Investigating the roles of different monoamine transmitters and impulse control using the 5-choice serial reaction time task.

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Previous studies have shown that drugs which block the reuptake of catecholamine neurotransmitters improve impulse control in diseases such as attention deficit hyperactivity disorder (ADHD). Serotonin-specific reuptake inhibitors (SSRI) lack efficacy in ADHD and have been linked to increased suicide risk. The present study investigated drugs with affinity for one or more of the monoamine reuptake transporters using the 5-choice serial reaction time task, a model of attention and impulsivity in rodents. We also tested the effects of the alpha(2)-adreoceptor antagonist, idazoxan and novel antidepressant, agomelatine, which both increase cortical noradrenaline concentrations through non-reuptake mechanisms. Improvements in impulse control were observed with venlafaxine, a serotonin and noradrenaline re-uptake inhibitor (SNRI) but not bupropion (dopamine and noradrenaline re-uptake inhibitor). Sibutramine (SNRI) reduced premature responses by ~50% at the highest dose tested but this was not significant. All three of the SSRIs tested reduced premature responding in a dose-dependent manner, although also slowed response and collection latencies. Neither idazoxan nor agomelatine significantly reduced premature responding, suggesting a lack of efficacy at the doses tested. None of the drugs tested improved attention in this task but sibutramine (SNRI), fluoxetine (SSRI) and paroxetine (SSRI) all increased omissions at the highest dose tested. These data suggest that the SNRIs and SSRIs reduce premature responding but tend to be less specific than noradrenaline specific reuptake inhibitors in this model. SSRIs did not induce any specific impairment in impulse control in this model.