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 Evennessness 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); 30% (30/100) were “Neither” (N) and 10% (10/100) were “Evening” (E) types.

Subject characteristics: M++ [Men 100%, White 91.8%, Mean age 71.7 (54-80)]; M+ [Men 98%, White 85%, Mean age 72.6 (45-94)]; N [Men 95%, White 82%, Mean age 71.6 (49-89)]; E [Men, 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 11: 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 (16%), Severe (7.7%); mean ± 1.13], E [Mild (100%)]

Subjectiveness (ESS ≥ 20): M++ [50% (5/12)], 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.

Conclusion: “Morning” is the predominant PD chronotype followed by the “Neither” type. Definitely 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 Definitely Morning’ M++ to the Definitely Morning’ M-, the “Neither” N types. This phenomenon deserves further investigation.

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Parkinson’s Disease Chronotypes: What are They? And What can They Predict?
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CHRONOTYPES Age H&Y
n=100 (Mean) White Others Male Female (Mean)
Definitely Morning 71.7 98 2 100 0 2.33
(M ++) n = 48
Moderately Morning 72.7 81.6 3.4 98 2 2.77
(N ++) n = 29
Neither 71.8 82 16 95 5 2.77
(N ) n = 39
Evening 78 110 3 100 0 2.5
(E ) n = 1

ZDS scores in chronotypes

ESS scores in chronotypes

Cognition Impairment (UPDRS) in PD chronotypes

Cognition Impairment (UPDRS) in PD chronotypes

Chronotype in Percentage Value

Percentage
Chronotypes
Chronotype in Percentage Value
Morning
Neither
Evening

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.