Error monitoring in OCD patients

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Introduction

Neuroimaging studies show increased fronto-striatal activation in patients with obsessive-compulsive disorder (OCD). Overactive error monitoring might cause OCD symptoms.

ERP studies:

- larger ERN ampitudes in 4 studies (correlation with symptom servity)
- larger CRN ampitudes in one study (subclinical group)
- Nieuwenhaus et al. (2005): no group differences

Questions:

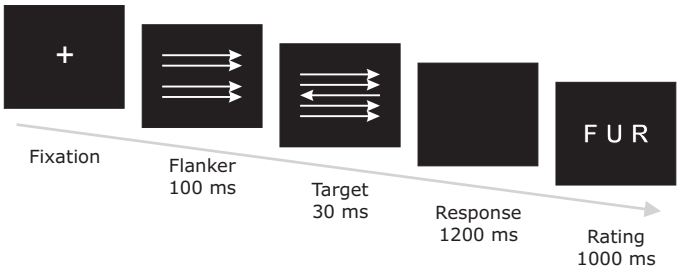
- Frontocentral overactivty specific to errors? ERN
- ... or general overactivation in performance monitoring? ERN & CRN
- Differences in error correction - group differences for the correction related negativity (CoRN)?

Methods

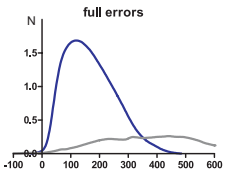
- Participants: 18 patients with OCD and 18 healthy control participants.

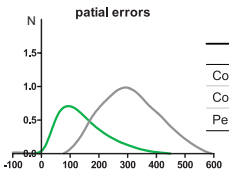
	Patients (n = 18)	Controls (n = 18)
Age (years)	35.2 (8.7)	31.1 (8.0)
Sex (female/male)	8/10	9/9
Verbal IQ (WST)	105.9 (10.7)	108.1 (8.1)
Medication	7 (SSRI, SNRI)	-
BDI ***	17.9 (10.7)	1.8 (1.7)
Padua ***	35.5 (10.7)	6.6 (4.6)
Y-Bocs	23.5 (8.3)	

- Task: arrowhead version of the flanker task (Kopp et al. 1999) with speed instruction.



- Response recording: force sensitive buttons (continuous recording) and offline analysis of response force (full errors > 1.0 N)





	full errors	partial errors
Corr (%)	25.5	80.5
Corr RT (ms)	164	150
Perceived (%)	83,5	22,5

- EEG

Data recording: 62 channels referenced to Cz, sampling rate 200 Hz, filters: 0.01 - 100 Hz.

Data analysis: average reference, eye movement artefact correction and segmentation according to accuracy and response force.

Statistics:

ERN & CRN: negative peak (50 - 150 ms) minus positive peak (-50 - 50 ms)

CoRN: mean amplitude 250 - 350 ms

Pe: mean amplitude 200 - 400 ms

Results

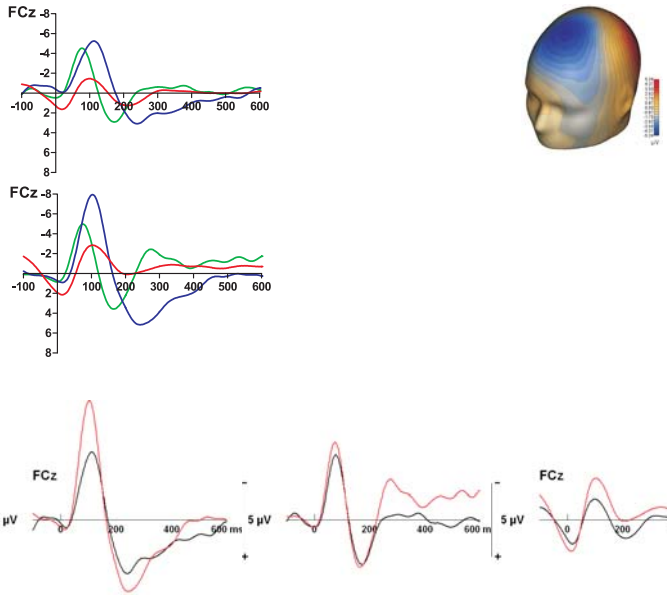
Behavioural Data:

- errors: no group difference in error rate and reaction time
- correct: slower reaction times in OCD patients ($p<0.05$)
- post error slowing: significant post error slowing for full errors ($p<0.01$), but not for partial errors (n.s.)

	full errors *uncorrected*		partial errors *corrected*		correct	
	CON	OCD	CON	OCD	CON	OCD
Trials (%)	5.3	4.0	5.0	4.1	89.7	91.9
RT (ms)	246	262	240	254	336	360
Post RT (ms)	343	370	334	353	336	359

ERP Data:

- errors vs. Correct: ERN > CRN
- partial vs. full errors: no difference in ERN, earlier ERN for partial errors and CoRN for partials errors



Discussion and Conclusion

References

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