

Table 1.

Paper	Patients	Diagnosis	Electrode position	Age years	Number of ECT treatments	Gender	Clinical improvement / depression severity after ECT index series	Cognitive side effects	MRI parameters	Pre-processing pipeline
Biedermann <i>et al.</i> , 2015 (19)	22	MDD (DSM-IV)	Not reported	49.1 ± 16.56	Not reported	m 5 (23%), f 17 (77%)	HAMD-17 (pre-ECT: 28.0 +/- 7.0, post-ECT 9.2 +/- 5.1) BDI (34.1 +/- 13.6 vs. 16.2 +/- 12.5) <i>Mild depression</i>	MMSE (pre-ECT: 26.7 +/- 3.9, post-ECT 28.1 +/- 3.0)	Siemens Magnetom Vision Plus 1.5 T TR = 1.35s, TE1/2 = 40/32 ms, 1000 Hz bandwidth, spatial resolution 1.05 mm ³ , 154 slices	SPM8, VBM8 toolbox, smoothing with 8 mm ³ full width half maximum Gaussian Kernel
Boukaert <i>et al.</i> , 2016 (20)	28	MDD (DSM-IV)	Right unilateral, bitemporal	71.9 ± 7.8	11.2±4	8 m (29%), 20 f (71%)	MADRS (pre-ECT: 35.04 +/- 6.88, post-ECT: 9.61 +/- 11.47) <i>Mild depression</i>	MMSE (pre-ECT: 23.64 +/- 4.54, post-ECT 26.32 +/- 3.44)	3 T Philips Intera MPRAGE, TR = 9.6 s, TE = 4.6 ms, flip angle 8°, voxel size 0.98 × 0.98 × 1.2 mm ³ , slice thickness 1.2 mm, 182 slices	SPM8, VBM8 toolbox, smoothing with 8 mm ³ full width half maximum Gaussian Kernel
Cano <i>et al.</i> , 2019 (21)	24	MDD (DSM-IV)	12 right unilateral (RUL) 12 bifrontotemporal	RUL: 42.25 ± 15.78 Bifrontotemporal: 42.25 ± 15.78	RUL: 10.33±2.42 Bifrontotemporal: 11.08±1.5	RUL cohort: M 6 (50%), f 6 (50%)	RUL cohort: QIDS (pre-ECT: 17.42 +/- 3.34, post-ECT: 11 +/- 4.90)	Not reported	RUL cohort: Siemens Skyra 3.0- Tesla magnet scanner	SPM12, smoothing with 6-mm full-width at half maximum isotropic

			mporal (2 cohorts)	59.17 ± 8.02		Bifrontotemporal cohort: m 6 (50%), f 6 (50%)	RUL: mild depression Bifrontotemporal cohort: HAMD-21 (pre-ECT: 31.25 +/- 9.21, post-ECT: 2.92 +/- 2.54) Bifrontotemporal: Not depressed		TR = 2,530 ms, multi-echo time=1.69, 3.55, 5.41, and 7.27 ms, flip angle 7°, field of view 256x256 mm, matrix size=256x256 pixels, in-plane resolution=1x1 mm², slice thickness=1 mm, 156 slices Bifrontotemporal cohort: Philips Achieva 3.0-Tesla magnet scanner TR = 8.1 ms, TE = 3.7 ms, flip angle 8°, field of view 240x240 mm, matrix size=256x256 pixels, in-plane resolution=0.94x0.94 mm², slice thickness 1 mm, 160 slices	Gaussian kernel
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Dukart <i>et al.</i> , 2014 (1)	10	5 unipolar MDD, 5 bipolar MDD – 4 initially manic (DSM-IV)	Right unilateral	53.9 ± 10.7	not reported	4 m (40%), 6 f (60%)	HAMD-17 (pre-ECT: 21.8 +/- 5.9, “significant improvement” after ECT) YMRS (pre-ECT: 25.0 only obtained for one patient) N/A <i>Not reported</i>	Not reported	1.5T Magnetom VISION scanner (Siemens) MP-RAGE , TR = 11.4 ms, TE = 4.4 ms, flip angle 30°, field of view 269 mm, slice thickness 1.05 mm, pixel: 1.05 × 1.05 mm , slab 161 mm, matrix size = 256 × 256), 154 slices	SPM8, smoothing with 8mm full width at half maximum Gaussian Kernel
Nickl-Jockschat <i>et al.</i> , 2016 (22)	21	MDD (ICD-10: F32.1, F32.2, F32.3, F33.1, F33.2, F33.3)	Right unilateral, in 12 switch to left anterior right temporal	55.5 ± 9.9	10.4	15 m (71%), 6 f (29%)	HAMD-17 (pre-ECT: 25.4 +/- 5.1, post-ECT: 10.7 +/- 6.5) <i>Mild depression</i>	Not reported	3T Tim Trio (Siemens) TR = 1900 ms, TE = 2.52 ms, flip angle = 9°, 1.00-mm isotropic resolution, image matrix = 256 × 256 × 176	SPM8, VBM8 toolbox, smoothing with 8-mm full width at half maximum (FWHM)
Ota <i>et al.</i> , 2015 (23)	15	MDD (DSM-IV)	bilateral	52.17 ± 14.4	9±2.3	9 m (60%), 6 f (40%)	HAMD-21 (pre-ECT: 19.7 +/- 2.1, post-ECT: vs. 8.5 +/- 6.5) <i>Mild depression</i>	Not reported	Magnetom Symphony 1.5-tesla (Siemens), TR = 1580ms, TE = 2.64ms, flip angle = 15°,	SPM8, Easy Volume toolbox, smoothing with 8-mm full width at half maximum

									field of view 256×315 mm ² , slice thickness 1.23 mm, slab thickness = 177 mm, matrix: 208×256, field of view = 256×315 mm ² , 144 slices	Gaussian kernel.
Redlich <i>et al.</i> , 2016 (24)	23	MDD (DSM-IV)	Unilateral , in 3 switch to Bilateral	45.7 ± 9.8	14±3.8	9 m (39%), 14 f (61%)	HAMD-17 (pre- ECT: 26.0 +/- 6.5, post-ECT: 13.1 +/- 7.1) BDI (pre-ECT: 30.9 +/- 10.2, post- ECT: 22.4 +/- 10.4) <i>Mild depression</i>	Not reported	Gyrosan Intera 3T (Philips) 3D fast gradient echo sequence (TFE), TR = 7.4 ms, TE =3.4 ms, flip angle =9°, 2 signal averages, inversion prepulse every 814.5ms, acquired over a field of view of 256x204x160m m, voxel size = 0.5x0.5x0.5 mm.	SPM8, VBM8 toolbox, smoothing with Gaussian kernel of 8 mm FWHW
Sartorius <i>et al.</i> , 2016 (25)	18	MDD (DSM-IV)	right unilateral	52 ± 14	11.3±4.8	9 m (50%), 9 f (50%)	HAMD-21 (pre- ECT: 31.8 +/- 8.2, post-ECT: 10.6 +/- 7.3) <i>Mild depression</i>	MMSE (pre-ECT: 27.9 +/- 1.8, post- ECT: 26.9 +/- 4.75)	3T Tim Trio (Siemens) MP-RAGE, TR = 1570 ms, TE = 2.75 ms, flip angle 15°, voxel size 1x1x1 mm ³ , 256 mm field of	SPM12, VBM8 toolbox, smoothing with 8 mm ³ isotropic Gaussian kernel

									view, 192 sagittal slices	
Sartorius <i>et al.</i> , 2019 (15)	92	MDD (DSM-IV)	69 right unilateral, 12 bilateral, 3 different electrode positions, 8 switch in electrode position	50 ± 12	12±4.1	50 m (54%), 42 f (46%)	HAMD-21 (pre-ECT: 26.1 +/- 7.0, post-ECT: 11.4 +/- 7.4) <i>Mild depression</i>	MMSE (pre-ECT: 27.9 +/- 1.9, post-ECT: 27.9 +/- 3.5) <i>Initial MMSE for 37, final MMSE for 35 patients reported</i>	Cohorts from Mannheim, Heidelberg, Aachen: 3T Tim Trio (Siemens), MP-RAGE, 192 sagittal slices, field of view 256 mm, voxel size 1x1x1 mm Münster: 3T (Intera), TFE, field of view 256x204x160, voxel size 0.5x0.5x0.5 mm Göttingen: MR: MP-RAGE, field of view 256 mm, voxel size 1x1x1	SPM12, VBM8 toolbox, smoothing with 8 mm kernel
Thomann <i>et al.</i> , 2017 (26)	21	12 MDD, 9 schizophrenia (DSM-IV)	Right unilateral	SZ 34.2 ± 12.3 MDD 46.3	11.3±1.7	10 m (48%), 11 f (52%)	PANSS (sum) (pre-ECT: min/max: 60/119, post-ECT: min/max: 44/87) HAMD-17 (pre-ECT: min/max:	Not reported	3T Tim Trio (Siemens) MP-RAGE, TR = 1.57 s, TE = 2.74 ms, flip angle 15°, voxel size 1 mm ³	SPM12, VBM8 toolbox, smoothing with isotropic Gaussian kernel with full-width at a half-maximum of 8 mm

				$\pm$ 11.3			7/38, post-ECT: in/max 1/15) <i>Not depressed to moderate depression</i>		(image matrix = 256 x 256 x 192)	
Wang <i>et al.</i> , 2017 (27)	23	MDD (DSM-IV)	Bifrontal	38.74 $\pm$ 11.02	7.26 $\pm$ 3	11 m (48%), 12 f (52%)	HAMD-17 (pre- ECT: 22.22 +/- 4.74, post-ECT: 3.83 +/- 2.15) <i>Not depressed</i>	Not reported	3.0 T whole- body MRI system (Signa HDxt, GE Healthcare) 3D inversion recovery prepared fast spoiled gradient recalled sequence, TR = 8.676ms, TE = 3.184 ms, flip angle 8°, voxel size 1x1x1mm ³ , field of view 256 x 256 mm ² , matrix size 256x256, slice thickness 1mm, 188 sections	SPM 8, VBM8 toolbox, smoothing with Gaussian kernels with different full- width at half- maximum (FWHM1/44, 6, 8 and 10) to smooth the normalized gray matter images for the subsequent statistical analyses.
Xu <i>et al.</i> , 2019 (28)	11 (only 8 all MRIs)	MDD (DSM-IV)	Bilaterally on the forehead	39.27 $\pm$ 7.84	7.9 $\pm$ 1.2	5 m (45%), 6 f (55%)	HAMD-17 (pre- ECT: 23.27 +/- 4.11, post-ECT: 4.13 +/- 1.83) <i>Not depressed</i>	Not reported	MAGNETOM Skyra (Siemens) rapid gradient echo sequence, TR = 1600 ms, TE = 2.6 ms, flip angle 9°, field of	SPM12, VBM toolbox, smoothing with Gaussian kernel with 8- mm full width

									view 256 mm × 224 mm, 176 slices, matrix 256 × 224, in-plane resolution 1 × 1 mm ²	at half maximum
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