Relationship between Serum Urate and Clinical Features in Early Parkinson's Disease: PPMI Baseline Data (Poster #495)

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Objective: To investigate serum urate (S-urate) levels and their relationship with clinical features and cerebrospinal fluid (CSF) α-synuclein levels at baseline in the early Parkinson's disease (PD), healthy control (HC), and Scans Without Evidence of Dopaminergic Deficit (SWEDD) cohort enrolled in the Parkinson Progression Marker Initiative (PPMI) study.

Background: Previous studies found that higher S-urate levels and higher dietary urate intake were associated with a lower risk for developing PD, and with slower disease progression, better cognitive performance, and reduced loss of striatal [123I] β-CIT uptake in those already having PD [1-2].

Methods: Cross-sectional sub-analysis of PPMI baseline data for 680 enrolled subjects (PD=422 [276 M, 146 F], HC=195 [125 M, 70 F], SWEDD=63 [39 M, 24 F]). S-urate was measured by a commercial laboratory (Covance). CSF α-synuclein was analyzed using a commercially available ELISA (only a proportion of the results were available for this analysis). Clinical features were assessed per PPMI protocol. ANOVAs were used to assess differences in means in regard to demographics, clinical parameters, S-urate and CSF α-synuclein among the different diagnostic groups. Within PD subjects, the association of S-urate with clinical variables and CSF α-synuclein was investigated using linear regressions adjusted for age and disease duration. The PD cohort was analyzed by gender both as a whole and divided in three subgroups based on motor phenotype (tremor dominant=TD, postural instability gait disturbance dominant=PIGD and Intermediate).

Results: Means of baseline demographics and clinical characteristics, and comparisons among groups

	PD	TD	PIGD	INTERMEDIATE	HC	SWEDD	Difference among groups*
N	422	301	74	46	195	63	Not applicable
% males	65%	66%	61%	67%	64%	62%	NS
Age (years)	61.7	62.0	62.0	59.3	60.7	61.0	NS
Disease duration (months)	6.6	6.8	5.7	6.8	NA	7.5	NS
UPDRS total	32	32	35	32	5	28	p<0.05
UPDRS part 3 (motor)	21	21	21	19	1	14	p<0.05
MOCA	27	27	27	27	28	27	p<0.05
GDS total	2	2	3	3	1	3	p<0.05
Symbol Digits	41	41	41	42	47	41	p<0.05
Schwab & England	93	94	92	93	-	95	p<0.05
Putamen binding ratio	0.7	0.7	0.6	0.7	1.3	1.3	p<0.05
α-synuclein (pg/ml)	1082	1185	893	783	1264	1413	NS
S-urate (umol/L)	318	321	309	307	320	321	NS

** ANOVAs comparing PD, HC, SWEDD; and TD, PIGD, Intermediate, HC and SWEDD. NS=not significant (p>0.05)*

Results: Mean serum urate levels in PD, HC and SWEDD, by gender (umol/L)

	PD		TD		PIGD		Intermediate		HC		SWEDD	
	Females	***Males***	***Females***	***Males***	***Females***	***Males***	***Females***	***Males***	***Females***	***Males***	***Females***	***Males***
N	144	267	99	194	29	43	15	30	69	121	24	37
S-Urate	257	351	258	353	246	351	261	331	269	350	285	343

Results:

Serum urate levels in the different diagnostic groups:
S-urate levels were not significantly different in PD (both all PD and PD motor phenotype subgroups) compared with HC and SWEDD, in either gender.

Associations with serum urate levels: In PD males, S-urate levels were positively associated with UPDRS part 3 (in the whole PD group [p=0.04] and in the TD subgroup [p=0.04]), and negatively associated with α-synuclein levels (in the PIGD subgroup only [p=0.001]). There were no other significant associations between S-urate levels and clinical features or with CSF α -synuclein levels.

Conclusions: According to these preliminary results, there was no significant difference in baseline S-urate levels in PD subjects compared with HC and SWEDD. Baseline S-urate levels were not associated with various clinical features at early PD stages in the PPMI population, with the exception of PD males where significant associations were found with UPDRS part 3 (in all PD and in the TD subgroup) and with CSF α -synuclein levels (in the PIGD subgroup). Additional, more detailed analyses are underway.

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Source of PPMI data: http://www.ppmi-info.org/

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