dopamine mechanisms in the extrapyramidal system can influence dopamine metabolism in an anatomically distinct area of the mesolimbic system. Secondly, that appreciable changes in HVA levels are not necessarily accompanied by functional changes characteristic of dopamine receptor stimulation or blockade. These two factors should be considered in interpreting the significance of changes in mesolimbic and extrapyramidal HVA levels after peripheral neuroleptic treatment.

References

COSTALL, B. & NAYLOR, R.J. (1976). Antagonism of the hyperactivity induced by dopamine applied intracerebrally to the nucleus accumbens septi by typical neuroleptics and by clozapine, sulpiride and thioridazine. *Eur. J. Pharmac.*, **35**, 161–168.

DE GROOT, J. (1959). The rat brain in stereotaxic coordinates. *Verh. K. Ned. Akad. Wet.*, **59**, 14–40.

WALDMEIER, P.C. & MAÎTRE, L. (1976). On the relevance of preferential increases in mesolimbic versus striatal dopamine turnover for the production of antipsychotic activity of psychotropic drugs. *J. Neurochem.*, **27**, 589–597.

WESTERINK, B.H.C., LEJEUNE, B., KORF, J. & VAN PRAAG, H.M. (1977). On the significance of regional dopamine metabolism in the rat brain for the classification of centrally acting drugs. *Eur. J. Pharmac.*, **42**, 179–190.

A comparison of the effects of GABA and glycine on the release of [^{3}H]-dopamine from rat striatal slices

R.W. KERWIN & C.J. PYCOCK

Department of Pharmacology, The Medical School, University of Bristol, Bristol BS8 1TD

Both γ-aminobutyric acid (GABA) (Giourgueff, Kemel, Glowinski & Besson, 1978) and glycine (Anderson & Roberts, 1978) can stimulate the efflux of [^{3}H]-dopamine ([^{3}H]-DA) from rat striatal slices. We have therefore decided to compare the effects of these two amino acids on the efflux of [^{3}H]-DA, [^{3}H]-5-hydroxytryptamine ([^{3}H]-5HT) and [^{3}H]-GABA from rat striatal slices in an attempt to determine whether or not GABA and glycine act at the same receptor site in the striatum. The methods used to study the release of preloaded radio-labelled transmitter from superfused brain slices *in vitro* have been described in detail elsewhere (Kerwin & Pycock, 1978). Aminooxyacetic acid (10 μM) or pargyline (50 μM) were present to inhibit labelled transmitter metabolism where appropriate.

A depolarizing stimulus (50 mM KCl) stimulated the rate of efflux of [^{3}H]-5HT, [^{3}H]-DA and [^{3}H]-GABA from striatal slices. In all cases the effect of K^+ was markedly reduced in a low calcium, magnesium-substituted medium. Glycine (200–400 μM) and Gaba (50–200 μM) caused an increase in the rate of basal efflux of [^{3}H]-DA. Neither GABA nor glycine at 1mM had any effect on the efflux of [^{3}H]-5HT or [^{3}H]-GABA. At 200 μM both GABA and glycine potentiated the ability of 20 mM K^+ to stimulate [^{3}H]-DA efflux. Picrotoxin (50 μM) prevented GABA (400 μM) from stimulating the efflux of [^{3}H]-DA, whereas glycine's ability to stimulate [^{3}H]-DA release was unaffected. On the other hand strychnine hydrochloride (0.5 μM) prevented the effects of both GABA and glycine.

The ability of a low dose of strychnine to block the effects of GABA may suggest that GABA evoked [^{3}H]-DA release, may, in part, be mediated through receptors for glycine or other neutral amino acids. In addition this may rationalize the observation that the specific GABA agonist 3-aminopropane sulphonic acid is ineffective at stimulating [^{3}H]-DA release from striatal slices (Starr, 1978), although in our study we have shown that muscimol (100 μM) can stimulate [^{3}H]-DA efflux in a manner which is partially sensitive to picrotoxin (50 μM).

In additional studies using [^{3}H]-glycine, 50 mM K^+ effectively stimulated the efflux of radioactivity from neonatal rat spinal cord and striatal slices. In both cases this effect was calcium dependent, suggesting a possible neurotransmitter status for glycine.

R.W.K. is an MRC student.

We are grateful to Professor W. Koella for the generous supply of muscimol.

References

ANDERSON, S.D. & ROBERTS, P.J. (1978). Amino acid stimulation of [^{3}H]-dopamine release from rat striatum *in vitro*. *Br. J. Pharmac.* (in press).

GIOURGUEFF, M.F., KEMEL, M.L., GLOWINSKI, J. & BESSON, M.J. (1978). Stimulation of dopamine release by GABA in rat striatal slices. *Brain Res.*, **139**, 115–130.

KERWIN, R. & PYCOCK, C. (1978). Baclofen (β-p-chlorophenyl-γ-aminobutyric acid) enhances [^{3}H]-γ-aminobutyric acid ([^{3}H]GABA) release from rat globus pallidus *in vitro*. *J. Pharm. Pharmac.*, **30**, 622–627.

STARR, M.S. (1978). Influence of GABA on dopamine release from brain slices. *Proceedings of the 7th International congress of Pharmacology:* Pergamon Press.