Drugs 2003; 63 (20): 2213-2214
0012-6667/03/0020-2213/$33.00/0

Tadalafil

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Tadalafil is the second representative among three phosphodiesterase type 5 (PDE5) inhibitors (sildenafil, tadalafil and vardenafil) marketed for the treatment of erectile dysfunction (ED). The features of this new compound which distinguish it from the two other PDE5 inhibitors are its completely different molecule structure, its selectivity profile and its pharmacokinetic profile.

With its 780-fold higher selectivity for PDE5 than PDE6 in the retina, tadalafil has a negligible impact on retinal function, reflected by the ≤1% visual disturbance rate in clinical trials. In terms of impact on retinal function, tadalafil has an advantage over sildenafil.

On the other hand, at therapeutic doses, tadalafil is not a pure PDE5 inhibitor, but a mixed PDE5/11 inhibitor. PDE11 is found in various tissues such as testicles, skeletal muscle, the pituitary gland, the prostate and the heart. To date, knowledge regarding the importance of this enzyme is sparse. However, the entire clinical program of tadalafil (which involved >4000 patients), did not raise any safety concerns with regard to its inhibitory potential against PDE11.

The long half-life of tadalafil (17.5 hours) translates into a considerably longer period of clinical responsiveness than that of the two other PDE5 inhibitors (4–5 hours). Even after 36 hours, the majority of patients were able to complete sexual intercourse. There is no doubt that this special pharmacokinetic profile of tadalafil is an affective aspect for patients and their partners, relieving them from any time constraints and, consequently, making sexual activities more spontaneous and therefore more natural.

In terms of efficacy (75% success rates for successful completion of intercourse) and safety, the high dose (20mg) of tadalafil is, without any doubt, challenging the high doses of the two competitive PDE5 inhibitors. The 10mg dose of tadalafil (61% success rate) seems to be somewhat inferior to the lower doses of vardenafil (10mg) and sildenafil (50mg).

To conclude, due to its unique pharmacokinetic profile, tadalafil represents a considerable step forward to achieving the ideal oral treatment for the management of male ED. ▲