Supplementary materials

Corticospinal tract wiring and brain lesion characteristics in unilateral cerebral palsy: determinants of upper limb motor and sensory function

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Table 1. Descriptive information of the distribution of the lesion location and extent according to the lesion timing groups.

			PV lesions	CSC lesions
PLIC	**Affected**	N (%)	26 (61%)	17 (40%)
	Not affected	N (%)	8 (89%)	1 (11%)
Frontal lobe		Me (IQR)	1 (0)	1.50 (1.13)
Parietal lobe		Me (IQR)	1.75 (1)	3 (0.63)
Basal ganglia and thalamus		Me (IQR)	0 (1)	2 (4.63)
Lesion extent		Me (IQR)	5.75 (4)	12 (2)

PLIC, posterior limb of the internal capsule; PV, periventricular; CSC, cortico-subcortical.

Table 2. Descriptive statistics (X (SD)) and univariate analysis of upper limb motor function according to the CST wiring and the brain lesion characteristics.

	Grip strength			JTHFT			AHA	
	R^2 (p-value)	Aff. Hand (Kg)	Ratio (Non-aff/Aff)	R^2 (p-value)	Aff. Hand (s)	Ratio (Non-aff/Aff)	R^2 (p-value)	Log units
CST wiring	0.47 (<0.0001)			0.46 (<0.0001)			0.52 (<0.0001)	
Contralateral		14.45 (6.84)	1.45 (0.53)		71.72 (55.89)	1.89 (1.13)		81.31 (8.57)
Bilateral		7.57 (8.54)	3.27 (1.67)		196.25 (142.66)	5.30 (2.82)		61.63 (11.06)
Ipsilateral		6.16 (4.51)	3.97 (2.01)		239.29 (169.78)	5.99 (3.29)		57.26 (11.07)
Timing	0.14 (0.008)			0.23 (<0.001)			0.14 (0.008)	
PV		11.32 (8.23)	2.50 (1.74)		115.55 (89.32)	3.35 (2.39)		70.09 (13.34)
CSC		5.32 (3.72)	3.80 (1.87)		278.94 (181.65)	6.56 (3.36)		59.00 (14.40)
Location								
PLIC **Not affected**	0.19 (0.001)	16.52 (6.76)	1.37 (0.22)	0.16 (0.004)	65.63 (21.16)	1.86 (0.51)	0.20 (0.001)	81.00 (7.25)
Affected		7.84 (6.88)	3.25 (1.90)		193.23 (155.40)	4.97 (3.19)		62.81 (13.55)
Basal ganglia and thalamus	0.09 (0.03)			0.16 (0.004)			0.12 (0.01)	
Frontal lobe	0.08 (0.04)			0.23 (<0.001)			0.16 (0.003)	
Parietal lobe	0.15 (0.005)			0.15 (0.006)			0.12 (0.01)	
Ipsilesional extent	0.20 (<0.001)			0.30 (<0.0001)			0.27 (<0.0001)	

CST, corticospinal tract; PV, periventricular lesión; CSC, cortico-subcortical; PLIC, posterior limb of the internal capsule; JTHFT, Jebsen-Taylor Hand Function Test; AHA, Assisting Hand Assessment; Kg, kilograms; s, seconds; Aff, affected; Non-aff, non-affected; R^2, R-squared value from the regression model; p-value, probability value based on the regression model.

Table 3. Descriptive statistics (Me (IQR)) and univariate analysis of upper limb sensory function (3A, stereognosis and 3B, two-point discrimination and thresholds of touch sensation) according to the CST wiring and the brain lesion characteristics.

3A. Stereognosis

		Wald Chi^2 (p-value)	Stereognosis (number of objects correctly recognized)						
			0	1	2	3	4	5	6
CST wiring	N (%)	14.97 (0.001)							
Contralateral			0 (0%)	0 (0%)	1 (25%)	0 (0%)	0 (0%)	1 (11%)	13 (72%)
Bilateral			4 (80%)	0 (0%)	2 (50%)	0 (0%)	3 (43%)	3 (33%)	3 (17%)
Ipsilateral			2 (20%)	2 (100%)	1 (25%)	1 (100%)	4 (57%)	5 (56%)	2 (11%)
Timing	N (%)	19.05 (<0.0001)							
PV			0 (0%)	0 (0%)	1 (25%)	0 (0%)	5 (71%)	6 (67%)	17 (94%)
CSC			5 (100%)	2 (100%)	3 (75%)	1 (100%)	2 (29%)	3 (33%)	1 (6%)
Location	N (%)								
PLIC Not affected		4.57 (0.03)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (22%)	5 (28%)
Affected			5 (100%)	2 (100%)	4 (100%)	1 (100%)	7 (100%)	7 (78%)	13 (72%)
Basal ganglia and thalamus	Me (IQR)	20.28 (<0.0001)	3 (1)	2 (0)	1.5 (1.75)	3 (-)	1 (1)	0 (2)	0 (1)
Frontal lobe	Me (IQR)	17.88 (<0.0001)	2.50 (1)	2.25 (-)	1.50 (1.50)	3 (-)	1 (0.50)	1 (0.63)	1 (0.13)
Parietal lobe	Me (IQR)	13.78 (<0.001)	3 (0.25)	3 (0)	2.75 (1.25)	2 (-)	2 (1.50)	2 (1.38)	1.75 (2)
Ipsilesional extent	Me (IQR)	21.20 (<0.0001)	13 (2.07)	13 (-)	10 (3.88)	15.50 (-)	6 (3.50)	7 (4.25)	5.25 (3.75)

Table 3 (continuation).

3B. Two-point discrimination and touch sensation

		Two-point discrimination			Thresholds of touch sensation					
		Wald Chi^2 (p-value)	Normal	Impaired	Wald Chi^2 (p-value)	Normal	Diminished light touch	Diminished protective sensation	Loss of protective sensation	Untestable
CST wiring	N (%)	6.71 (0.04)			1.74 (0.42)					
Contralateral			14 (50%)	1 (6%)		6 (26%)	0 (0%)	1 (25%)	0 (0%)	0 (0%)
Bilateral			7 (25%)	8 (44%)		9 (39%)	0 (0%)	0 (0%)	3 (50%)	2 (100%)
Ipsilateral			7 (25%)	9 (50%)		8 (34%)	0 (0%)	7 (75%)	3 (50%)	0 (0%)
Timing	N (%)	18.57 (<0.0001)			10.64 (0.001)					
PV			26 (93%)	3 (17%)		18 (78%)	0 (0%)	1 (25%)	0 (0%)	0 (0%)
CSC			2 (7%)	15 (83%)		5 (22%)	0 (0%)	3 (75%)	6 (100%)	2 (100%)
Location	N (%)									
PLIC **Not affected**		1.85 (0.17)	6 (21%)	1 (6%)	0.00 (0.99)	2 (9%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Affected			22 (79%)	17 (94%)		21 (91%)	0 (0%)	4 (100%	6 (100%)	2 (100%)
Basal ganglia and thalamus	Me (IQR)	11.08 (0.001)	0.50 (1)	2 (2)	9.97 (0.002)	1 (2)	-	1.50 (2.50)	2.50 (1.25)	2.50 (-)
Frontal lobe	Me (IQR)	9.41 (0.002)	1 (0)	1.50 (1.25)	12.83 (<0.001)	1 (0)	-	1.50 (1.88)	2.75 (1.50)	2.25 (-)
Parietal lobe	Me (IQR)	10.80 (0.001)	1.50 (1.13)	3 (0.75)	8.55 (0.003)	1.5 (1)	-	2.50 (2.50)	3 (0.13)	3 (0)
Ipsilesional extent	Me (IQR)	12.74 (<0.0001)	5.25 (4)	12.50 (4.75)	10.75 (0.001)	6 (4.50)	-	10.50 (11.25)	13 (2.41)	12.50 (-)

CST, corticospinal tract; PV, periventricular lesion; CSC, cortico-subcortical; PLIC, posterior limb of the internal capsule; Aff, affected; Non-aff, non-affected; p-value, probability value based on the regression model.