MEDICINE
KING SAUD UNIVERSITY

436 team pharmacology

MCQs | SAQs | summury

Pharmacology of neurotransmitters

قادة فريق علم الأدوية :

لين التميمي & عبدالرحمن ذكري

الشكر موصول لأعضاء الفريق المتميزين :

جواهر الخيال

شذا الغيهب

روان سعد القحطاني

pharma436@outlook.com @pharma436

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Summary

NT	Function	Diseases that are influenced
Acetylcholine	• Ach functions as a **neuro-modulator** which alters the way other brain structures process information. • Ach is both excitatory and inhibitory. • Ach is thought to be involved in cognitive functions such as : ➢ **Memory** ➢ Arousal ➢ Attention	• Damage to cholinergic receptors is associated with memory deficits as **in Alzheimer's disease.** • Muscarinic antagonists as hyoscine cause amnesia • Increased brain level of Ach predispose to **Parkinson's disease** • Schizophrenia may be due to imbalance between Ach & dopamine brain levels. • Depression may be a manifestation of a central cholinergic predominance.
Dopamine	• Dopamine has 4 pathway to synapse in and give its action : 1- In chemoreceptor trigger zone (CTZ)→ (Antiemetic effect) 2- In mesolimbic system→(psychiatric effect) 3- In nigrostriatal system (basal ganglia) → (neurologic effect) 4- In tuberoinfundibular pathway (lead to Hyperprolactinemia)→ (endocrinal effect)	**Ameliorate Schizophrenia** **Parkinson's disease** **Depression** Drug addiction Attention deficit hyperactivity disorder*
Norepinephrine	It is a catecholamine also called noradrenaline the direct precursor of NE is dopamine The CNS effects of NE are manifested in: ➢ Alertness ➢ arousal ➢ readiness for action.	A variety of medically important drugs work by altering the actions of NE e.g., for treatment of CV problems and **some of psychiatric conditions.** • Mood disorders: **Mania → high NE** **Depression → low NE**
Serotonin (5-HT)	5-hydroxytryptamine (5-HT) is a monoamine. Primarily found in the CNS, GIT, platelets. It is a popular thought that serotonin is responsible for **feeling of well-being & happiness**. It plays an important role : **in regulation of Mood, sleep, appetite and pain perception**. and some cognitive functions, including memory and learning.	Modulation of serotonin at synapses is a major action of several classes of **antidepressants** eg **selective serotonin re-uptake inhibitors (SSRIs).** **Schizophrenia** , Vomiting Generalized anxiety, Social phobia **Obsessive compulsive disorders**
GABA	• **GABA is the main inhibitory in the brain** • Present throughout the brain. • there is very little in peripheral tissues	**Decrease GABA** brain content is associated with : **Epilepsy** Anxiety Convulsions Insomnia **Benzodiazepine (diazepam) enhances GABA function and used in treatment of above diseases**
Glutamate	• excitatory neurotransmitter • **increase in its level** predispose to **epilepsy**	• **Reduction of brain damage following :** • **strokes & head injury** • Drug dependence, Schizophrenia • **Treatment of epilepsy**

MCQs

1- A patient diagnosed with Epilepsy, which of the following drugs is the best in his case ?

A) Levodopa . B) diazepam. C) Risperidone .

2- Which of the following transmitter predominantly involved in psychosis ?

A) serotonin. B) norepinephrine. C) dopamine.

3- Which of the following transmitter predominantly involved in psychosis ?

A) serotonin. B) norepinephrine. C) glutamate.

4- A 35 year old female with schizophrenia come to the clinic complaining from late pregnancy. A analysis test was preformed and the doctor found elevated level of prolactin. Which of the following drug cause such side effect?

A) dopaminergic drugs.
B) anticholinergic drugs.
C) glutamate antagonists drugs.

5- Which of the following transmitter play an important role in memory and learning ?

A) Serotonin. B) Dopamine. C) Acetylcholine.

6- Which of the following transmitter predominantly involved in Alzheimer's disease?

A) Serotonin. B) Dopamine. C) Acetylcholine.

7- Which of the following transmitter predominantly involved in Obsessive compulsive disorders?

A) Serotonin. B) Dopamine. C) Acetylcholine.

Answer:
1) B
2) C
3) C
4) A
5) C
6) C
7) A

MCQs

8- Which of the following transmitter predominantly involved in Epilepsy?

A) Glutamic acid. B) GABA. C) Both.

9- Which of the following statement correct about acetylcholine ?

A) It is the main inhibitory neurotransmitters
B) It is neuromodulator.
C) Has no role in Parkinson's disease.

10- A 36 male has a head injury due to car accident, if he develop a brain stroke later, Which of the following neurotransmitters may Reduce the brain damage?

A) dopamine B) Glutamic acid. C) GABA

Answer:
8) C
9) B
10) B

SAQs

A 29 year old Male patient came to the clinic complaining of insomnia and changing in his mood, He also mentioned loss of appetite for the last few weeks.

1- What's the neurotransmitter that is most likely disturbed in it's level ?

Serotonin

2-Where's this neurotransmitter usually found ?

CNS, GIT, platelets

3- list some other disorders that are influenced by changes in this neurotransmitter?

Obsessive compulsive disorders, Schizophrenia, Depression, Generalized anxiety, Social phobia and vomiting