

Supplementary Material

Disease Progression of Data-Driven Subtypes of Parkinson's Disease: 5-Year Longitudinal Study from the Early Parkinson's disease Longitudinal Singapore (PALS) Cohort

Supplementary Table 1. Patients in the follow-up (%).

Visit	overall (n)	cluster A (n, %) severe cluster	cluster B (n, %) intermediate	cluster C (n, %) mild cluster
Baseline	206	43(100%)	98 (100%)	65 (100%)
2nd Year	173	35 (81.4%)	84 (85.7%)	54 (83.1%)
3rd Year	138	29 (67.4%)	65 (66.3%)	44 (67.7%)
4th Year	116	22 (51.2%)	58 (52.0%)	36 (55.4%)
5th Year	70	10 (23.3%)	36 (36.7%)	24 (36.9%)

Supplementary Table 2A. Observed average of non-motor outcomes in the follow-up among clusters.

Visit year	Cluster	NMSS Total Score	NMSSD3 Score (mood/apathy)	NMSS D4 score (perceptual problems)	NMSS D7 score (urinary)	HADS Anxiety Total score	ESS Total Score
1	1	13.15	0.81	0.27	3.65	1.79	5.37
	2	23.46	3.46	1.09	5.14	3.34	5.51
	3	31.02	2.76	1.00	9.79	2.45	8.67
2	1	16.18	1.35	0.11	3.67	1.65	4.95
	2	26.31	3.54	0.63	5.50	3.42	5.06
	3	37.06	6.24	0.18	13.12	3.53	5.94
3	1	15.43	0.80	0.30	5.05	2.00	5.20
	2	23.81	3.43	0.71	3.81	3.38	5.40
	3	44.91	11.64	1.09	9.82	5.27	8.18
4	1	17.91	2.00	0.74	4.40	2.23	4.57
	2	27.38	4.38	0.91	3.28	3.50	6.78
	3	61.00	10.20	4.20	14.70	4.20	7.30
5	1	28.41	1.55	0.36	8.77	1.59	4.73
	2	22.43	3.52	0.24	4.43	2.90	6.62
	3	58.75	11.00	8.25	15.25	6.00	5.00

Supplementary Table 2B. Observed average of motor outcomes in the follow-up among clusters.

Visit year	Cluster	H&Y score	UPDRS motor score	PIGD score
1	1	1.74	16.74	1.26
	2	1.73	19.65	1.24
	3	2.13	32.16	3.21
2	1	1.85	20.74	1.58
	2	1.89	23.16	1.72
	3	2.15	33.03	2.80
3	1	1.92	21.39	1.47
	2	1.96	25.12	2.09
	3	2.29	37.22	3.29
4	1	1.98	23.41	1.69
	2	2.03	27.35	2.06
	3	2.53	43.61	3.69
5	1	1.87	24.86	2.06
	2	1.95	27.94	2.03
	3	2.67	42.78	6.75

Supplementary Table 2C. Observed average of cognitive outcomes in the follow-up among clusters.

Visit year	Cluster	working and attention standardized score	memory standardized score	visuospatial standardized score	executive standardized score
1	1	-0.47	-1.38	-0.70	-0.37
	2	0.33	-0.15	-0.12	0.47
	3	-0.59	-1.91	-0.88	-0.94
2	1	-0.27	-1.02	-0.70	-0.31
	2	0.30	-0.01	-0.07	0.43
	3	-0.41	-1.45	-1.20	-0.83
3	1	-0.27	-0.94	-0.59	-0.40
	2	0.28	0.11	-0.01	0.51
	3	-0.43	-1.46	-1.32	-0.87
4	1	-0.25	-0.79	-0.69	-0.34
	2	0.27	0.05	-0.23	0.15
	3	-0.52	-1.61	-1.50	-0.91
5	1	0.01	-0.70	-0.81	-0.32
	2	0.16	-0.06	-0.27	0.25
	3	-0.85	-1.29	-1.80	-0.80

Supplementary Table 3. Comparison of dropout rate among different clusters.

	Cluster A (n=43)	Cluster B (n=98)	Cluster C (n=65)
Attrition at year 5	10 (23.3%)	36 (36.7%)	24 (36.9%)
Without Attrition at year 5	33 (76.7%)	62 (63.3%)	41 (63.1%)

Chi-square test was performed to compare the attrition rate among 3 clusters, $p=0.248$.