Evaluating erectile dysfunction: Oral sildenafil versus intracavernosal injection of papaverine

BOBBY VISWAROOP, ANTONISAMY B., GANESH GOPALAKRISHNAN

ABSTRACT

Background. Intracavernosal injection of vasoactive drugs is an established method of evaluating erectile dysfunction. However, it is invasive and may be associated with pain and priapism. We investigated the use of oral sildenafil as a possible substitute for intracavernosal agents.

Methods. Men with erectile dysfunction were randomized into two groups of 25 each. One group of 25 men received injection papaverine initially followed by oral sildenafil, and another 25 received oral sildenafil followed by injection papaverine. Genital self-stimulation was used in both the groups. Penile length and circumference as well as angle of erection, before and after each medication, were recorded. Two days later, the intervention arms were crossed over. Subjective responses were obtained. The effect of medication on each outcome variable was studied by using analysis of variance models in relation to patient, period and medication.

Results. There was statistically significant improvement from the baseline value in both the arms, i.e injection papaverine and oral sildenafil (p<0.001, p<0.001, respectively) for both penile length and circumference. No significant difference was observed between the two medications in the outcome measures.

Conclusion. Oral sildenafil was as effective as injection papaverine in evaluating erectile dysfunction.


INTRODUCTION

Erectile dysfunction (ED) is a common clinical problem affecting men of all ages. Evaluation of ED was the terrain of psychotherapists before the 1980s. Since the introduction of papaverine in 1982 by Virag, testing by intracavernosal injection of pharmacological agents became a well accepted procedure in the evaluation of ED. While age is a definite risk factor for ED, to our surprise, a majority of men attending our clinic are young and unmarried. We use intracavernosal agents routinely in these men to demonstrate their erectile power and, at the same time, to reassure them. However, injections are painful and associated with fear, anxiety, risk of extravasation and priapism. Prostaglandins, though freely available, are expensive. Oral therapy is preferred to invasive medical or surgical therapies as demonstrated in studies done before the availability of oral drugs. Sildenafil is an established oral therapy for ED. It has also been shown to be useful as a second-line testing agent along with colour Doppler ultrasound (CDU). We aimed to assess whether oral sildenafil was as useful as injectable papaverine in the evaluation of men with ED.

METHODS

Fifty men between 21 and 65 years of age who presented to our outpatient clinic at the Christian Medical College, Vellore, with a history of ED irrespective of aetiology, marital status and duration of ED were recruited for the study. Men in whom the use of either sildenafil or papaverine was contraindicated were excluded. All patients had at least a one month history of ED. A sexual function questionnaire was used to record the medical and sexual history. All patients underwent a detailed physical examination followed by focused vascular and neurological examinations. Biochemical investigations (lipid profile, serum testosterone, prolactin, follicle-stimulating hormone and luteinizing hormone) were done when indicated.

We used a cross-over study design. The sample size was calculated with 80% power of detecting a treatment benefit of 0.75 cm in length and the within-subject variance of the difference in mean length between the two periods of 3.34 cm, based on the two-
There was a statistically significant improvement in penile circumference with papaverine compared to sildenafil (p < 0.001). The mean (SD) penile length was 7.71 (1.26) cm at baseline, improved with papaverine by 4.27 cm (11.98 [2.40] cm) and with sildenafil by 3.95 cm (4.44 to 3.64) cm. The difference in penile circumference was significant in both the arms but improved in the papaverine arm by 4.27 cm (11.98 [2.40] cm). The improvement in outcome variables, i.e., length, circumference and angle of erection was similar with papaverine and sildenafil (p values 0.45, 0.19, 0.96, respectively).

Subjective parameters, when analysed, showed that 20 of the 50 men (40%) favoured the oral drug over injection, compared with 24 men (48%) who favoured the injection. Three men (6%) scored equally for both the medications and 3 (6%) had no response to either. Five men had priapism (10%) following injection; of them, 3 required a corporal wash. Following sildenafil, 2 had headache (4%), 1 had blurring of vision (2%) and 1 had dyspepsia (2%).

**DISCUSSION**

The 1993 National Institutes of Health (NIH) Consensus Panel defined ED, a relatively common problem affecting men of all ages, as ‘the inability to achieve and/or maintain an erection sufficient for satisfactory sexual activity’. In the Massachusetts Male Aging Study (MMAS), 52% of subjects had some degree of ED and 35% of men aged 40–70 years reported moderate to complete impotence. ED was found to be an age-dependent disorder with a prevalence ranging from 0.1% at 20 years of age to 75% at 80 years. Invasive and non-invasive methods have been used to understand the mechanism of erection and its alteration in illness. Nocturnal penile tumescence (NPT) was considered the first diagnostic test in the impotent male and is based on the change in penile diameter during sleep. The device to measure this is sophisticated, expensive, requires at least 2 nights in a sleep laboratory and includes polysomnographic monitoring to rule out a sleep disorder. The NPT methodology has been criticized because of its failure to include adequate measurements of both circumference and rigidity.

Pharmacological testing agents not only indicate the presence or absence of organic conditions, but are also predictors of the therapeutic response. The ideal agent for pharmacological testing should be one that will cause full but not prolonged erection. Unfortunately, there is no ideal drug available, nor are the criteria for erectile response defined. Papaverine and prostaglandins have been used extensively, but are associated with side-effects such as priapism, pain and ecchymosis. Audiovisual sexual stimulation (AVSS) has been used to distinguish between organic and psychogenic causes of ED. Slob et al. reported the use of AVSS.
in conjunction with NPT and an erectometer, and concluded that it may be useful as an initial screening test.

A literature review revealed inconsistent data regarding the erogenous capacity of AVSS without pharmacological testing agents. Cahill et al.21 were unable to obtain any meaningful response in 25 patients and Fouda et al.22 found a positive response to AVSS alone in 6.6% of their patients. Moreover, AVSS does not usually result in ejaculation and some patients may have a cultural or moral aversion to pornography.23

Genital stimulation is usually involved in foreplay and is more physiological.24 The main argument against the use of sildenafil in the experimental setting was the lack of sexual stimulation. We use tactile stimulation routinely in our clinic along with intracavernosal injections. We decided to test this hypothesis in addition to assessing objectively the role of sildenafil in the evaluation of ED. Rigiscan, rigidiometer and snap gauge can be used to evaluate rigidity but such equipment adds to the cost of evaluation.24

We found that oral sildenafil is as effective as papaverine. The subjective and objective responses were highly corroborative. Though the onset of erections was delayed, their duration and quality were comparable. Adverse effects were seen in only 8% of men; all these effects were mild and none of the men had priapism. The response in men who had had no prior sexual encounter was also favourable.

In summary, oral sildenafil was as effective as injection papaverine in evaluating ED. We recommend the use of oral sildenafil with genital self-stimulation as an office procedure in the evaluation of ED, especially in young men with psychogenic impotence.

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REFERENCES