

Treating Mental Disorders

Biological Treatments for Psychological Disorders

Aims: Describe and Assess Biological Treatments

Objectives

By the end of this session you should be able to:

- Describe the use of three biological treatments for mental disorders
- Describe the mode of action of three biological treatments
- Assess the appropriateness and effectiveness of three biological treatments
- Comment on the ethical implications of biological treatments

Assessment:

Essay Question:

(a) Describe two biological treatments for mental disorders.

(b) Assess these treatments in terms of their appropriateness and effectiveness.

Types of Biological Treatment

Basic principle: correct cognitive, emotional and behavioural problems by causing changes in biological functioning.

- Drugs (e.g. antidepressants, antipsychotics)
- Surgery (e.g. lobotomy, cingulotomy)
- Electro-convulsive Therapy

Drug Treatments for Psychological Disorders

- Different parts of the brain communicate by using chemicals called neurotransmitters.
- Drugs alter brain functioning by adjusting the levels of neurotransmitters
- Agonists increase neurotransmitter levels
- Antagonists decrease neurotransmitter levels.

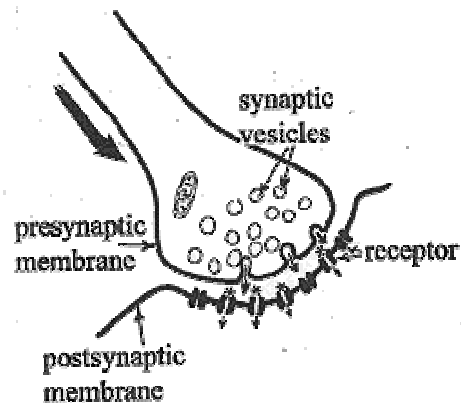
Neurotransmitters

- Dopamine (DA)
- Serotonin (5-HT)
- Noradrenaline (NA)

Drugs and Synaptic Activity

- Brain cells (neurones) communicate with each other at junctions called synapses.
- Drugs alter neurotransmitter levels by affecting how synapses work.

Fig 1: A Synapse



- A nerve impulse reaches the presynaptic terminal
- Vesicles containing neurotransmitter are released.
- The neurotransmitter drifts across the synaptic gap
- Neurotransmitter molecules bind to receptor sites on the postsynaptic neurone.
- This causes the postsynaptic neurone to produce a nerve impulse.

Drugs interfere with this process by either:

- Acting as if they are neurotransmitters (agonist)
- Causing the neurotransmitters to last longer in the synaptic gap (agonist)
- Blocking the receptor sites so the neurotransmitter can not activate them. (antagonist)

Common Psychiatric Drugs

Type of Drug	Used to Treat	Major Varieties
Antidepressant	Depression	MAOIs Tricyclics SSRIs
Anxiolytics	Anxiety	Barbiturates Benzodiazepines
Antipsychotics	Schizophrenia	Phenothiazines Butyrophenones Benzamides

Activity 1 – Actions of Different Antidepressants

Drug	Action & Neurotransmitter Affected	Mode of Action
MAOIs	DA, NA & 5-HT agonist	Stops neurotransmitters from being deactivated
Tricyclics	DA, NA & 5-HT agonist	Stops neurotransmitters from being taken back up
SSRIs	5-HT agonist	Stops neurotransmitters from being taken back up

Drug	Action & Neurotransmitter Affected	Mode of Action
Phenothiazines	DA antagonist	Blocks DA receptors
Benzamides	DA & 5-HT antagonist; Glutamate agonist	Blocks DA and 5-HT receptors; Prevents glutamate reuptake

Effectiveness of Drug Therapies

The effectiveness of a drug is assessed in terms of the percentage of a sample of patients taking the drug that experience a 'clinically significant improvement'.

Source	Drugs tested	% CSI
DGP (1993)	MAOIs Tricyclics SSRIs	50-54% (dropouts included as 'no CSI')
Barlow & Durand (1995)	Tricyclics	65% (dropouts excluded)
Davidson & Neale (1992)	Phenothiazines	60%
Kalat (1998)	Benzamides	65%

Effectiveness of Drug Therapies: Overview

- Drug treatment is usually superior to no treatment.
- Between 50 – 65% of patients benefit from drug treatments.
- 'Clinically significant improvement' does not mean 'cure'.
- Some patients may still have some symptoms.
- Between 35 – 50% of patients do not improve.
- Symptoms may return (or worsen) if drugs are stopped.

Appropriateness of Drug Therapies

- Drug therapies bring short-term improvements in most psychological symptoms.
- Patients often welcome drug therapy, as it is quicker, easier and less threatening than talk therapy.
- Drugs make it possible for the patient to benefit from other therapies.
- Some drugs cause dependency.
- All drugs have the potential to produce side effects.

Drug	Main side effects
MAOIs	Hypertension Toxic when taken with other drugs Toxic when taken with some foods
Tricyclics	Weight gain (average 7kg) Cardiac problems Potential for overdose Sudden death in children (rare)
SSRIs	Upset stomach Insomnia Severe anxiety(rare)

Side effects of different drugs cont.

Phenothiazines	Weight gain Inability to concentrate Parkinsons symptoms Akinesia (immobile face) Tardive dyskinesia (twitching)
Benzamides	Loss of white blood cells (rare, but potentially fatal)

Side Effects are a Problem Because:

- They are distressing for the patient.
- They may be worse than the symptoms the drug was supposed to treat.
- They may affect the patient's willingness to continue treatment.

Ethics: some questions to consider:

- Is it significant that most of the clinical trials of the effectiveness of drug therapies are conducted and paid for by the companies that produce the drugs?
- Is it right to force a schizophrenic patient to take antipsychotics, even if they suffer from side effects?
- Do you think it matters that, in a survey of psychiatrists by Haddock and Slade (1996), more than half said they would refuse phenothiazines if they were prescribed to them?

Surgical Treatments for Psychological Disorders

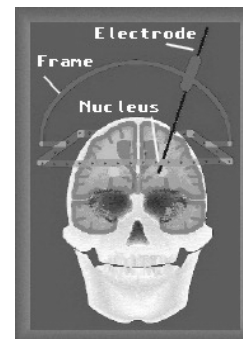
- Different parts of the brain control different psychological processes.
- Abnormalities in the brain can cause psychological symptoms.
- Disconnection or destruction of brain tissue can relieve some symptoms.

Methods Used to Surgically Alter the Brain

- Cutting
- Burning with an electrode or laser
- Injecting neurotoxins
- Destruction using gamma radiation (non-invasive)

General Procedure

- Surgery taken place while the patient is conscious.
- The scalp is removed and the skull opened up.
- The surgeon uses a stereotaxic instrument to navigate around the brain.
- Scanning technology is used to track the operation's progress.



Procedure	Used to Treat	Involves	Comments
Frontal Lobotomy	Schizophrenia	Severing the entire frontal lobe of the brain	No longer used
Leukotomy	Schizophrenia Anorexia Depression Anxiety	Less radical lobotomy	Rarely used, banned in some countries
Cingulotomy	Anxiety (OCD)	Severing connections between frontal lobes and limbic system	Less radical, but used only as a last resort
Callosotomy	Epilepsy	Severing connection between cerebral hemispheres	Used in life-threatening cases

Effectiveness of Surgery

- Lobotomy: not clinically effective, but makes patient more docile and manageable.
- Leukotomy: some success, but similar problems to lobotomy.
- Cingulotomy: Case studies suggest CSI in about 60% of cases.

Appropriateness of Surgery

Surgery is used only as a last resort, where the patient has failed to respond to other forms of treatment and their disorder is very severe.

This is because:

- All surgery is risky.
- The effects of neurosurgery can be unpredictable.
- There may be no benefit to the patient.
- The effects are irreversible.
- Surgery has been abused in the past, especially lobotomy and leucotomy.

Summary

- Biological treatments alter the functioning of the brain.
- They include drugs, surgery and ECT.
- Drugs are effective in 50-65% of cases, but can cause side effects.
- Surgery can work, but is used as a last resort.