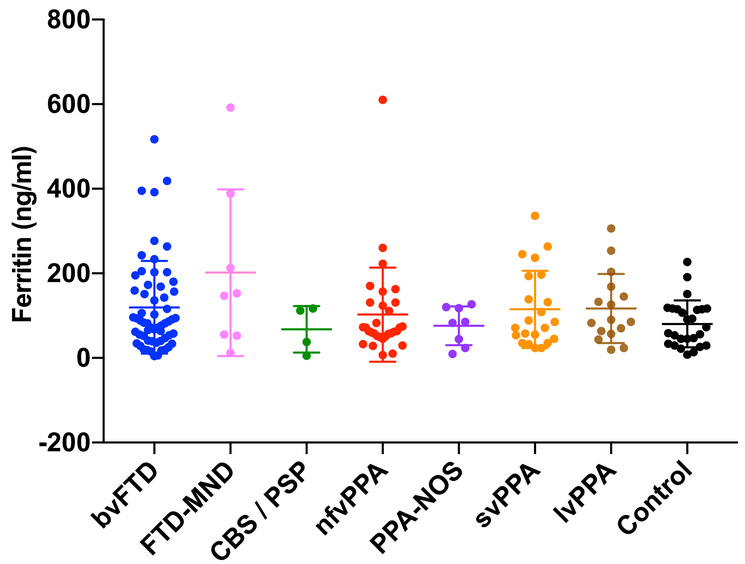
Using a latex fixation test we measured ferritin levels in serum samples of 132 patients meeting diagnostic criteria for an FTD spectrum disorder (59behavioural variant FTD, 8 FTD with motor neurone disease (MND), 4 with corticobasal syndrome/progressive supranuclear palsy, 31 nonfluent variant PPA, 8 PPA-not otherwise specified, 22 semantic variant primary progressive aphasia (PPA) as well as 16 patients with logopenic variant PPA and 26 healthy controls. Of these, 35 had a genetic form of FTD (16 with C9orf72 expansions, 8 with GRN and 11 with MAPT mutations).

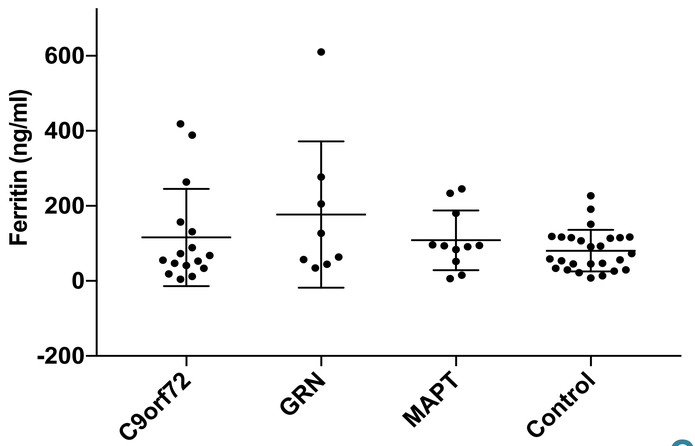
	Groups		n	Gender (male;%)	Age	Disease Duration
Clinical	FTD	bvFTD	59	77	67.4	9.5
		FTD-MND	8	75	68.4	9.6
		CBD/PSP	4	25	71	11.5
		nfvPPA	31	42	73.1	7.9
		PPA-NOS	8	75	68.9	9.9
		svPPA	22	54	68.1	8.7
	lvFTD		17	71	70.1	8.3
	Healthy Controls		26	42.8	69.6	-
Genetic	C9orf72		16	68.8	68.6	11
	GRN		8	62.5	66.3	7
	MAPT		11	81.8	62.5	11

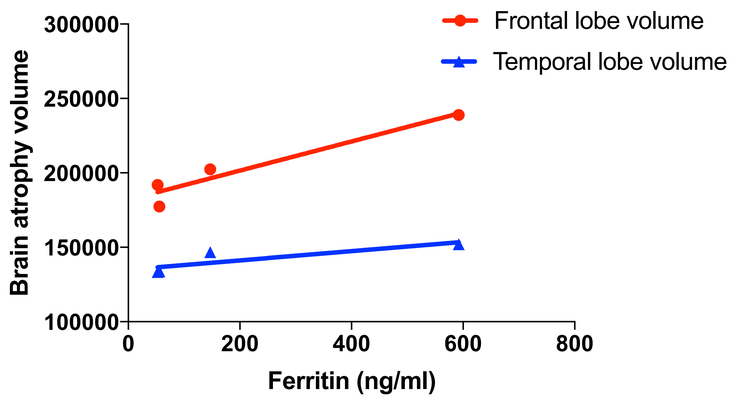
Results

Mean (standard deviation) ferritin levels (ng/ml) in the FTD group were 115.8 (111.4), 111.2 (85.5) in the logopenic variant PPA group and 80.7 (55.1) in the controls. Although there was no significant difference between the disease groups there was a subset of patients with FTD with very high ferritin levels. Stratifying the FTD cohort according to clinical diagnosis, patients with FTD-MND (201.8 (197.2)) had the highest levels. 35 patients had tested positive for genetic mutations: the GRN mutation group had the highest ferritin levels (177.3 (194.9), followed by individuals with C9orf72 expansions (115.9 (129.8)). Combining genetic and pathological cases, levels were higher in those with definite or likely TDP-43 pathology (152.7 (164.3)) compared to individuals with tau pathology (108 (79.5)). Ferritin concentration did not correlate with disease duration in any of the groups.









Conclusion

This study shows a trend for increased serum ferritin levels in FTD, particularly in those with TDP-43opathies, which include clinically FTD-MND and genetically GRN and C9orf72 mutations. This study adds further evidence for the role of inflammation in FTD.

This work was supported by the Leonard Wolfson Biomarker Laboratory and the NIHR Queen Square Dementia Biomedical Research Unit, the NIHR UCL/H Biomedical Research Centre. The Dementia Research Centre is supported by Alzheimer's Research UK, Brain Research Trust, and The Wolfson Foundation.

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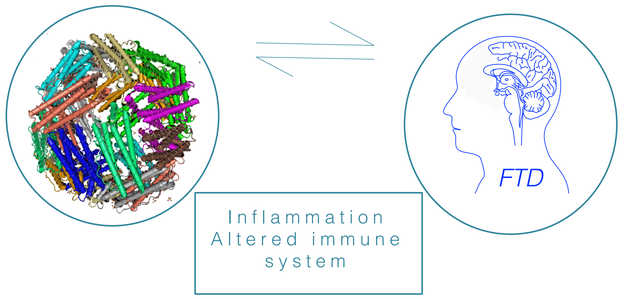

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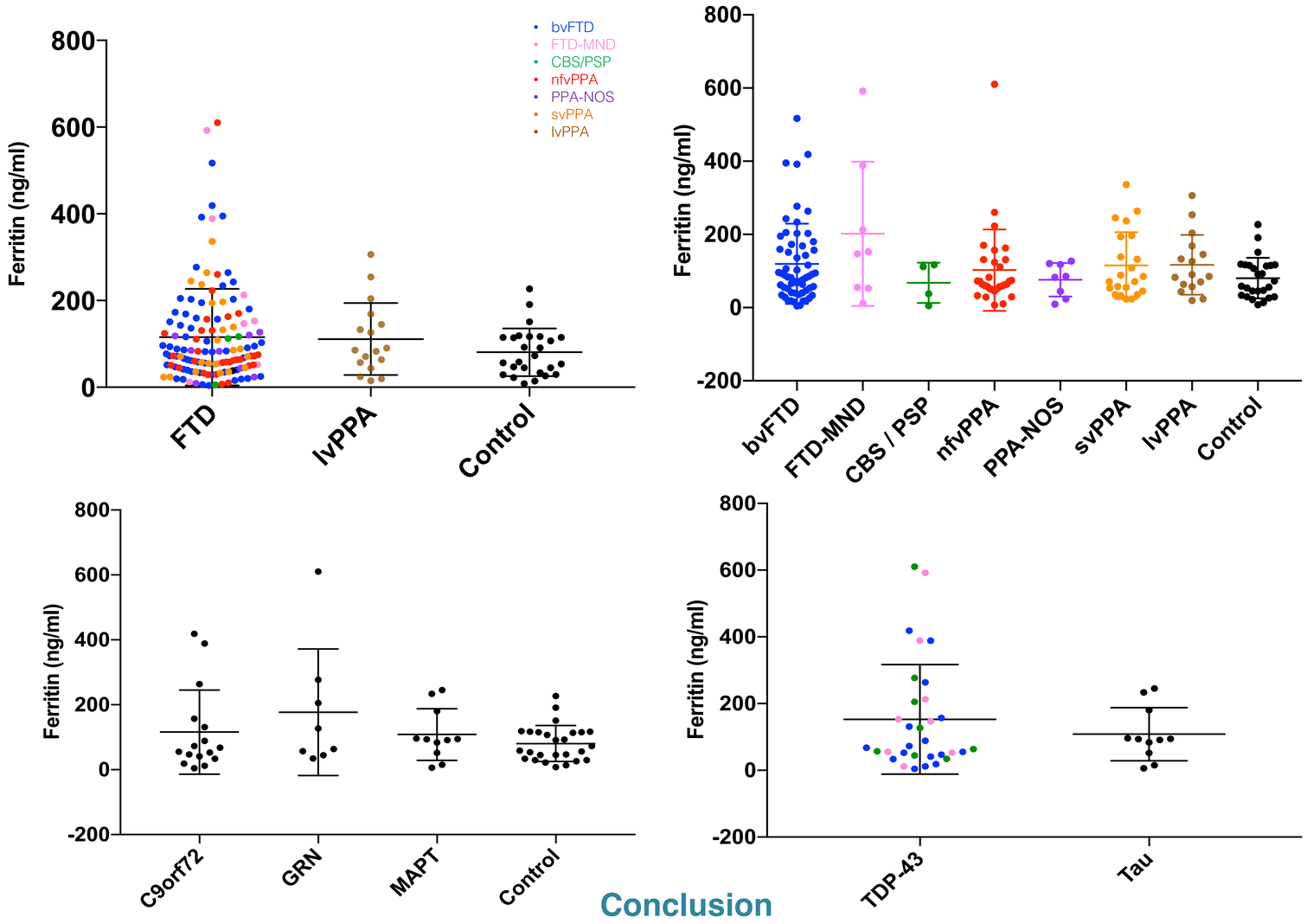

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