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Novel Psychoactive Substance (NPS): Effects of the 5-IT and D2PM on the Dopamine System and 5-HTA, 5-HTC receptors site

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The use of Novel Psychoactive Substances (NPS) has grown rapidly in recent years. NPS, formerly known as “legal highs” are man-made substances which are used like the illegal drugs. 5-(2-Aminopropyl)indole is an indole and phenethylamine derivative with empathogenic effects. Diphenylprolinol (D2PM) is another novel stimulant psychoactive drug, which is an inhibitor of norepinephrine-dopamine reuptake. Their effects can be powerful and they have long lasting psychostimulant properties. The aim of study was to investigate the potential addictive and hallucinogenic properties of two novel psychoactive substances 5-IT and D2PM, through testing their effects at the dopamine transporter (DAT) and on serotone 5HTA and 5HTC receptors site in rat brain in vitro. Cocaine was used as reference substance in considering DAT effects. It was hypothesised that 5-IT, D2PM and cocaine would compete with [¹²⁵I] RTI-121 at DAT in a concentrations-dependent manner and with [¹²⁵I]-DOI at 5-HT_A, C systems which may trigger its effect of putative stimulant and hallucinogenic. Quantitative Autoradiography was employed and results revealed that there are concentration-dependent effects of 5-IT, D2PM and Cocaine on the intensity of iodine-125 signal in brain tissue while competed with [¹²⁵I] RTI121. Whereas both 5-IT and D2PM showed that no significant effects at 5-HT_A and 5-HT_C receptors while competed with [¹²⁵I] DOI. The present study established that 5-IT and D2PM are both more effective and potent than cocaine in stimulating dopamine release. These data suggests that 5-IT and D2PM are dopaminergic rather than serotonergic. Therefore, 5-IT and D2PM may pose significant adverse effects in human users.

Biography

Zia Uddin Ahmed recently graduated from the University of Roehampton with a merit in MSc Clinical Neuroscience. Zia is working as a private tutor at a weekend education service since 2012, tutoring Key stages 3, 4, Btec and A-level pupils. He is currently looking for Research Assistant position. His ambition to become a neuroscientist as he believes neuroscientist is a noble profession, and not one to be taken lightly.

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