

NEUROPSYCHO PHARMACOLOGY

OF SEX

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INTRODUCTION:

- Chief sexual organ in the body is brain. Neuroendocrines are primarily responsible for functioning of brain. Neurochemical electric impulses control entire spectrum of activities of brain. Neurotransmitters regulate and modify psychiatric and sexual activities. In order to understand effects of psychiatric disorders and psychotropic medicines one need to understand role of neurotransmitters in sexual response.

METHOD:

- Internet search was made at various medical websites like medscape, psych info, ISSM etc using key words neurotransmitter, antidepressants, antipsychotics, psychosis, depression and anxiety.

RESULTS:

- Most important neurotransmitters controlling sexual function are serotonin, dopamine, non adrenaline, oxytocin, endorphins, acetylcholine GABA, NO. Medication like typical and atypical antipsychotics ,SSRI,s ,mood stabilizers' benzodiazepine has adverse effects on sexual function. Psychiatric disorders like schizophrenia , OCD, anxiety, depression impair sexual functions.

Balancing Neurotransmitter



DOPAMINE

- At PVN and MPOA of hypothalamus dopamine act as facilitator of erection. APOMORPHINE D1& D2 receptor agonist induces erection when given orally. Like wise bromocriptine, lasuride, amantadine, pramipexole, ropinirole improve sexual function. Antipsychotics having dopamine antagonist properties impair libido and drive. Atypical antipsychotic having lesser affinity for D2receptor causes lesser sexual dysfunction.

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- Prolactin levels is an index of dopaminergic activity. High prolactin suggests lower dopaminergic firing with clinical manifestation of loss of libido.
- Dopaminergic antidepressant like BUPROPION has salutatory effect on sex drive.
- D1 receptor is more specific for erection while D2 is related to libido and orgasms

Dopamine is like SUN RISE



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SEROTONIN: Generally speaking serotonin has inhibitory effect in CNS



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- . It decreases libido and increase IVLT. Different serotonergic receptors has variable on sexuality. 5HT_{2C} is responsible for delaying of ejaculation and loss of drive. Action of 5HT_{1A} is facilitatory for sex.
- 30%- 60% of the patients on antidepressant therapy have sexual dysfunction in form of delayed orgasm, anorgasmia esp females, loss of libido, and ED

EFFECTS ON ORGASM

- Seminal emission and ejaculation are under control of anterior thalamic nuclei, preoptic nucleus and median forebrain bundle. This is an area that is active in integration of sexual response in the human male. In this area, there is the nucleus paragigantocellularis (nPGI). It exerts tonic inhibition to ejaculation on the lumbosacral cord. It work chiefly serotonin.
- 5HT₂ receptor agonists delays ejaculation and cause Anorgasmia. This side effect is used fortreatment of PME

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- Inhibit nitric oxide synthesis.
- Desensitize the receptors.
- Have antidopaminergic action.
- Increases prolactin in antipsychotic induced hyperprolactinaemia.
- Sexual side effects of serotonergic medication depends on actions of target receptors. Hence 5HT_{2C} target recptor of fluoxetine would cause delaying of ejaculation and lowering of drive. While in case of buspiron partial antagonist of 5HT_{1A} will not effect sexual function.
- FLIBANSERIN a newer drug for HSD is 5HT_{1A} antagonist and 5HT_{2A} antagonist is in the to the market

NORADRENALINE has mix effect



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- Central activation from locus ceruleus has stimulatory effect on sex desire.
- Increased sympathetic activity causes vasoconstriction leading to
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- detumescence. It also speeds up ejaculatory reflex which may cause PME. Yohimbine is an alpha 2 blocker used for ED and to reverse SSRI-induced anorgasmia.

NITROUS OXIDE

- NO is most important for arousal and erection. It has facilitatory effect both at central and peripheral level.
- PDE5 inhibitor (viagra) blocks degradation of c GMP to enhance effects of NO.

ENDORPHINES

- Potent analgesic are inhibitory to sexual derive but has property of increasing intravaginal latency time.
- Endorphines are poured during orgasm which increases IVLT for subsequent intercourses.
- Naltraxone is some time added in resistant cases of ED.

OXYTOCIN

- Oxytocin is generally known as love or cuddling hormone. Stimulation of oxytonic receptors in PVN of hypothalamus induces erection. Oxytocin not only hastens but also intensify orgasm .It improves contractility of seminiferious tubules ,epididymis and prostate gland to aid sperm release.
- It modulates androgen level by converting testosterone into dihydrotestosterone .Oxytocin help prevent development of tolerance to opiod and can attenuate morphine withdrawals symptoms In animal studies oxytocin role in treatment of depression is being evaluated.

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- Through stimulation of erogenous zone and during orgasm oxytocin level are increased . MDMA known as ecstasy and long term use of PDE5 inhibitor and increase OXT .While long term use of SSRIs reduces its level. OXT cannot cross BBB so systemic administration cannot produce desirable effects. Recently intranasal OXT has been introduced it is claimed 10% of crosses BBB.

CONCLUSION

- A comprehensive knowledge of psychopathology of disease and psychopharmacology of drugs is needed for efficient management of sexual aspect of psychiatric patient.



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