

Fluctuation-related pain in Parkinson's disease: Linking subjective ratings with objective motor scores obtained through wrist-worn wearable sensor

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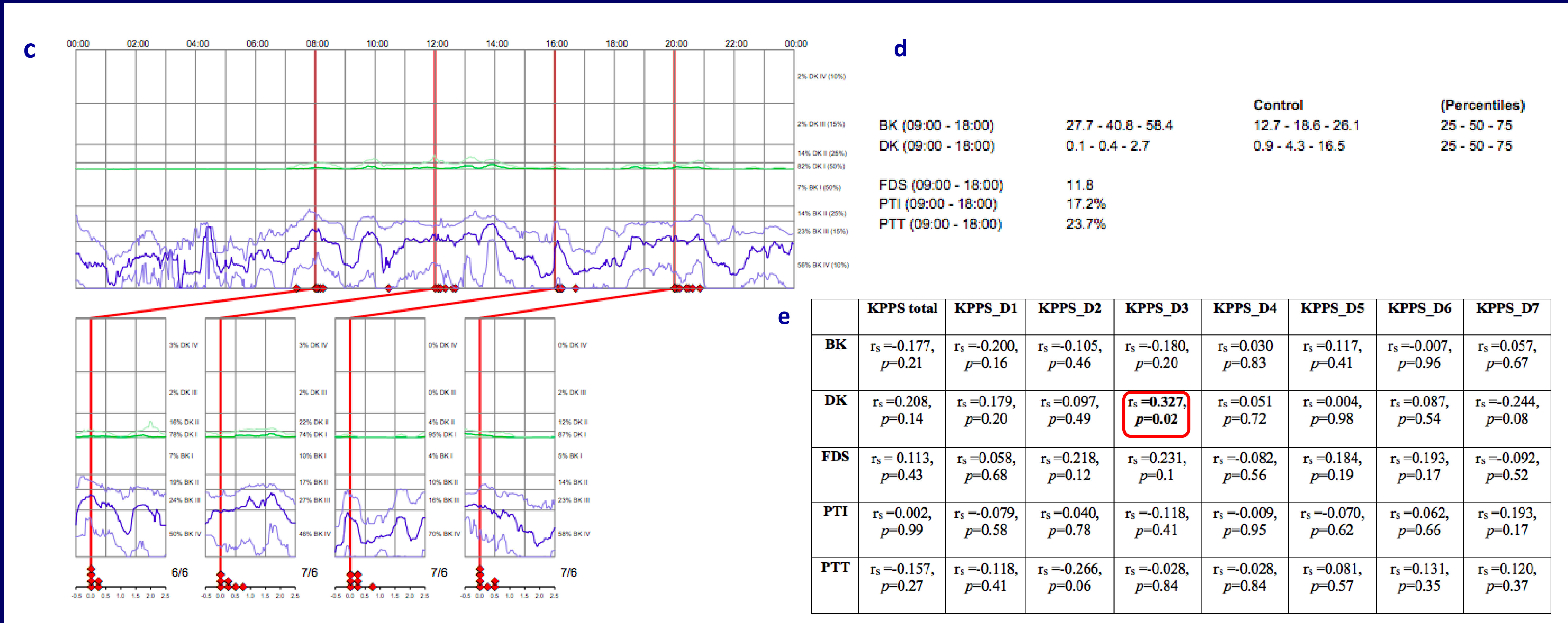
Objective	Background												
To explore whether scores obtained using the Parkinson's KinetiGraph™ (PKG, an accelerometer-based, wrist-worn device for continuous remote monitoring of motor symptoms, <i>Figure 1.b</i>) could serve as a marker for fluctuation-related pain (FP) in People with Parkinson's Disease (PD, PwP).	Chronic pain affects about 80% PwP, with major impact on quality of life; yet often remains undeclared. Objective markers could aid its recognition and support clinical decision-making (such as adjusting dopaminergic medication to ameliorate FP). ^{1,2}												
Methods	Results												
An exploratory, cross-sectional analysis of two ongoing prospective, observational studies: "Non-motor International Longitudinal Study"(UK National Institute for Health Research Clinical Research Network (UKCRN) No.10084) and "PKGReg"(UKCRN No. 215965) Clinical assessments: Hoehn and Yahr (HY) stage, King's Parkinson's Disease Pain Scale (KPPS) PKG outcome measures: Bradykinesia Score (BK), Dyskinesia Score (DK), Fluctuation and Dyskinesia Score (FDS), Percentage of Time with Tremor (PTT) and Percentage of Time Immobile (PTI) ^{3,4,5} Spearman's correlation (SPSS, Version 26)	<table border="1"> <thead> <tr> <th></th> <th>n=52</th> </tr> </thead> <tbody> <tr> <td>Age (Years; Mean±SD)</td> <td>64.94±9.74</td> </tr> <tr> <td>Sex (% female)</td> <td>48.1</td> </tr> <tr> <td>Hoehn&Yahr stage (Median, Range)</td> <td>2 (1 - 4)</td> </tr> <tr> <td>Disease duration (Years; Median, Range)</td> <td>3.5(0 - 28)</td> </tr> <tr> <td>LEDD (mg; Mean±SD)</td> <td>606.93±503.12</td> </tr> </tbody> </table> 		n=52	Age (Years; Mean±SD)	64.94±9.74	Sex (% female)	48.1	Hoehn&Yahr stage (Median, Range)	2 (1 - 4)	Disease duration (Years; Median, Range)	3.5(0 - 28)	LEDD (mg; Mean±SD)	606.93±503.12
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Figure 1. a) Patients' socio-demographic and disease-characteristic features. **b)** The wrist-worn Parkinson's KinetiGraph™ (PKG) device. **c)** An example of a PKG report in one of the participants: Graphical summary representation of the motor scores generated every 2 minutes. Values for bradykinesia (BK, blue line) and dyskinesia (DK, green line) and **d)** The 25th, 50th and 75th percentile values for: BK, DK, Fluctuation and Dyskinesia Score (FDS), Percentage of Time with Tremor (PTT) and Percentage of Time Immobile (PTI) scores. **e)** The correlation coefficients and *p* values obtained using Spearman's correlations. *KPPS* - King's Parkinson's Disease Pain Scale, *LEDD* – Levodopa Equivalent Daily Dose



Conclusion	References
Wearable sensor-based outcome measures may serve as useful objective markers to flag up the presence of FP, particularly in PwP with dyskinesia.	<p>¹Ghosh P et al. A Dual Centre Study of Pain in Parkinson's Disease and Its Relationship with Other Non-Motor Symptoms. <i>JPD</i>. 2020;10(4):1817-25. ²Rukavina K et al. Pain in Parkinson's disease: Mechanism-based treatment strategies. <i>Curr Opin Support Palliat Care</i>. 2021;15(2):108-15. ³Chaudhuri KR et al. King's Parkinson's disease pain scale, the first scale for pain in PD: An international validation. <i>Mov Dis</i>, 2015;30(12):1623-31. ⁴Hoehn MM et al. Parkinsonism: onset, progression and mortality. <i>Neurology</i>. 1967;17(5):427-42. ⁵Griffiths RI et al. Automated assessment of bradykinesia and dyskinesia in Parkinson's disease. <i>JPD</i> 2012;2(1):47-55.</p>