

# **Hyponatremia upon presentation to the emergency department – the need for urgent neuroimaging studies**

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**Supplementary Table S1. Predictors for pathological neuroimaging findings by logistic regression analysis**

	<i>Univariate</i>	
	<b>OR (95% CI)</b>	<b>P-value</b>
Plasma sodium level	1.14 (0.97 – 1.35)	0.105
Gender (female)	0.83 (0.26 – 2.64)	0.749
Age	0.92 (0.66 - 1.28)	0.922
Neurological symptoms		
Weakness/Confusion	0.80 (0.28 – 2.30)	0.681
Nausea/Vomiting	1.31 (0.32 – 5.30)	0.709
Headache	0.00	0.999
Vertigo	0.52 (0.11 – 2.49)	0.411
Seizures	0.00	0.999
Reduced state of consciousness	0.98 (0.25 – 3.87)	0.977
Focal neurological signs*		

Odds ratios (OR), 95% confidence intervals (CI), and p-values were calculated by logistic regression analysis (backward elimination). Variables were selected *a priori* based on theoretical considerations and existing literature. Those statistically significant at the 10% level in the univariate analysis were included in the multivariate model; two-sided *p* values <0.05 were considered statistically significant in the multivariate model.

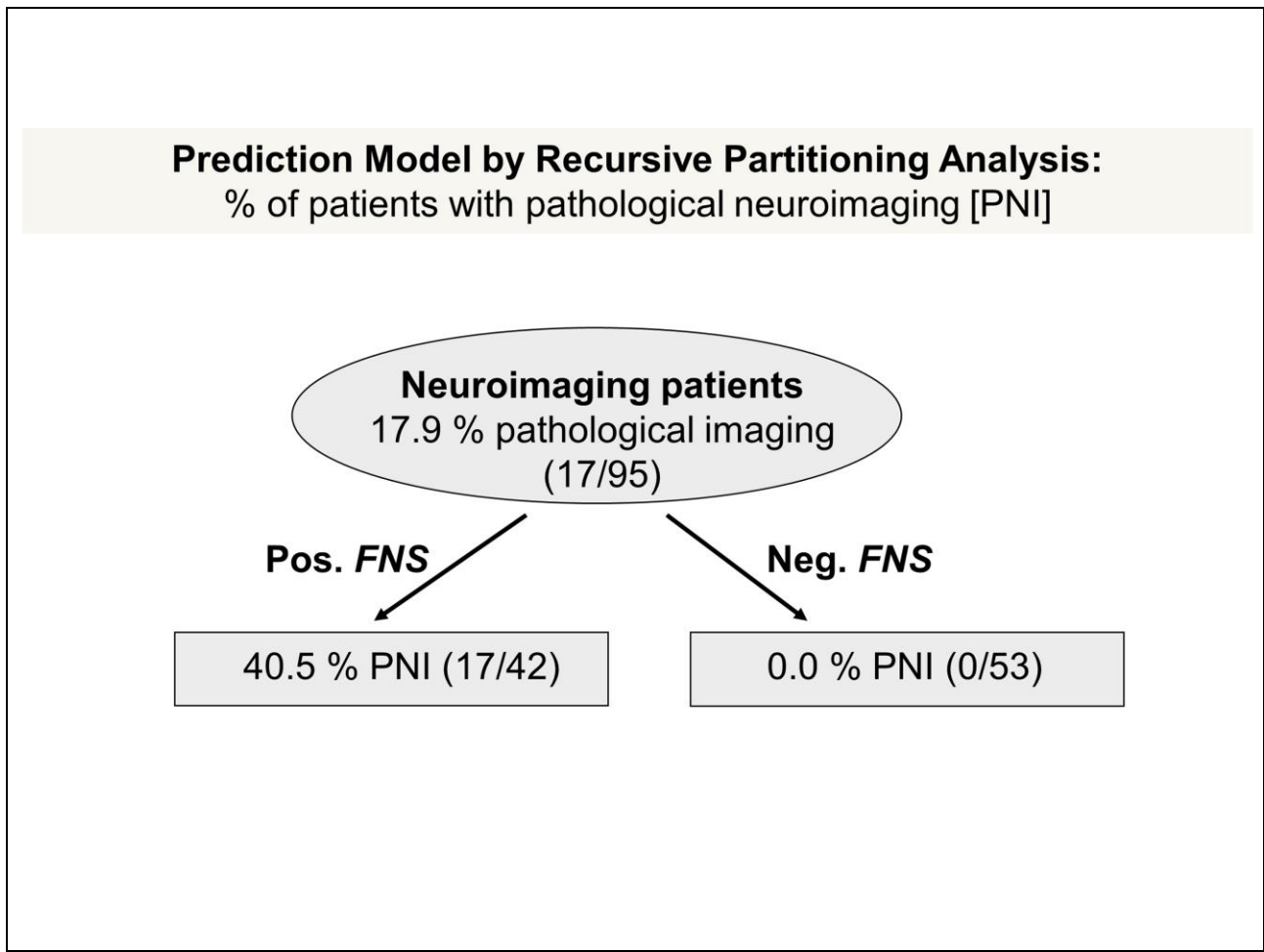
\* All patients with neuroimaging pathology had *focal neurological signs (FNS)*; it was therefore statistically impossible to calculate these OR and p-values for *FNS* by logistic regression analysis.

**Supplementary Table S2: All cases of patients with neuroimaging pathology related to acute symptomatology.**

No. of pat.	Sex	Age	Serum-Na in mmol/l	Symptomatology	Imaging findings	Diagnosis	Etiology of hyponatremia (for all association with cerebral process possible [e.g. SIAD])
1	M	55	124	<u>FNS</u> – unilateral arm paralysis	Ischemic media infarction	Ischemic media stroke	Diuretics
2	F	32	123	<u>FNS</u> – brachiofaziale hemiparalysis	Encephalitis, multiple embolic infarctions	Endocarditis with septic encephalitis	Hypovolemia
3	F	78	120	<u>FNS</u> – unilateral gaze paralysis, pos. pyramidal sign; reduced state of vigilance	Encephalitis	Herpesencephalitis	Diuretics
4	F	41	123	<u>FNS</u> – leg paralysis	Tumor	Malig. melanoma with cerebral metastases	/
5	F	78	120	<u>FNS</u> – aphasia; nausea/vomiting; vertigo/falls	Ischemic media infarction	Ischemic media stroke	Hypervolemia
6	F	85	115	<u>FNS</u> – gait ataxia; weakness/confusion; nausea/vomiting; vertigo/falls	Intracranial hemorrhage	Intracranial hemorrhage caused by head injury	Diuretics
7	F	82	121	<u>FNS</u> – hemiparalysis, aphasia	Ischemic media infarction	Ischemic media stroke	/
8	M	61	123	<u>FNS</u> – unilateral gaze evoked nystagmus; nausea/vomiting	Tumor	Bronchial-CA with cerebral metastases	/
9	M	86	121	<u>FNS</u> – hemiparalysis, dysarthria	Tumor	Mamma-CA with cerebral metastases	/
10	F	90	124	<u>FNS</u> – aphasia	Tumor	Primary cerebral tumor	Neuroleptic drug
11	M	79	120	<u>FNS</u> – hemiparalysis; weakness/confusion	Intracranial hemorrhage and epidural bleeding	Intracranial hemorrhage and epidural bleeding	Neuroleptic drug
12	M	58	118	<u>FNS</u> – diploic images; weakness/confusion	Tumor of maxillary sinus with orbital infiltration	CA of maxillary sinus with orbital infiltration	/
13	F	43	115	<u>FNS</u> – anisocoria; reduced state of vigilance	Intracranial hemorrhage	Intracranial hemorrhage	/
14	F	79	123	<u>FNS</u> – hemihypoesthesia, aphasia	Ischemic media infarction	Ischemic media stroke	/
15	F	66	124	<u>FNS</u> – aphasia, weakened tendon reflexes of legs; reduced state of vigilance	Subdural hematoma	Subdural hematoma	Diuretics, hypovolemia
16	F	65	117	<u>FNS</u> – clearly reduced unilateral arm reflex; neck pain; weakness/confusion	Cervical spondylodiscitis	Cervical spondylodiscitis	Hypovolemia
17	F	56	123	<u>FNS</u> – unilateral hearing loss; weakness/confusion	Meningitis, mastoiditis; tumor in sella turcica	Meningitis following mastoiditis	Addison disease

Generally in patients with cerebral processes, hyponatremia might be caused by SIAD (*syndrome of inappropriate antidiuresis*), *adrenocorticotrophic hormone* (ACTH) deficiency and *cerebral salt wasting*. Therefore only additional possible causes for hyponatremia are enlisted in “Etiology of hyponatremia

**Supplementary Figure S1: Prediction model by recursive partitioning analysis.**



Two split variables. Percent of patients with neuroimaging pathology. *FNS*—*focal neurological signs*.