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ACTIVITIES OF DAILY LIVING
– OUTCOME DURING TWO YEARS IN GALANTAMINE TREATED ALZHEIMER PATIENTS

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Objective

To analyse and present the outcome of longitudinal change in ADL function and cognition in patients treated with galantamine for two years.

Methods and Subjects

The Swedish Alzheimer Treatment Study (SATS) is an open, long-term, multicentre study in a routine clinical setting. Patients with the diagnosis of Alzheimer's Disease received the cholinesterase inhibitor galantamine. The 122 patients were assessed with several functional and cognitive rating scales including IADL, PSMS, FAST, MMSE and ADAS-cog at baseline and every 6 months for a total period of two years.

The expected rate of IADL decline in untreated patients has been calculated using a linear equation as presented by Green et al.[1, 2]:

$$\Delta IADL = 10{,}124 - 0{,}332 * IADL_{Bas}$$

in which $\Delta IADL$ is the annual rate of decline of IADL and $IADL_{Bas}$ is the IADL score at baseline.

A two-step cluster analysis was performed to reveal any natural groupings (clusters) of the patients based on the ADL scores at baseline.

Baseline characteristics	
Number of patients (n)	122
Gender (males/females)	39 % / 61 %
Galantamine mean dose mg/day)	15.5 - 19.4
2 year completion rate	78 %
Age at investigation*	72.4 ± 7,7
Duration, years*	3.0 ± 2.0
MMSE*	23.2 ± 4.2
ADAS-cog*	17.2 ± 8.4
IADL*	13.7 ± 5.1
PSMS*	7.0 ± 2,1
FAST*	3.4 ± 1.2

*mean ± SD

IADL – Instrumental activities of daily living scale (8 – 31)
PSMS – Physical Self–Maintenance Scale (6 – 30)
FAST – Functional assessment staging (0 – 16)
MMSE – Mini Mental State Examination (30 - 0)
ADAS-cog - Alzheimer's Disease Assessment Scale-cognitive subscale (0 – 70)

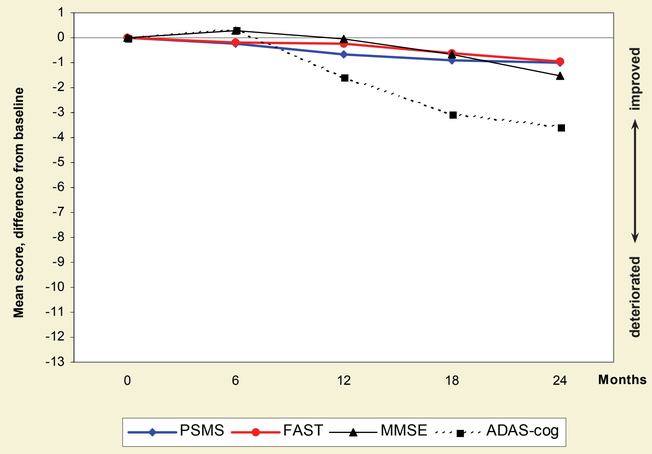
Reference List

[1] Green CR, Mohs RC, Schmeidler J, Aryan M, Davis KL. Functional decline in Alzheimer's disease: a longitudinal study. Journal of the American Geriatrics Society. 1993 Jun;41(6):654-61.

[2] Imbimbo BP, Verdelli G, Martelli P, Marchesini D. Two-year treatment of Alzheimer's disease with eptastigmine. The Eptastigmine Study Group. Dementia and geriatric cognitive disorders. 1999 Mar-Apr;10(2):139-47.

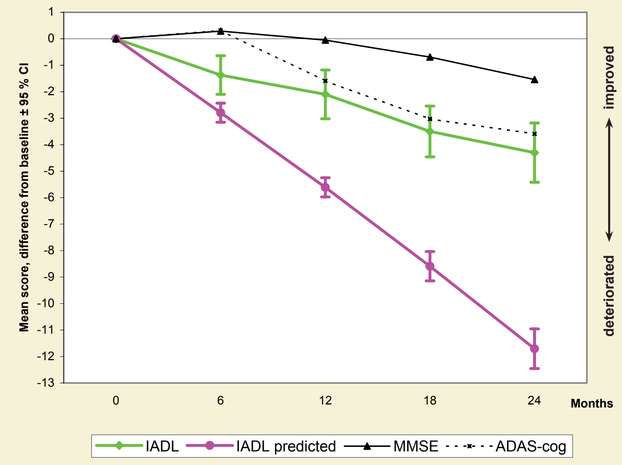
Results

Fig A PSMS and FAST



After two years of galantamine treatment the total mean change from baseline in PSMS score was 1,0 ± 2,4 points and in FAST 1,0 ± 1,7 points. Particularly the FAST mean change from baseline showed a linear relationship (0,000<p<0,05) with cognitive mean change and the strength of the relationship increased over time.

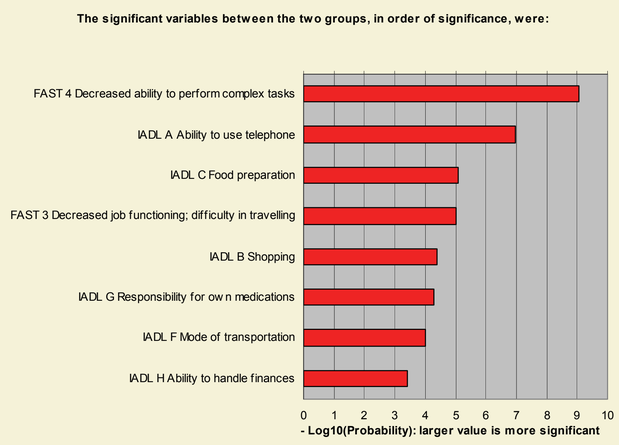
Fig B IADL



After two years of galantamine treatment the total mean change from baseline in IADL-score was 4,3 ± 4,9 (mean ± SD) points. Using the mathematical model by Green et al.[1] patients in this study are expected to decline approximately 11,7 ± 3,3 points on IADL score after 2 years. The IADL changes from baseline show a strong linear relationship (0,000<p<0,01) with cognition at the 18 and 24 months assessments.

110 patients with complete items in the three ADL scales at baseline were analysed in a two-step cluster analysis. Two clusters (groups) were identified (p<0,000).

Fig C



Other significant differences between the two groups

	Cluster 1, n=50	Cluster 2, n=60	
	Lower ADL function at baseline, see fig C	Higher ADL function at baseline, see fig C	P-value
MMSE at baseline*	20,8 ± 4,3	25,3 ± 3,0	p<0,000
ADAS-cog at baseline*	22,5 ± 8,6	12,6 ± 4,9	p<0,000
Percentage of apoE4-carriers	60 %	88 %	p<0,001
PSMS change between baseline and 12 months*	-1,0 ± 3,1	-0,3 ± 0,9	P<0,01
PSMS change between baseline and 18 months*	-1,4 ± 3,5	-0,5 ± 1,2	P<0,01
PSMS change between baseline and 24 months*	-1,6 ± 3,4	-0,5 ± 1,3	P<0,05

*mean ± SD

The patients in cluster 1 are more cognitive impaired at baseline than the other group and have lower percentage of apoE4-carriers. No significant differences in gender, duration, age at investigation or mean dose of galantamine during the study was observed. The cluster 1 patients also decline significantly faster in the long-term outcome of PSMS score compared to the other group; IADL and FAST scales do not show this difference.

Conclusions

The instrumental ADL scale in the galantamine treated patients showed a faster decline of function than the PSMS and FAST scales, but significantly less than expected by using the mathematical model by Green et al..

Increasing strength in the linear correlation between the three ADL scales as well as cognition was observed during the two years of the study.

Cluster analysis based on ADL scores at baseline, identified two subgroups: with different cognitive ability, dissimilar proportion of apoE4-carriers and rate of change in basic functional decline.

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