

Evidence of widespread metabolite abnormalities in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome: Assessment with whole-brain Magnetic Resonance Spectroscopy.

Brain Imaging and Behavior

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R Precentral Gyrus	ME/CFS	15	6.000	0.741	-1.880	28	0.071																																																																																																																																																																																																																																
	Controls	15	6.656	1.131				L Precentral Gyrus	ME/CFS	15	6.355	1.130	-0.548	28	0.588	Controls	15	6.555	0.854	R Frontal Lobe	ME/CFS	15	5.747	0.612	-1.858	28	0.074	Controls	15	6.369	1.142	L Frontal Lobe	ME/CFS	15	6.035	0.717	-1.469	28	0.153	Controls	15	6.440	0.793	R Rolandic Operculum	ME/CFS	15	6.235	0.808	-1.247	28	0.223	Controls	15	6.592	0.760	L Rolandic Operculum	ME/CFS	15	6.815	1.161	1.054	28	0.301	Controls	15	6.465	0.551	R Supplemental Motor Area	ME/CFS	15	5.634	0.843	-0.430	28	0.671	Controls	15	5.772	0.914	L Supplemental Motor Area	ME/CFS	15	5.777	0.959	-0.225	28	0.824	Controls	15	5.850	0.807	R Insula	ME/CFS	15	5.938	0.576	-1.633	28	0.114	Controls	15	6.338	0.755	L Insula	ME/CFS	15	6.675	0.797	1.723	28	0.096	Controls	15	6.273	0.426	R Anterior Cingulum	ME/CFS	15	6.852	1.495	1.487	28	0.148	Controls	15	6.079	1.350	L Anterior Cingulum	ME/CFS	15	6.740	1.174	0.797	28	0.432	Controls	15	6.405	1.125	R Mid Cingulum	ME/CFS	15	6.243	0.667	-0.422	28	0.676	Controls	15	6.348	0.695	L Mid Cingulum	ME/CFS	15	6.140	0.691	-0.667	28	0.510	Controls	15	6.300	0.620	R Posterior Cingulum	ME/CFS	15	5.505	0.572	0.136	28	0.893	Controls	15	5.476	0.608	L Posterior Cingulum	ME/CFS	15	5.006	0.688	0.313	28	0.757	Controls	15	4.932	0.604	R Hippocampus	ME/CFS	15	4.500	0.656	0.253	28	0.802	Controls	15	4.436	0.734	L Hippocampus	ME/CFS	15	5.054	0.869	0.286	28	0.777	Controls	15	4.976	0.586	R Calcarine	ME/CFS	15	7.842	1.305	1.201	28	0.240	Controls	15	7.340	0.957	L Calcarine	ME/CFS	15	7.472	1.305	0.527	28	0.602
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R Cuneus	ME/CFS	15	8.007	1.654	0.804	28	0.428
	Controls	15	7.593	1.113			
L Cuneus	ME/CFS	15	7.925	1.775	0.265	22.417†	0.794
	Controls	15	7.784	1.026			
R Lingual Gyrus	ME/CFS	15	7.094	1.207	1.438	28	0.161
	Controls	15	6.527	0.936			
L Lingual Gyrus	ME/CFS	15	6.622	1.046	0.168	28	0.868
	Controls	15	6.563	0.873			
R Occipital Lobe	ME/CFS	15	8.800	1.410	1.059	28	0.299
	Controls	15	8.319	1.048			
L Occipital Lobe	ME/CFS	15	7.614	1.483	-0.489	28	0.629
	Controls	15	7.841	1.015			
R Fusiform Gyrus	ME/CFS	15	7.317	1.270	1.648	28	0.111
	Controls	15	6.637	0.970			
L Fusiform Gyrus	ME/CFS	15	6.436	0.830	-0.594	28	0.557
	Controls	15	6.614	0.807			
R Postcentral Gyrus	ME/CFS	15	6.751	0.713	-1.406	28	0.171
	Controls	15	7.165	0.890			
L Postcentral Gyrus	ME/CFS	15	6.150	1.157	-1.596	28	0.122
	Controls	15	6.768	0.951			
R Parietal Lobe	ME/CFS	15	8.234	1.148	0.033	28	0.974
	Controls	15	8.221	0.985			
L Parietal Lobe	ME/CFS	15	6.417	1.056	-2.323	28	0.028*
	Controls	15	7.252	0.907			
R Precuneus	ME/CFS	15	6.816	1.013	-0.399	28	0.693
	Controls	15	6.963	1.014			
L Precuneus	ME/CFS	15	6.405	1.022	-0.838	28	0.409
	Controls	15	6.694	0.859			
R Paracentral Lobule	ME/CFS	15	5.683	1.073	-0.944	28	0.353
	Controls	15	6.074	1.186			
L Paracentral Lobule	ME/CFS	15	5.567	1.093	-1.589	28	0.123
	Controls	15	6.211	1.126			
R Caudate	ME/CFS	15	4.770	1.093	-0.715	22.427†	0.482
	Controls	15	5.003	0.632			
L Caudate	ME/CFS	15	5.136	1.157	1.894	17.628†	0.075
	Controls	15	4.534	0.420			
R Putamen	ME/CFS	15	5.399	1.008	-1.518	28	0.140
	Controls	15	5.921	0.870			
L Putamen	ME/CFS	15	6.324	0.717	2.738	28	0.011*
	Controls	15	5.694	0.529			
R Pallidum	ME/CFS	14	4.827	1.268	-0.072	27	0.943

	Controls	15	4.857	0.938			
L Pallidum	ME/CFS	14	5.207	1.134	0.725	27	0.475
	Controls	15	4.937	0.861			
R Thalamus	ME/CFS	15	4.228	0.727	-0.100	28	0.921
	Controls	15	4.254	0.725			
L Thalamus	ME/CFS	15	4.717	0.932	0.867	28	0.394
	Controls	15	4.453	0.725			
R Temporal Lobe	ME/CFS	15	7.374	0.949	0.400	28	0.692
	Controls	15	7.261	0.559			
L Temporal Lobe	ME/CFS	15	6.616	0.622	-1.299	28	0.204
	Controls	15	6.879	0.477			
Cerebellum	ME/CFS	15	7.168	1.450	0.321	28	0.750
	Controls	15	7.023	0.978			

ROI = region of interest; L = left; R = right

†df adjusted for unequal variances between groups.

*denotes significant group differences at $p < 0.05$

Mean creatine (CR) area under curve (AUC) in the ME/CFS and control groups, and their standard deviations (SD). t -values and corresponding p -values are from independent-samples t -tests comparing the group means in each region.