

Title:

Investigation of Sensory and Neuropsychological Parameters in Migraine Sufferers: A Cross-Sectional Study with Negative Findings

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Supplementary material 1

QST – Results Migraine Group.

Variable	Min	1st Quartile	Mean	Median	3rd Quartile	Max
Cold detection threshold hand	30.08	31.68	31.6748889	31.75	31.90	32.00
Cold detection threshold right forehead	30.66	31.72	31.8006667	31.90	31.92	32.64
Cold detection threshold left forehead	30.88	31.72	31.7588889	31.75	31.91	31.99
Warm detection threshold hand	32.08	32.36	33.7262222	32.80	33.34	46.98
Warm detection threshold right forehead	32.00	32.10	32.7502222	32.28	32.67	37.74
Warm detection threshold left forehead	32.01	32.21	32.6393333	32.30	32.58	37.42
TSL hand	1.33	3.41	5.4173333	4.46	6.17	13.67
TSL right forehead	0.90	1.45	2.7415556	2.42	3.27	8.80
TSL left forehead	0.75	1.5	2.8428889	2.12	3.59	10.19
Heat pain threshold hand	35.65	40.02	43.5984444	44.68	47.11	49.99
Heat pain threshold right forehead	35.50	37.94	41.8248889	41.62	45.10	50.00
Heat pain threshold left forehead	34.72	38.93	41.9302222	41.44	45.88	50.00
Cold pain threshold hand	20.00	20.00	23.6580000	22.71	27.13	30.75
Heat pain threshold right forehead	20.00	20.00	23.1900000	22.28	26.83	30.13
Heat pain threshold left forehead	20.00	20.00	24.0437778	23.54	26.83	30.13
Mechanical detection threshold hand	0.18	0.66	2.1048889	1.15	2.46	13.93
Mechanical detection threshold right forehead	0.18	0.22	0.8146667	0.31	0.41	8.57
Mechanical detection threshold left forehead	0.18	0.19	1.0111111	0.23	0.57	14.93

Mechanical pain threshold hand	10.56	29.86	117.7051111	59.71	168.90	477.71
Mechanical pain threshold right forehead	8.57	19.70	48.1626667	27.86	55.72	337.79
Mechanical pain threshold left forehead	8.00	18.38	42.8737778	25.99	42.22	315.17
S/R function hand	0.15	1.68	3.9882222	3.12	4.45	14.39
S/R function right forehead	0.17	1.96	5.3704444	3.46	6.50	27.09
S/R function left forehead	0.16	2.21	6.0328889	4.02	7.05	27.09
Wind-up ratio hand	0.74	1.38	2.8002222	1.99	3.24	9.67
Wind-up ratio right forehead	1.02	1.57	3.7193333	2.83	5.43	13.89
Wind-up ratio left forehead	1.04	1.86	3.3975556	2.71	4.56	9.55
Vibration detection threshold hand	6.83	8.00	7.9740000	8.00	8.00	8.00
Vibration detection threshold right forehead	6.00	7.50	7.6813333	8.00	8.00	8.00
Vibration detection threshold left forehead	5.50	7.50	7.7106667	8.00	8.00	8.00
Pressure pain threshold hand	2.40	4.00	5.3768889	5.43	6.33	10.00
Pressure pain threshold right forehead	1.40	1.93	2.7133333	2.30	3.27	8.67
Pressure pain threshold left forehead	1.47	2.00	2.6708889	2.43	3.13	6.87

Abbreviations: QST=quantitative sensory testing, TSL=thermal sensory limen, S/R=stimulus/response

QST Results – Control group.

Variable	Min	1st Quartile	Mean	Median	3rd Quartile	Max
Cold detection threshold hand	30.78	31.61	31.6812	31.72	31.90	31.92
Cold detection threshold right forehead	30.88	31.76	31.8204	31.90	31.92	32.00
Cold detection threshold left forehead	31.45	31.79	31.8620	31.91	31.92	32.00
Warm detection threshold hand	32.03	32.32	32.8268	32.63	33.07	34.97
Warm detection threshold right forehead	32.00	32.08	32.4952	32.10	32.32	36.83
Warm detection threshold left forehead	32.00	32.18	32.5724	32.29	32.49	38.54
TSL hand	1.53	2.55	3.9600	3.24	5.04	8.13
TSL right forehead	0.87	1.31	2.3028	2.16	2.97	5.22
TSL left forehead	0.89	1.11	1.9752	1.56	2.75	4.60
Heat pain threshold hand	35.83	42.66	44.7600	45.62	48.11	49.42
Heat pain threshold right forehead	36.08	41.44	44.1824	45.44	47.05	49.34
Heat pain threshold left forehead	37.47	42.31	44.5224	44.90	47.83	49.39
Cold pain threshold hand	20.00	20.00	21.8956	20.00	23.92	30.36
Heat pain threshold right forehead	20.00	20.00	22.5628	20.00	23.82	29.44
Heat pain threshold left forehead	20.00	20.00	22.4692	20.00	23.69	30.31
Mechanical detection threshold hand	0.27	0.47	1.7136	0.87	2.00	12.13
Mechanical detection threshold right forehead	0.18	0.20	0.3948	0.28	0.44	1.62
Mechanical detection threshold left forehead	0.18	0.18	0.2596	0.23	0.29	0.47
Mechanical pain threshold hand	19.70	55.72	115.7264	103.97	157.59	294.07
Mechanical pain threshold right forehead	12.13	27.86	58.8720	42.22	78.79	157.59
Mechanical pain threshold left forehead	12.13	21.11	57.4420	36.76	84.45	194.01

S/R function hand	0.40	2.63	5.8496	3.60	7.90	24.80
S/R function right forehead	0.55	3.14	6.4300	3.95	6.78	25.68
S/R function left forehead	0.66	2.99	7.1944	3.79	9.94	27.47
Wind-up ratio hand	0.93	1.60	3.2526	2.43	4.00	9.43
Wind-up ratio right forehead	1.10	2.30	3.4712	3.40	4.21	8.50
Wind-up ratio left forehead	1.21	2.15	3.5220	3.33	4.37	6.81
Vibration detection threshold hand	8.00	8.00	8.0000	8.00	8.00	8.00
Vibration detection threshold right forehead	7.00	7.83	7.8728	8.00	8.00	8.00
Vibration detection threshold left forehead	6.33	7.50	7.6668	8.00	8.00	8.00
Pressure pain threshold hand	2.97	4.70	6.1928	5.30	8.50	9.80
Pressure pain threshold right forehead	1.57	2.20	2.9348	2.70	3.47	4.87
Pressure pain threshold left forehead	1.73	2.37	2.9928	2.63	3.57	5.00

Abbreviation: QST=quantitative sensory testing, TSL=thermal sensory limen, S/R=stimulus/response

Supplementary material 2

Comparison between groups QST.

Variable	p-Wert
Cold detection threshold hand	1.0000
Cold detection threshold right forehead	1.0000
Cold detection threshold left forehead	0.4368
Warm detection threshold hand	1.0000
Warm detection threshold right forehead	1.0000
Warm detection threshold left forehead	1.0000
TSL hand	1.0000
TSL right forehead	1.0000
TSL left forehead	1.0000
Heat pain threshold hand	1.0000
Heat pain threshold right forehead	0.8112
Heat pain threshold left forehead	0.4590
Cold pain threshold hand	1.0000
Heat pain threshold right forehead	1.0000
Heat pain threshold left forehead	1.0000
Mechanical detection threshold hand	1.0000
Mechanical detection threshold right forehead	1.0000
Mechanical detection threshold left forehead	1.0000
Mechanical pain threshold hand	1.0000
Mechanical pain threshold right forehead	1.0000
Mechanical pain threshold left forehead	1.0000
S/R function hand	1.0000
S/R function right forehead	1.0000
S/R function left forehead	1.0000

Wind-up ratio hand	1.0000
Wind-up ratio right forehead	1.0000
Wind-up ratio left forehead	1.0000
Vibration detection threshold hand	1.0000
Vibration detection threshold right forehead	1.0000
Vibration detection threshold left forehead	1.0000
Pressure pain threshold hand	1.0000
Pressure pain threshold right forehead	1.0000
Pressure pain threshold left forehead	1.0000

Abbreviations: QST=quantitative sensory testing, TSL=thermal sensory limen, S/R=stimulus/response

Supplementary material 3

Monotonic correlations between DASS and QST Control Group.

Parameter	Spearman's coefficient
Warm detection threshold	$\rho = -0.23799260^*$
Heat pain threshold hand	$\rho = -0.31238963^*$
Heat pain threshold right forehead	$\rho = -0.33063315^*$
Heat pain threshold left forehead	$\rho = -0.43216495^*$
Cold pain threshold hand	$\rho = 0.35715500^*$
Cold pain threshold right forehead	$\rho = 0.41238320^*$
Cold pain threshold left forehead	$\rho = 0.48377337^*$
Mechanical pain threshold right forehead	$\rho = 0.24811619^*$
Wind-up ratio hand	$\rho = -0.35205226^*$
Wind-up ratio left forehead	$\rho = -0.26832301^*$
Pressure pain threshold hand	$\rho = -0.25118773^*$
Pressure pain threshold right forehead	$\rho = -0.36784207^*$
Pressure pain threshold left forehead	$\rho = -0.38674073^*$
TSL difference hand	$\rho = -0.36373541^*$
TSL difference right forehead	$\rho = -0.24987275^*$
TSL difference left forehead	$\rho = -0.30193086^*$
*Weak to moderate monotonic correlation	

Abbreviations: DASS=Depression, Anxiety and Stress Scale, QST=quantitative sensory testing, TSL=thermal sensory

simen, S/R=stimulus/response

Supplementary material 4

Monotonic correlations between WUR and CPM.

Variable	Migraine Group Spearman's ρ	Control Group Spearman's ρ
<i>Wind-up ratio hand</i>		
PPT thenar muscle	0.3024344*	0.28774765*
PPT M. Temp. right	0.1747925	-0.03426373
PPT M. Temp left	0.2830742*	-0.04617161
<i>Wind-up ratio right forehead</i>		
PPT thenar muscle	0.3667446*	0.17811118
PPT M. Temp. right	0.2969234*	-0.04388837
PPT M. Temp left	0.2778180*	-0.03809158
<i>Wind-up ratio left forehead</i>		
PPT thenar muscle	0.3289963*	0.095402964
PPT M. Temp. right	0.1879570	0.005004815
PPT M. Temp left	0.2633243*	-0.263178165*

*Weak to monotonic correlation

Abbreviations: WUR=wind-up ratio, CPM=conditioned pain modulation, PPT=pressure pain threshold, M=musculus