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WHEN IS ONUF'S NUCLEUS INVOLVED IN MULTIPLE SYSTEM ATROPHY?
A SPHINCTER ELECTROMYOGRAPHY STUDY

Aims of study
External anal sphincter (EAS)-electromyography (EMG) abnormalities can distinguish multiple system atrophy (MSA) from Parkinson's disease (PD) in the first 5 years after disease onset.[1] However, the prevalence of the abnormalities in the early stages of MSA has not previously been well known. Objective of the study is to present our EAS-EMG data in the various stages of MSA.

Study design, materials and methods
We recruited 84 patients with 'probable' MSA [2] (42 men, 42 women; mean age 62 years [47-78]; mean disease duration 3.2 years [0.5-8.0; 25% of patients < 1 year]; 50 MSA-C, 34 MSA-P). We performed an EAS-motor unit potential (MUP) analysis [3] and EMG-cystometry in all patients.

Results
The overall prevalence rate of neurogenic change of the EAS-MUP was 62% in our patients. Of these, the prevalence rate was 52% in the first year after disease onset, and the rate increased to 83% by the fifth year ($p<0.05$). It also increased with severities of gait disturbance ($p<0.05$), storage and voiding disorders, and detrusor-sphincter dyssynergia (not statistically significant). The neurogenic change was not correlated with gender, age; MSA-P/C; postural hypotension, constipation, erectile dysfunction in men; underactive or acontractile detrusor, or detrusor overactivity. In 17 incontinent patients without detrusor overactivity or low compliance, urinary incontinence was more severe in those with neurogenic change than in those without it ($p<0.05$).**[Fig. 1,2, Table 1]**

Interpretation of results and Concluding message
The results of the present study suggest that Onuf's nucleus involvement in MSA is time-dependent. Before the fifth year of illness, the prevalence rate of the neurogenic change does not seem to be high, so a negative result cannot exclude the diagnosis of MSA.

References
1. Sphincter EMG and differential diagnosis of multiple system atrophy. Mov Disord 2001; 16: 600-607.
2. Multiple system atrophy. Lancet Neurol 2004; 3: 93-103.
3. Sphincter electromyography in diagnosis of multiple system atrophy: technical issues. Muscle Nerve 2004; 29: 151-156.

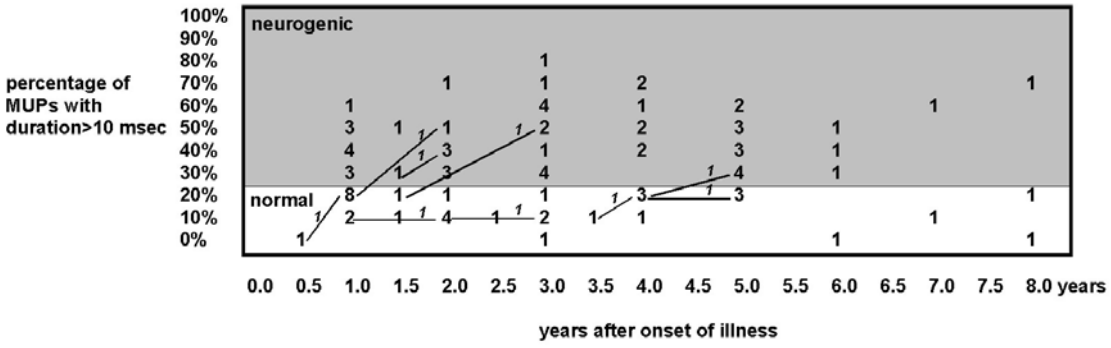

Figure 1 Percentage of MUPs with duration > 10 msec and duration of illness.

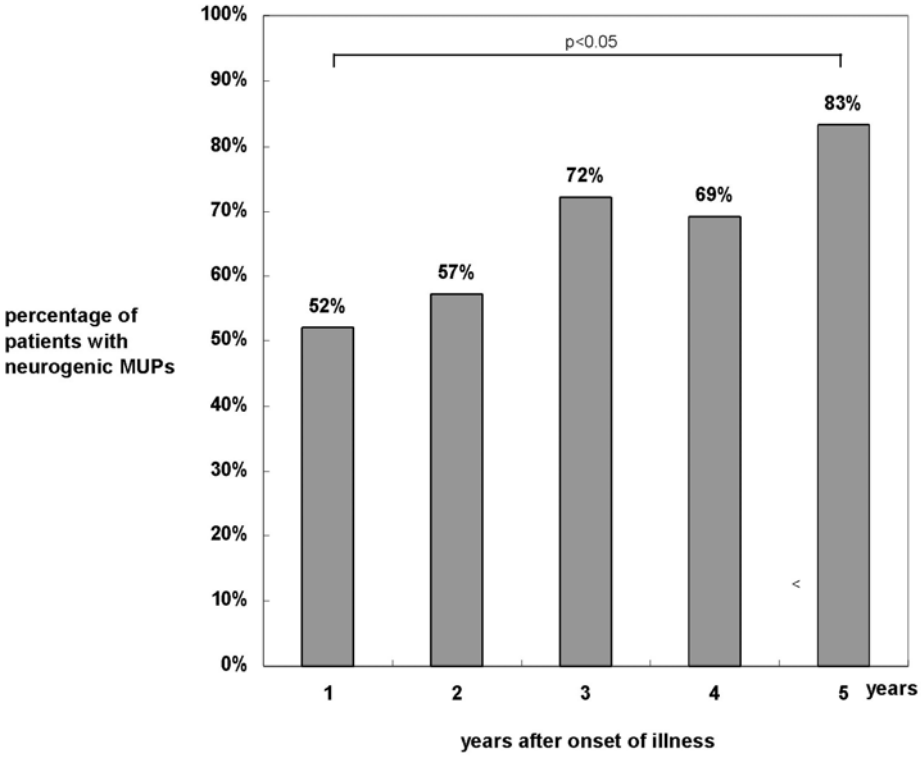

Figure 2 Neurogenic sphincter EMG and duration of illness.

	patients with neurogenic sphincter EMG			patients with neurogenic sphincter EMG		
	no.	%		no.	%	
male	27/42	65	female	25/42	59	NS
age<60 years	22/39	56	age>60 years	30/45	66	NS
MSA-C	29/50	58	MSA-P	23/34	68	NS
independent walk(1-3*)	11/23	48	wheelchair-bound(6-7*)	9/11	82	p<0.05
postural hypotension-	30/48	63	postural hypotension+	22/36	60	NS
constipation-	40/66	61	constipation+	12/18	67	NS
erectile dysfunction-	4/5	80	erectile dysfunction+	19/30	63	NS
continent	15/25	59	incontinent	37/59	63	NS
RU<200 ml	36/62	58	RU>200 ml	16/22	73	NS
detrusor overactivity-	14/26	55	detrusor overactivity+	38/58	65	NS
UD/AD-	29/52	56	UD/AD+	20/32	63	NS
DSD-	44/73	60	DSD+	8/11	73	NS

Table 1 Neurogenic sphincter EMG and clinical variables other than duration of illness.