The biological approach to explaining OCD

Genetic explanations

Some mental disorders appear to have a stronger biological component than others, and **OCD** is a good example of a condition that may be largely understood as biological in nature. One form of biological explanation is the **genetic explanation**.

Genes are involved in individual vulnerability to OCD. Lewis (1936) observed that of his OCD patients 37% had parents with OCD and 21% had siblings with OCD. This suggests that OCD runs in families, although what is probably passed on from one generation to the next is genetic *vulnerability* not the certainty of OCD.

According to the **diathesis-stress model** certain genes leave some people more *likely* to suffer a mental disorder but it is not certain – some environmental stress (experience) is necessary to trigger the condition.

Candidate genes

Researchers have identi ed genes, which create vulnerability for OCD, called *candidate genes*. Some of these genes are involved in regulating the development of the **serotonin** system. For example, the gene 5HT1-D beta is implicated in the ef ciency of transport of serotonin across **synapses**.

OCD is polygenic

However, like many conditions, OCD seems to be **polygenic**. This means that OCD is not caused by one single gene but that several genes are involved.

Taylor (2013) has analysed ndings of previous studies and found evidence that up to 230 different genes may be involved in OCD. Genes that have been studied in relation to OCD include those associated with the action of **dopamine** as well as **serotonin**, both **neurotransmitters** believed to have a role in regulating mood.

Different types of OCD

One group of genes may cause OCD in one person but a different group of genes may cause the disorder in another person. The term used to describe this is *aetiologically heterogeneous*, meaning that the origin (aetiology) of OCD has different causes (heterogeneous).

There is also some evidence to suggest that different types of OCD may be the result of particular genetic variations, such as hoarding disorder and religious obsession.

Neural explanations

The genes associated with OCD are likely to affect the levels of key neurotransmitters

as well as structures of the brain. These are **neural explanations**.

The role of serotonin

One explanation for OCD concerns the role of the neurotransmitter serotonin, which is believed to help regulate mood. Neurotransmitters are responsible for relaying information from one **neuron** to another. If a person has low levels of serotonin then normal transmission of mood-relevant information does not take place and mood –and sometimes other mental processes – are affected. At least some cases of OCD may be explained by a reduction in the functioning of the serotonin system in the brain.

Decision-making systems

Some cases of OCD, and in particular hoarding disorder, seem to be associated with impaired decision making. This in turn may be associated with abnormal functioning of the lateral (side bits) of the **frontal lobes** of the brain. The frontal lobes are the front part of the brain (behind your forehead) that are responsible for logical thinking and making decisions.

There is also evidence to suggest that an area called the left **parahippocampal gyrus**, associated with processing unpleasant emotions,functions abnormally in OCD.

The biological approach to treating OCD

Drug therapy

Drug therapy for mental disorders aims to increase or decrease levels of **neurotransmitters** in the brain or to increase/decrease their activity. On the previous spread we saw that low levels of **serotonin** are associated with OCD. Therefore drugs work in various ways to increase the level of serotonin in the brain.

SSRIs

The standard medical treatment used to tackle the symptoms of OCD involves a particular type of **antidepressant** drug called a **selective serotonin reuptake inhibitor** (or **SSRI** for short). SSRIs work on the serotonin system in the brain.

Serotonin is released by certain **neurons** in the brain. It is released by the **presynaptic neurons** and travels across a **synapse** (see diagram on the left). The neurotransmitter chemically conveys the signal from the presynaptic neuron to the **postsynaptic neuron** and then it is reabsorbed by the presynaptic neuron where it is broken down and re-used.

By preventing the re-absorption and breakdown of serotonin SSRIs effectively increase its

levels in the synapse and thus continue to stimulate the postsynaptic neuron. This compensates for whatever is wrong with the serotonin system in OCD.

Dosage and other advice vary according to which SSRI is prescribed. A typical daily dose of Fluoxetine is 20mg although this may be increased if it is not bene ting the patient. The drug is available as capsules or liquid. It takes three to four months of daily use for SSRIs to have much impact on symptoms.

Combining SSRIs with other treatments

Drugs are often used alongside **cognitive behaviour therapy (CBT)** to treat OCD. The drugs reduce a patient's emotional symptoms, such as feeling anxious or depressed. This means that patients can engage more effectively with the CBT.

In practice some people respond best to CBT alone whilst others bene t more from drugs like *Fluoxetine*. Occasionally other drugs are prescribed alongside SSRIs.

Alternatives to SSRIs

Where an SSRI is not effective after three to four months the dose can be increased (e.g. up to 60mg a day for *Fluoxetine*) or it can be combined with other drugs. Sometimes different antidepressants are tried. Patients respond very differently to different drugs and alternatives work well for some people and not at all for others.

• **Tricyclics** (an older type of antidepressant) are sometimes used, such as *Clomipramine*. These have the same effect on the serotonin system as SSRIs.

Clomipramine has more severe side-effects than SSRIs so it is generally kept in reserve for patients who do not respond to SSRIs.

• **SNRIs** (serotonin-noradrenaline reuptake inhibitors). In the last ve years a different class of antidepressant drugs called SNRIs has also been used to treat OCD.

These are, like *Clomipramine*, a second line of defence for patients who don't respond to SSRIs. SNRIs increase levels of serotonin as well as another different neurotransmitter – **noradrenaline**.