



Volumetric changes in amygdala and hippocampus after three months paroxetine treatment for Major Depressive Disorder

H.G. Ruhe^{1,2*}, E. Miedema²,
J. Booi³, M.W.A. Caan⁴,
D.J. Veltman⁵,
A.H. Schene²

¹ Program for Mood and Anxiety Disorders, University Center for Psychiatry, Groningen, The Netherlands
² Program for Mood Disorders, Dept. of Psychiatry, Academic Medical Center, Amsterdam, The Netherlands
³ Dept. of Nuclear Medicine, Academic Medical Center, Amsterdam, The Netherlands
⁴ Dept. of Radiology, Academic Medical Center, Amsterdam, The Netherlands
⁵ Dept. of Psychiatry, VU Medical Center, Amsterdam, The Netherlands
* Correspondence e-mail: H.G.Ruhe@UMCG.NL

BACKGROUND

- Amygdala and hippocampal volumes are reduced in major depressive disorder (MDD)^{1,2}
- Cross-sectional studies of amygdala-volumes show that antidepressant-use increases these volumes¹, but this is unclear for the hippocampus²
- The cross-sectional nature of these studies precludes causal conclusions, which needs longitudinal investigation

CONCLUSIONS

- In drug-free MDD-patients, amygdala and hippocampus volumes increase by 12 weeks of paroxetine
- Mechanism: paroxetine-induced growth of neurons or glia-cells³
- In volumetric sMRI patients vs. controls comparisons should account for antidepressant use.

AIM

Quantify volumetric changes of amygdala and hippocampus after 12 weeks of paroxetine-treatment in MDD-patients

METHODS

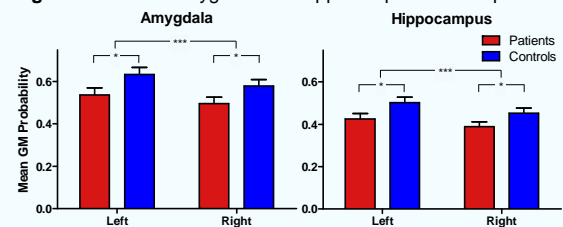
- 22 drug free MDD-patients (25-55 yrs, HDRS₁₇-score >18; 64% drug-naive)
- 22 gender and age matched controls
- 3T structural MRI-scans
- Treatment with paroxetine (20-50mg/d)
- Repeated scans at 6 and 12 wks (n=19)
- Segmentation and DARTEL in SPM8
- Volumes extracted by MarsBar-tool
- Mixed models for confounders (age, illness-duration, severity, anxiety) and interactions (side)

	MDD	Controls
Age (yrs)	43.5 ±7.94	44.0 ±7.92
Male (%)	14 (63.6%)	14 (66.7%)
Recurrent MDD (%)	10 (45.5%)	NA
Age 1 st episode	36.7 ±10.17	
Duration since 1 st episode	5.0 (IQR 1.44- 5.57)	

RESULTS

- MDD-patients mean HDRS 23.1 ±3.6

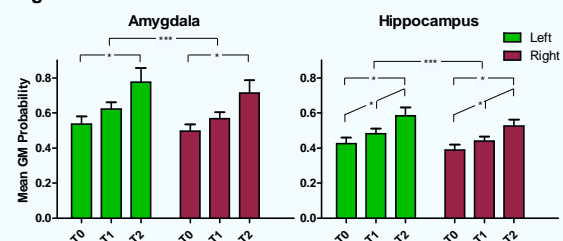
Figure 1. Smaller amygdala and hippocampus in MDD-patients



* p<0.05; *** p<0.001. No confounders (p>0.5).

- Lin. increase over time for hippocampus (p=0.04); not amygdala (p=0.07)
- Changes independent of paroxetine serum concentration

Figure 2. Increase in volume over time.



* p<0.05; *** p<0.001.

1. Hamilton et al. *Mol Psychiatry* 2008;13:993-1000.
2. McKinnon et al. *J Psychiatry Neurosci* 2009;34:41-54.
3. Bernier et al. *Proc Natl Acad Sci USA* 2002;99:11464-9.