Soluble beta amyloid and behavioral despair: effects of several classes of antidepressants in rats

M.G. Morgese[1], S. Schiavone[1], P. Tucci[1], M. Bove[2], E. Mhillaj[2], L. Trabace[1], V. Cuomo[2]

[1]Dept. of Clinical ad Experimental Medicine, University of Foggia
[2]Dept. of Physiology and Pharmacology 'V. Erspamer', 'Sapienza' University of Rome

Mounting evidence suggests that depression may represent a risk factor and an early manifestation of AD before the occurence of cognitive impairments (Geerlings et al., 2000). Neuropsychiatric symptoms are not just an emotional reaction to the awareness of the dementing diseases, but may derive from neurobiological changes in specific brain areas and may be considered prodromal of dementia (Andersen et al., 2005). In this regard, we have previously reported the depressive–like behavior induced by a single intracerebroventricular injection of soluble amyloid beta protein (sAbeta) in rats. Such effect was quantified by measuring the immobility time in the forced swimming test (FST) and was accompanied by reduced serotonin (5-HT) levels, brain derived neurotrophic factor and nerve growth factor protein and mRNA content in prefrontal cortex (PFC) (Colaianna et al., 2010). Thus, the aim of the present work was to verify the effect of different classes of antidepressants on the immobility time in sAbeta-treated rats. Cortical levels of 5-HT and noradrenaline (NA) were also quantified. We found that fluoxetine, reboxetine, and imipramine significantly reduced the immobility time in sAbeta-treated rats compared to controls. In addition, fluoxetine and reboxetine reversed the reduction of 5-HT levels in PFC, while imipramine had no effect. Moreover, in the same animal model we have previously reported that sAbeta increased the cortical levels of NA (Morgese et al., 2014). Here, we found that fluoxetine and reboxetine further increased NA content.
In conclusion, in the present work we demonstrated that the antidepressant compounds used effectively reversed the depressive-like behavior and neurochemical alterations induced by s-Abeta.

Sun et al. (2008). *Arch Gen Psychiatry.* 65: 542–550.
Geerlings et al. (2000). *Br J Psychiatry.* 176: 568–575
Andersen et al. (2005). *Epidemiology.* 16: 233–238.
Colaianna et al. (2010). *Br J Pharmacol.* Apr;159(8):1704-15.
Morgese et al. (2014). *Curr Pharm Des*. 20(15):2539-46.