

Dopaminergic Symptoms In Migraine: A Case Series On 446 Consecutive Patients

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Background

Dopamine (DA) is considered to play a major role in migraine pathogenesis as suggested by clinical, genetic, and pharmacological evidence (figure).

Aim

To assess frequency and characteristics of DAergic presynaptic (yawning, somnolence, neck discomfort/stiffness) and post-synaptic (intense nausea, vomiting) symptoms in migraineurs during the different attack phases (prodromes, headache stage, postdromes), and to investigate whether migraineurs with DAergic symptoms (DA+) represent a distinct migraine clinical phenotype.

Methods

We evaluated 446 patients (F/M: 348/98) affected by migraine without aura (n=269), migraine with aura (n=35), chronic migraine (n=142) consecutively seen at our Headache and Pain Unit from 1/7 to 31/12 2016 with face-to face interviews using a semi-structured questionnaire addressing three main issues: 1) life-style, behavioral and socio-demographic factors 2) comorbidities and concomitant medications; and 3) clinical migraine features.

The presence of DAergic symptoms was determined by asking the following question: “During prodromes, headache stage or postdromes do you also have at least one of the following symptoms: yawning, somnolence, neck discomfort/stiffness, severe nausea or vomiting?”.

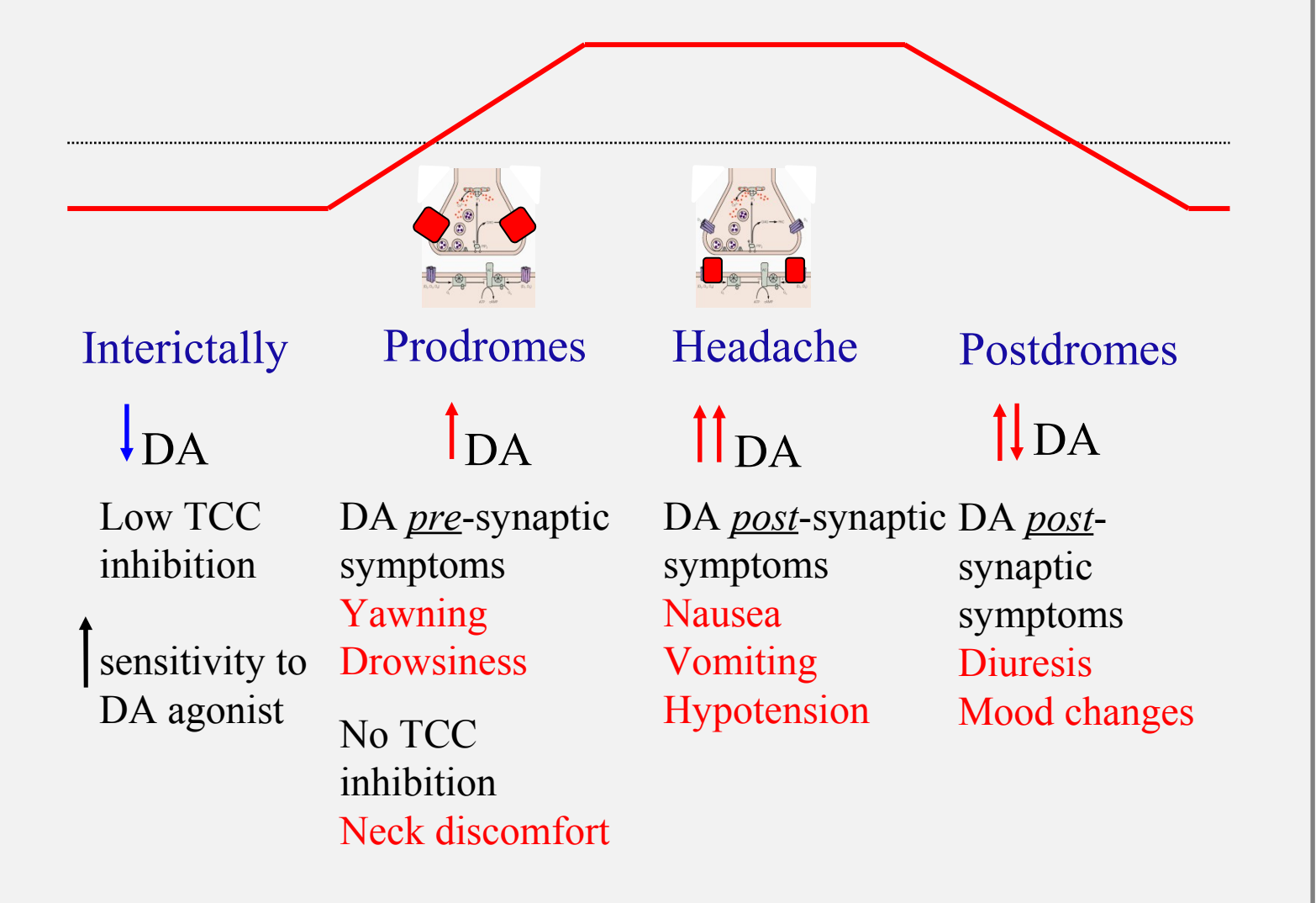
Results

- 36.5% of the patients reported DAergic symptoms which occurred during prodromes in 14.7% of cases, headache stage in 74.3% and postdromes in 11%;
- The most frequent DAergic symptoms were yawning (57.7%), somnolence (48.4%), severe nausea (43.6%), neck discomfort/stiffness (35.6%), vomiting (24.5%);
- 27% of DA+ reported 1 DAergic symptom, 12.9% referred 2 symptoms and 60.1% referred ≥ 3 symptoms;
- 42.9% of DA+ revealed both pre- and post-synaptic DAergic symptoms

Tab. 3: Stepwise logistic regression analysis of independent determinant of pre-synaptic or postsynaptic DAergic symptoms in migraineurs

Variable	Pre-synaptic			Post-synaptic		
	OR	95% CL	P	OR	95% CL	P
Attack duration	1.19	1.07–1.34	0.0023	1.41	1.21–1.63	<0.0001
Osmophobia	1.72	1.26–2.33	0.0006	1.49	1.02–2.17	0.0404
Vomiting	1.62	1.23–2.14	0.0006	2.73	1.90–3.93	<0.0001
Allodynia	1.49	1.14–1.95	0.0040		Out	
Prophylaxis	0.73	0.55–0.97	0.0308		Out	
Nausea		Out		7.88	2.84–21.9	0.0001
DAergic drugs		Out		1.39	1.08–1.81	0.0122
Aura		Out			Out	
Physical activity		Out			Out	
Analgesic overuse		Out			Out	
Gender		Out			Out	
Cranial parasympathetic symptoms		Out			Out	

Figure: Fluctuation of DAergic activity during the migraine attack



Tab. 1: Clinical differences between migraine patients with or without DAergic symptoms

Migraine feature	P
Attack duration (hrs)	<0.0001
Cranial parasympathetic symptoms	0.0014
Allodynia	0.0002
Severe nausea	0.0006
Osmophobia	<0.0001
Vomiting	<0.0001
Profuse vomiting	<0.0001
Somnolence	<0.0001
Yawning	<0.0001
Neck stiffness	<0.0001

Tab. 2: Stepwise logistic regression analysis of independent determinant of DAergic symptoms in migraineurs

Variable	OR	95% CL	P
Attack duration	1.24	1.11–1.38	0.0001
Allodynia	1.44	1.11–1.87	0.0055
Osmophobia	1.76	1.31–2.38	0.0002
Vomiting	2.02	1.55–2.64	<0.0001
Prophylaxis		Out	
Severe nausea		Out	
DAergic drugs		Out	
Aura		Out	
Physical activity		Out	
Analgesic overuse		Out	
Gender		Out	
Cranial parasympathetic symptoms		Out	

Conclusions

- 1/3 or migraineurs refers DAergic symptoms (usually ≥ 3) during the attack;
- DAergic symptoms are usually presynaptic (yawning and somnolence) and occur mainly during the headache stage.
- Migraine attacks are longer and more frequently associated with osmophobia, allodynia and vomiting in DA+ than in general migraine population.
- DA+ seem to be characterized by a more evident involvement of hypothalamus and thalamus during the attack and could represent a distinct migraine endophenotype.