



Schizophrenia: neurochemicals

This activity will help you to...

- Explain the dopamine hypothesis of schizophrenia
- Understand evidence relevant to this hypothesis
- Comment on psychological evidence
- Evaluate biological explanations of schizophrenia

One popular hypothesis about the causes of schizophrenia is that it is caused by abnormally high activity in brain systems that use dopamine (DA) as their primary neurotransmitter. Below is an outline of some evidence relevant to the dopamine hypothesis. Use a selection of this evidence in order to write a commentary in which you evaluate this view. In your commentary...

- **You must** comment on how the evidence you use supports or challenges the DA hypothesis.
- **You should** comment on evidence both for and against the hypothesis.
- **You could** use your own skills and knowledge to make additional critical and evaluative points.

The Evidence

Wise & Stein (1973) found that schizophrenia patients who died in accidents showed abnormally low levels of **Dopamine Beta Hydroxylase** (DBH) in the brain fluid. DBH is an enzyme whose function is to break down the neurotransmitter Dopamine after release.

Schizophrenia is usually treated with **chlorpromazine**. Chlorpromazine is a drug that binds to dopamine (DA) receptors without stimulating them, rendering them unavailable for activation by DA. **Barlow & Durand (1995)** report that chlorpromazine is effective in reducing schizophrenic symptoms in about 60% of cases. It appears to have the most impact on the positive symptoms (hallucinations, delusions) and treated patients may still suffer from severe negative symptoms.

Timmons and Hamilton (1990) report that high doses of **amphetamine** (a drug that stimulates DA activity) can result in an acute psychosis resembling schizophrenia in clinically normal people. This **amphetamine psychosis** can be treated with chlorpromazine.

Janowski et al (1972) compared the responses to amphetamine of schizophrenia patients and normal controls given identical doses. Low doses of amphetamine that produced slight increases in psychomotor agitation amongst normal controls resulted in a substantial exacerbation of symptoms amongst schizophrenia patients.

Parkinson's disease is a movement disorder that affects 1-2% of the population, usually in later life. It is caused when parts of the brain that rely on DA to control movement atrophy and die off. It can be treated with drugs that increase DA activity. All other things being equal, we would expect about 1-2% of schizophrenia patients to suffer from Parkinson's disease. However, such patients are actually extremely rare (Timmons & Hamilton, 1990).