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A Comparative Review on Avanafil vs Tadalafil vs Sildenafil Tablet

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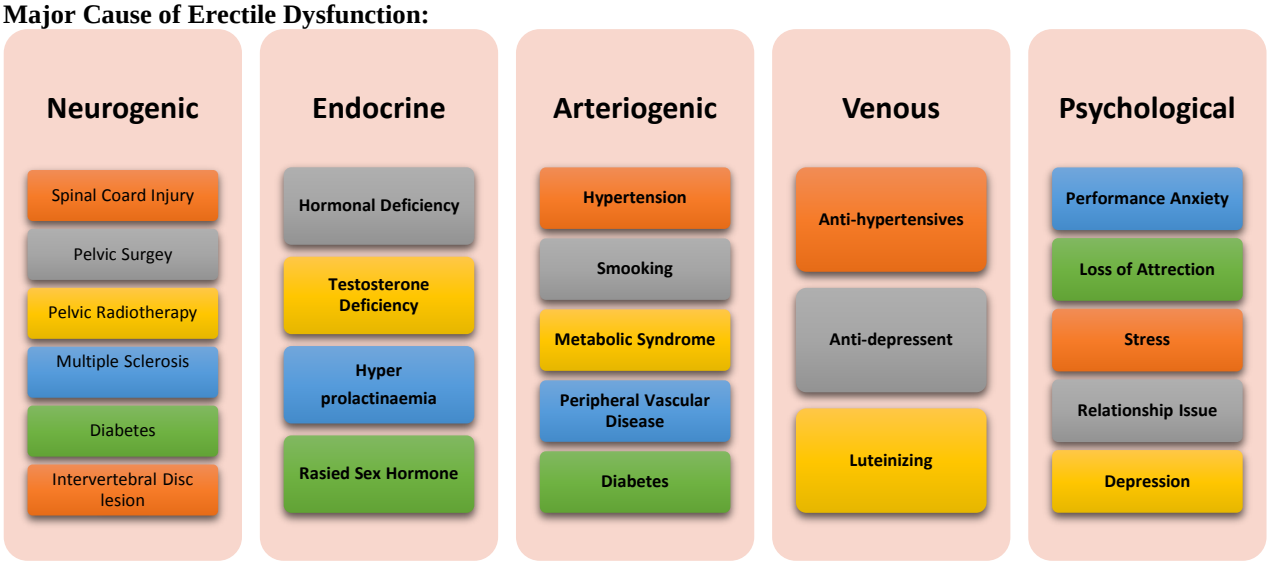
Abstract
The first common thing is Avanafil, Tadalafil and Sildenafil drugs are used to treat or cure to the male erectile dysfunction (ED). These drugs are available in the form of tablets have various brand name. Oral phosphodiesterase type 5 inhibitors (PDE5-Is) are considered to be effectual procedure for the cure of treatment of erectile dysfunction. Three of these drugs avanafil, tadalafil and sildenafil are recommended by the European Medicines Agency (EMA) and the Food and Drug Administration (FDA) for the treatment of erectile dysfunction.

Erectile Dysfunction (ED)
Erectile dysfunction is a multifaceted but usually in male sexual dysfunction that involves an alteration in any of the components of the erectile response, including organic, relational, biological and psychological factor. Erectile dysfunction is interpreted as the powerlessness to sustain an erection well enough to execute intercourse and ejaculation. Erectile dysfunction is a very usual disorder of male sexual desire, influence all age groups with a considerable impact on quality of life.
It is also knowing as the impotency or persistent inability to reach or keeping penile erection enough for adequate sexual pleasure or performance. The Erectile dysfunction Influences more than 30 million men per year; yet only about 2 lakhs seek help from a physician. Erectile dysfunction rest globally unnoticed simply because many men do not talk about sexual complication with their physician. According to recent research all men will experience some stage of sexual issue or complication at one time to another, at most those who are not able to have desired intercourse 70 to 80 % of the time are considered impotent. Penile erection is a multiplex activity involving interactions between biological, neural, psychological, vascular, and hormonal elements. The avenue of usual sexual function in males consists of four steps: sexual desire/drive, erection, ejaculation/orgasm and detumescence (penile flaccidity). In the over, ED was observed, in most instance, to be a completely psychogenic disorder, but various evidence suggests that about 80% of cases have an organic aetiology. Causes of organic erectile dysfunction can now be widely classify into nonendocrine and endocrine. The nonendocrine aetiologies, vasculogenic (hit hard to blood supply) is the most usual and can mean arterial inflow disorders and oddity of venous outflow there are also neurogenic (affecting innervation and nervous function) and iatrogenic (relating to a medical or surgical care) aetiologies. In terms of endocrine element prime to erectile dysfunction, decrease serum testosterone levels have been indicate, but the exact procedure has not been fully elucidated. Often, organic erectile dysfunction involves a psychological component; that is, nevertheless of the involving event, erectile dysfunction imposes gloomy effects on interpersonal relationships, temper and quality of life.

Major Cause of Erectile Dysfunction:



Flow Chart of Major Cause of Erectile Dysfunction

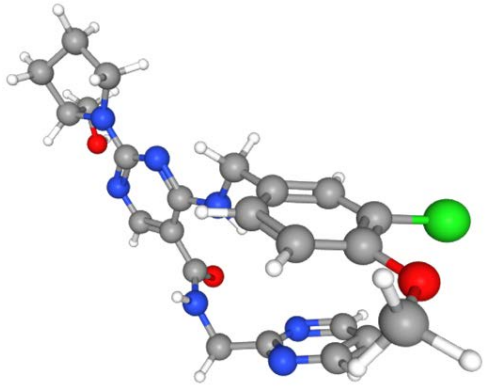
AVANAFIL:

Avanafil, is a unique phosphodiesterase type 5 inhibitor, for the treatment of erectile dysfunction. It was officially approved by the United State Food and Drug Administration (USFDA) for the treatment of erectile dysfunction on 27 April, 2012. This drug has been appeared to have significant selectivity of phosphodiesterase type 5 and a higher selectivity against phosphodiesterase type 1 and phosphodiesterase type 6.

Designated Chemically

(S)-4-((3-Chloro-4-methoxybenzyl)amino)-2-(2-(hydroxymethyl)pyrrolidin-1-yl)-N-(pyrimidin-2-ylmethyl)pyrimidine-5-carboxamide

Structure



Molecular Formula

C23H26ClN7O3

Molecular Weight

483.95 g/mol

Solubility

ethanol, practically insoluble in water, soluble in 0.1 mol/L hydrochloric acid

Appearance

White Crystalline Powder

Mechanism of action

Avanafil works by inhibiting the effect of PDE5 on degradation of cGMP. This inhibition leads to penile erection due to the inflow of blood into the area

Dosage and Administration

The recommended initial dose of avanafil is 100 mg by orally approximately 20 to 30 minutes before to sexual performance. This medication can be taken with or without regards to food. Based upon effectiveness and tolerability, the dose can be increased higher up to a 200 mg maximum dose or decreased lower up to 50 mg. The drug should not be used in patients with severe renal or hepatic impairment.

Adverse reactions

After the clinical trials the most documented evidence of adverse effect Throughout clinical trial experience, the most commonly documented adverse reactions cover backpain, nasal congestion, headache, flushing, and nasopharyngitis These adverse reactions were seen in 2% or more of the patients studied in clinical trials. Other adverse reactions that occurred in less than 2% of the patients included the following: upper respiratory infection (URI), bronchitis, sinusitis, sinus congestion, influenza, hypertension, nausea, dyspepsia, constipation, Back pain, dizziness, arthralgia, and diarrhea.

Drug Interaction

The effect of avanafil in combination with any organic nitrate is contraindicated. In a life-threatening situation, nitrate medication can only be administered at least 12 hours after the last dose of avanafil was administered. Caution must be taken when using avanafil concomitantly with alpha-blocker medications and antihypertensive medications. The use of alcohol along with avanafil is not recommended due to the increased potentiation of Blood Pressure lowering effects leading to orthostatic hypotension, headache, and dizziness.

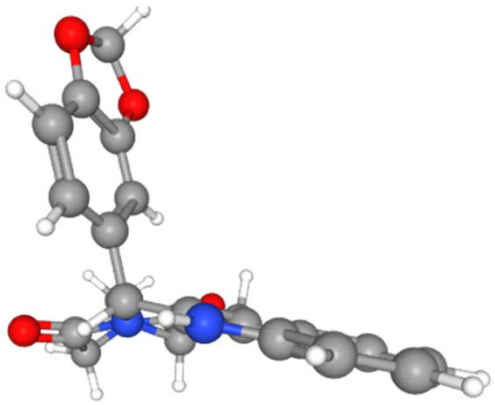
TADALAFIL

PDE5 inhibitors are widely used as an on-demand treatment regimen because of their tiny period of efficacy. However, tadalafil, unique among other PDE5 inhibitors, has demonstrated efficacy near about 30 to 35 hour and is not affected by the intake of food. Thus, tadalafil could be taken daily, such as once a day, to provide regular efficacy, which would enable person to engage in sexual intercourse at any time, eliminating the required to take a dose earlier than intercourse. tadalafil act by greater blood flow to the penis to help a man achieve and stay an erection.

Designated Chemically

(6R-trans)-6-(1,3-Benzodioxol-5-yl)-2,3,6,7,12,12a-hexahydro-2-methyl-pyrazino(1',2':1,6)pyrido(3,4-b)indole-1,4-dione

Structure



Molecular Formula

C22H19N3O4

Molecular Weight

389.4 g/mol

Solubility

ethanol, practically insoluble in water,

Appearance

White Powder

Mechanism of action

Penile erection during sexual activity is achieved by the relaxation of penile arteries and corpus cavernosal smooth muscles, prime to greater blood flow to the particular organ.

Dosage and Administration

The recommended initial dose of tadalafil is 10 mg by orally once a day. This medication can be taken with or without regards to food. Based upon effectiveness and tolerability, the dose can be increase or maintain higher up to a 20 mg maximum dose or decreased lower up to 5 mg.

Adverse reactions

The most common potential adverse effect of using tadalafil are backpain, burping acid reflux, headache, stomach discomfort or pain, indigestion, muscle aches, flushing, and stuffy and runny nose. These adverse reactions reflect the ability of PDE5 inhibition to cause vasodilation (cause blood vessels to widen), and usually resolve after some time.

Drug Interaction

Administration of tadalafil to person who are consuming any form of organic nitrate, is contraindicated. In pharmacology studies, tadalafil was shown to potentiate the hypotensive outcome of nitrates. In a person who has consume tadalafil, where nitrate administration is deemed recommended in a life-threatening condition, minimum 48 hours should elapse after the last dose taken of tadalafil before nitrate administration is considered. In such cases, nitrates should still only be administered under close supervision by doctor with appropriate hemodynamic monitoring.

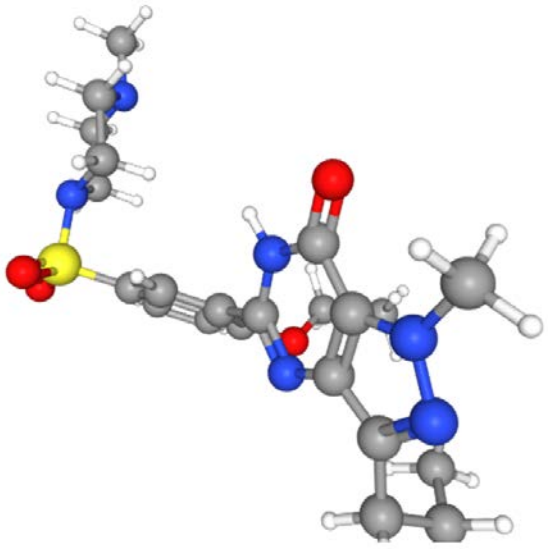
SILDENAFIL

Sildenafil citrate well knows as Viagra. Sildenafil was approved in the year 1998, more than 1 billion doses of sildenafil citrate have been recommended as a treatment for erectile dysfunction or sexual dysfunction on record. It acts by inhibiting cyclic guanosine monophosphate (cGMP)-specific phosphodiesterase type 5 (PDE5). it muscles of the blood vessels and greater blood circulation to particular areas of the body.

Designated Chemically

1-[[3-(6,7-dihydro-1-methyl-7-oxo-3-propyl-1H-pyrazolo[4,3d]pyrimidin-5-yl)-4-ethoxyphenyl]sulfonyl]-4-methylpiperazine.

Structure



Molecular Formula

C22H30N6O4S

Molecular Weight

474.5764 g/mol

Solubility

Soluble in Organic solvent

Appearance

Off White crestline Powder

Mechanism of action

The mechanism of erection of the penis involves secrete of nitric oxide (NO) in the corpus cavernosum during sexual stimulation. NO then activates the enzyme guanylate cyclase, which outcome in increased levels of cyclic guanosine monophosphate (cGMP), generating effortless muscle relaxation in the corpus cavernosum and permitting inflow of blood. Sildenafil has no direct relaxant effect on isolated human corpus cavernosum, but increase the effect of nitric oxide by inhibiting phosphodiesterase type 5 (PDE5), which is responsible for degradation of cGMP in the corpus cavernosum. When sexual stimulation causes local release of NO, inhibition of PDE5 by sildenafil causes increased levels of cGMP in the corpus cavernosum, resulting in effortless muscle relaxation and inflow of blood to the corpus cavernosum. Sildenafil at recommended doses has no effect in the absence of sexual stimulation.

Dosage and Administration

For the Maximum person, the prescribed dose is 50 mg taken by orally, as needed, near about 1 hour before sexual intercourse. However, sildenafil may be taken from 30 minutes to 4 hours before sexual intercourse. It is the maximum prescribed dosing parameter is once per day. Based on result and toleration, the dose may be increased to a maximum recommended dose of 100 mg or decreased to 25 mg.

Adverse reactions

The adverse reactions of the sildenafil occurred at a rate of >2%, but similarly usually on placebo respiratory tract infection, back pain, flu syndrome, and arthralgia. In fixed-dose studies, dyspepsia (17%) and abnormal vision (11%) were more common at 100 mg than at lower doses. At doses increase the recommended dose range, adverse events were similar to those detailed above but generally were reported more frequently.

Drug Interaction

Administration of Sildenafil with nitric oxide donors such as organic nitrates or organic nitrites in any form is contraindicated. Consistent with its reported effects on the nitric oxide/cGMP pathway, sildenafil was shown to potentiate the hypotensive effects of nitrates. In a drug-drug interaction study sildenafil 50 mg given with alcohol 0.5 g/kg in which mean maximum blood alcohol levels of 0.08% was achieved, sildenafil did not potentiate the hypotensive effect of alcohol in healthy workers. When sildenafil 100 mg was co-administered with amlodipine (5 mg or 10 mg) to hypertensive patients, the mean additional reduction on supine blood pressure was 8 mmHg systolic and 7 mmHg diastolic

COMPARATIVE PARAMETER OF AVANAFIL VS TADALAFIL VS SILDENAFIL

Description	Drugs		
Parameters	Avanafil	Tadalafil	Sildenafil
Year of Approval	2012	2003	1998
Dosages (In mg)	50/100/200	5/10/20	25/50/75/100
Half-life (In hrs)	5	17 to18	4
Dissolution Time	45 Min	30 Min	45 Min
Taken	15 Min before sexual intercourse	30 Min before sexual Intercourse	30-60 Min Before Sexual Intercourse
Storage Condition	20°C - 25°C	20°C - 25°C	20°C - 25°C

Comparing Function

The medicines all functions in a similar direction and all are in PDE5 inhibitor. It helps to moderate the muscles and increase blood flow in the body or particular area. This makes it easier for blood to get into the penis, and it permit people with erectile dysfunction to experience a lasting erection during sexual pleasure or intercourse. These drugs are also helping to maintain the erection long sufficient to have sex and satisfy your sexual desire

Comparing Adverse Effect

Description	Drugs		
Parameters	Avanafil	Tadalafil	Sildenafil
Stuffy	✓	✓	✓
Headache	✓	✓	✓
Dizziness	✓	✓	✓
Vision Change	-	-	✓
Color Blindness	-	-	✓
Rash	✓	✓	✓
Back Pain	✓	✓	✓
Diarrhea	-	✓	✓
Flushing	✓	✓	✓
Respiratory Infection	✓	-	✓

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The article compiled here are collected over a period of time and may have been reproduced verbatim. Apologize to all researchers if in-advertently failed to acknowledge them in the references.

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