Parkinson's Disease Chronotypes: What are They? And What can They Predict?

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Objective: To identify sleep "chronotype" distribution in Parkinson's disease (PD); and its association with key features of the disease.

Background: Chronotype reflects the periodicity of biological rhythms and may have important implications with respect to clinical expression of the PD disease state.

Methods: 100 consecutive PD patients were questioned using the Horne and Ostberg's Morningness and Eveningness scale. Subjective sleepiness, depression, motor and cognitive impairment were assessed using the Epworth Sleepiness Scale (ESS), Zung Self Rating Depression Scale (ZDS), Hoehn and Yahr staging scale (H&Y), and Unified Parkinson's Disease Rating Scale (UPDRS), respectively.

Results: Chronotype distribution: 60% (60/100) were "Morning" (M) [Definitive (M++) = 12, Moderate (M+) = 48], 39% (39/100) were "Neither" (N) and 1% (1/100) were "Evening" (E) types.
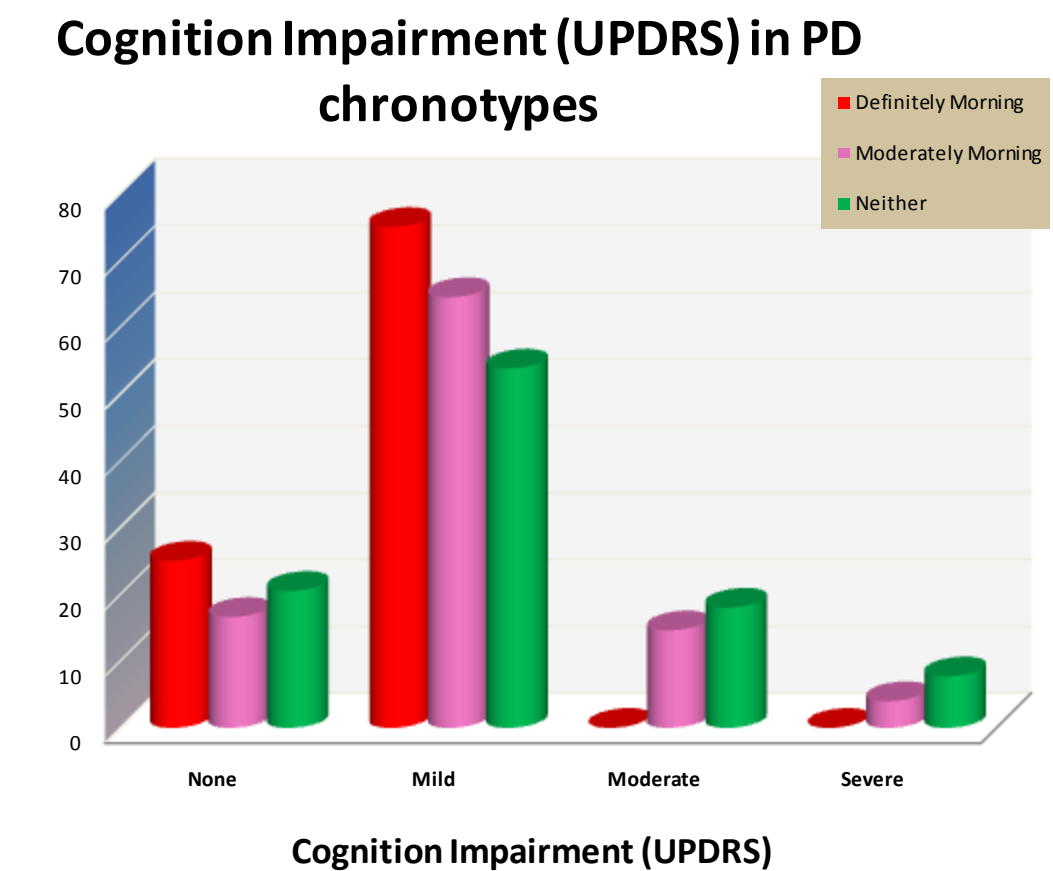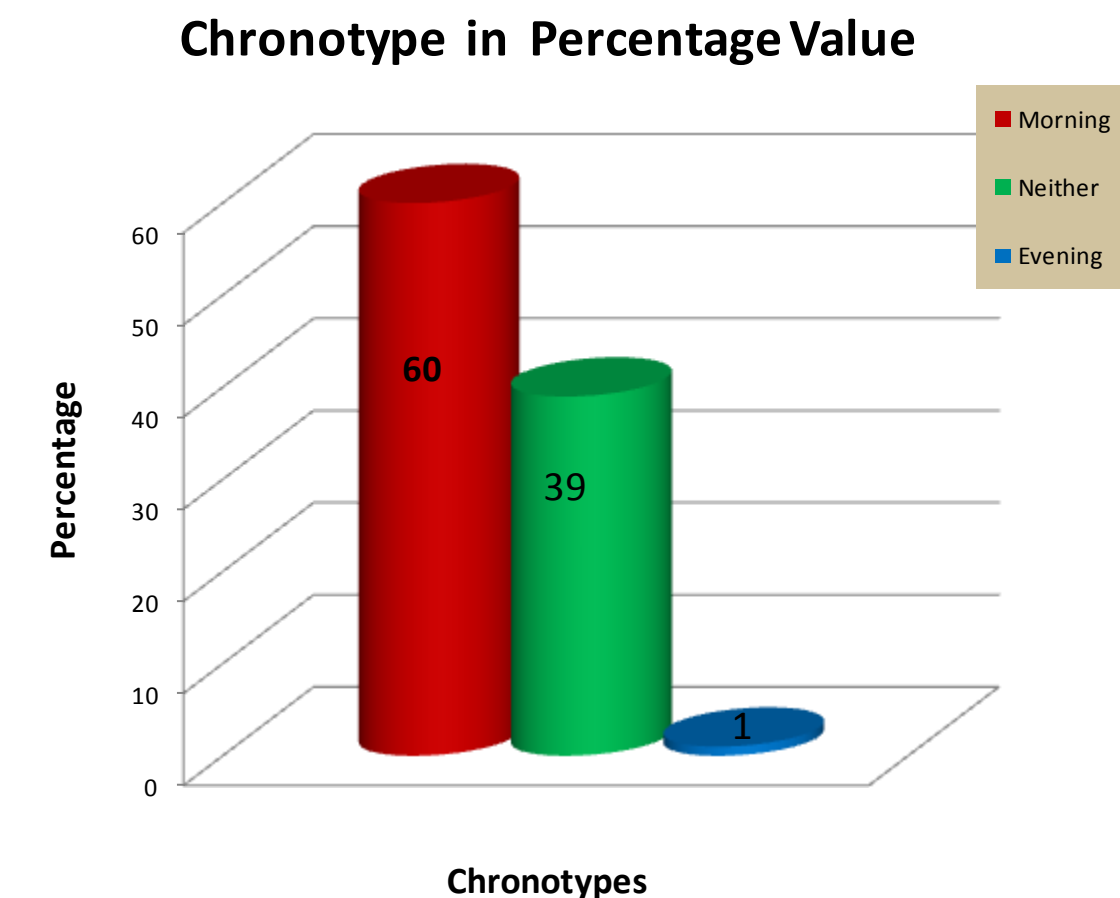
Subject characteristics: M++ [Men 100%, White 91.6%, Mean age 71.7 (54-90)]; M+ [Men 98%, White 85%, Mean age 72.6 (45-94)]; N [Men 95%, White 82%, Mean age 71.8 (49-89)]; E [Man, White, age 76]. Mean H&Y scores were 2.3, 2.77, 2.77 and 2.5 for M++, M+, N and E types, respectively.

Cognitive impairment (UPDRS- Item 1) : M++ [None (25%), Mild (75%), Severe (0%); mean = 0.75], M+ [None (16.6%) Mild (64.5%) Moderate (14.6%), Severe (4%); mean = 1.06], N [None (20.5%), Mild (53.8%), Moderate (18%), Severe (7.7%); mean = 1.13], E [Mild (100%)]

Subjective sleepiness (ESS ≥ 10): M++ [50% (6/12)], M+ [58% (28/48)], N [77% (30/39)], E [0%] ESS score was > 15 in 8%, 14.6%, 23% and 0% of subjects in M++, M, N and E groups, respectively.

Depression (ZDS ≥ 50): 0% (0/12) in M++, 8.3% (4/48) in M+, 23% (9/39) in N, 0% (0/1) in E types .

CHRONOTYPES n=100	Age (Mean)	Race (%)		Gender (%)		H&Y (Mean)
		White	Others	Male	Female	
Definitely Morning (M ++) n = 48	71.7	98	2	100	0	2.33
Moderately Morning (M +) n = 12	72.6	91.6	8.4	98	2	2.77
Neither (N) n = 39	71.8	82	18	95	5	2.77
Evening (E) n = 1	76	100	0	100	0	2.5

Chronotype in Percentage Value

Cognition Impairment (UPDRS) in PD chronotypes

ZDS scores in chronotypes
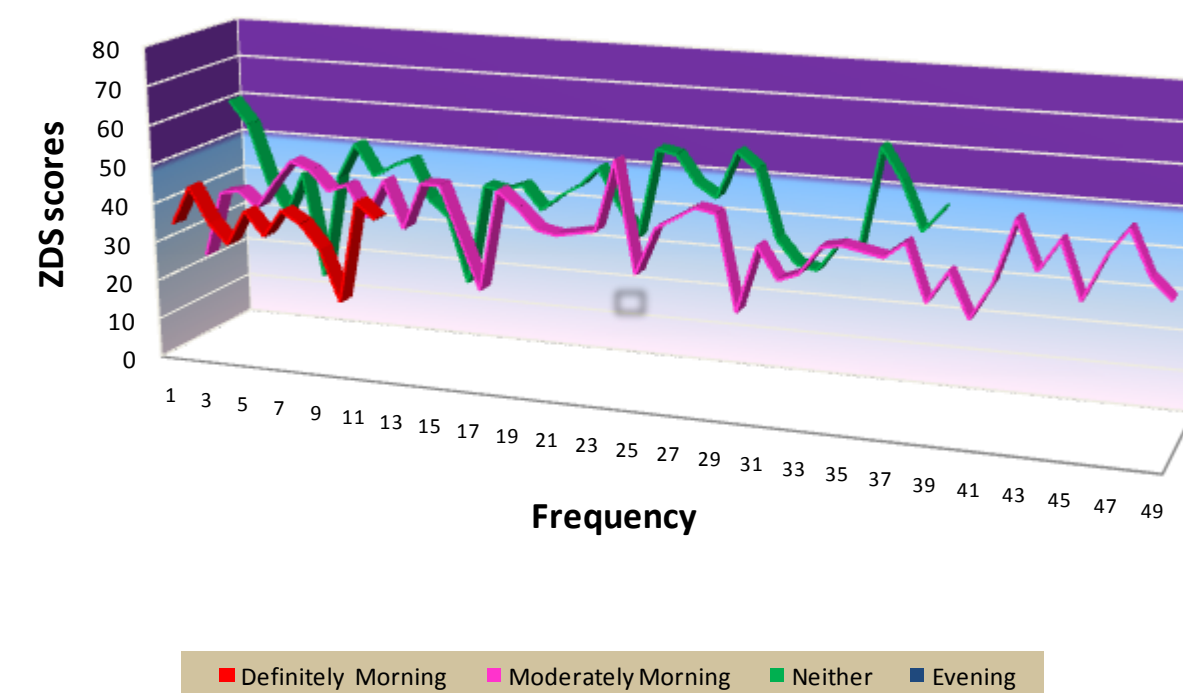
ESS scores in chronotypes
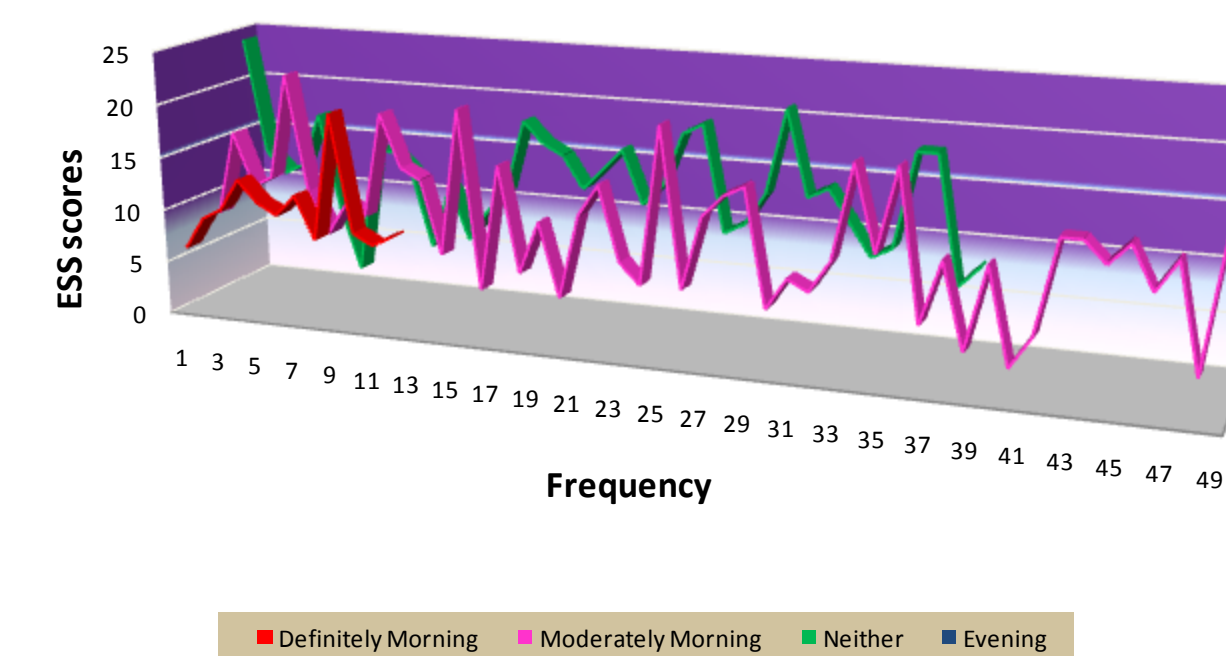
Conclusion:

"Morning" is the predominant PD chronotype followed by the "Neither" type.

Definitively Morning type (M++) has the best motor, cognitive, sleepiness and depression scores.

There appears to be a trend towards worsening intellectual performance, increasing sleepiness and depression along the gradient of shift from the "Definitively Morning"- M++ to "Moderately Morning"- M+ to the "Neither"- N types.

This phenomenon deserves further investigation.