ORIGINAL ARTICLE

ProstaglandinE1 for the Medical Management of Erectile Dysfunction

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ABSTRACT

Aid of the study: To evaluate the efficacy of Prostaglandin E1 in the management of erectile dysfunction as intracavernosal pharmacotherapy
Methods: A total of 42 impotent patients received ProstaglandinE1 intracavernosal injection at urology/andrology out patient department of Surgimed Hospital & Ghurki Trust Teaching Hospital. All gave a previous history of using to papaverine and phentolamine intracavernosal therapy.
Results: Thirty three patients (78.5%) achieved an erection sufficient for sexual intercourse and after a mean follow-up period of 3.8 months, 21 patients were continuing to use treatment successfully. The average dose was 14 micrograms (range 2.5 to 30 micrograms). There were no cases of priapism or cavernosal fibrosis and no systemic side effects. Slight local discomfort was reported in 8(3.3%) patients.
Conclusion: Prostaglandin (Caverject) is a safe and effective intracavernosal therapeutic agent for the treatment of erectile dysfunction. Ishii 5 described the use of prostaglandin-E1, and many studies have since showed its efficacy with a reduced incidence of fibrosis and priapism.6'7'8 though it adversely causes severe pain locally. Padma-Nathan considered prostaglandin as the treatment of choice, alone or in combination with other drugs.
Key words: ProstaglandinE1, Erectile dysfunction, intracavernosal agent

INTRODUCTION

A surgeon, by accident injected Papaverine near the penis while performing a bypass procedure. This led to rigid erection for 2 hours duration in the patient. Papaverine hydrochloride, USP is the hydrochloride of an alkaloid obtained from opium or prepared synthetically. It belongs to the benzylisoquinoline group of alkaloids and was used for intracavernosal therapy for the management of erectile dysfunction in 1982 by Virag1. Virag originally described the use of the smooth muscle relaxant papaverine while Brindley 2 demonstrated the effectiveness of the alpha adrenergic receptor blocker phentolamine.

The combination of papaverine and phentolamine was then use as 2 agent solution for intracavernosal use and was shown to be more effective than either agent alone 3'4 but with a significant incidence of formation fibrotic nodule in the cavernous tissue. Prostaglandin (Caverject) is a very potent agent for intracavernosal use

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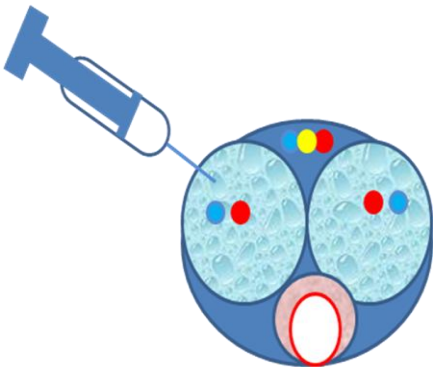
MATERIAL AND METHODS

Forty two patients with erectile dysfunction were seen in urology outpatient department. After a detailed sexual and medical history a full physical examination was performed and blood was taken routine blood tests, blood sugar level, liver function tests, serum testosterone and prolactin levels. We are using Intracavernosal Prostaglandin (Caverject) since last few years 2003, and present the experience of results from 42 patients selected on the follows:

- Previous failed response to papaverine and phentolamine
- History of priapism after the intracavernosal use of papaverine plus phentolamine.
- History of serious ischemic heart disease.

Fig 1



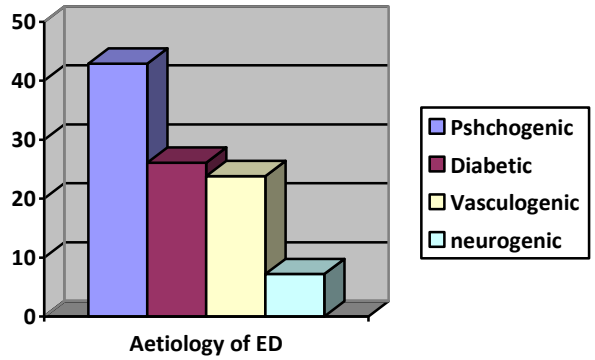
Intracavernosal injection of 10ug of prostaglandin (Caverject) was given with a fine bore needle (26 G) into the lateral aspect (10 o' clock) of one the corpora cavernosum at 1-2 cm proximal to the mid shaft. The drug was supplied in 1 ml ampoules containing 10ug prostaglandin. The initial dosage was 10ug with appropriate titration according to response up to a maximum of 30ug.

Once an erection sufficient for sexual intercourse was achieved the patient was put on the regimen for the next follow up. The injection was not administered more than twice per week. The patient attended on a regular basis to monitor effectiveness, side effects .The non responders were further investigated for other options.

RESULTS

Forty two patients satisfied the criteria for treatment between 2008-10. The mean age was 52.5 years (range 25-74) and a mean duration of impotence of 3.7 years (range 6 months - 14 years). The etiology was organic in 44 cases, psychogenic in 3 cases and uncertain in three cases (Graph1). Five patients had had previous episodes of priapism.

Graph 1



Thirty three patients (78.6%) achieved an erection which patient described sufficient for sexual intercourse. Nine (21.4%) failed. The mean follow up for responders was 3.8 months. In those treated successfully the average dose was 14ug (range 2.5ug-30ug).The average duration of erection being 65 minutes (range 20 minutes – 3.5 hours). Of the original 42 patients with a satisfactory response 29 are still attending and regularly using injection therapy after a mean follow-up period of 4.9 months (range 1-10 months) and 13 patients did not come for follow up. Five (11.5%) patients complained of local pain. The etiology of erectile failure in these cases was vasculogenic in 5, diabetic in 2 and neurogenic in 2.There is no case of priapism or significant fibrosis.

DISCUSSION

Papaverine hydrochloride was initially the most often used medication. Papaverine injections relax the muscle cells present in the arterial wall, causing dilation and increased blood flow in the penis. Several researchers have also noted that a second Papaverine injection reduces the blood flow out of the penis, so that the blood is trapped and the erection is maintained. Phentolamine (Regitine) blocks the nerves that signal the arterial muscle wall contraction. Thus, the muscle cells in the arterial wall relax and the artery dilates when the nerves are blocked. This action compliments the action of Papaverine, and the two drugs are usually mixed together prior to injection.

Prostaglandin is a chemical that occurs naturally in the human body. Discovered approximately 30 years ago, it is a very potent vasodilator. Similar to the effect of Papaverine, Prostaglandin causes the relaxation of the muscle cells of the arteries in the penis, resulting in an erection. It produces erections sufficient for sexual intercourse in 68-86% of patients in unselected series5'9'10.The response rate is highest in those of psychogenic and neurogenic origin, 7,8 reaching almost 100% in some series 7, 8. A significantly lower rate of positive response occurs in cases of vasculogenic or diabetic impotence. Our own series was a selected group in terms of aetiology in that failure to respond to papaverine plus phentolamine tended to favour patients with a vasculogenic aetiology and this subgroup formed 60% of the total patient population. The aetiological diagnosis was presumptive on the basis of the clinical history, the presence of coexisting or previous significant medical conditions and thorough physical examination. In diabetic cases, both vasculogenic and neurogenic components are commonly present. The idiopathic group was patients in whom no overt organic risk factor for erectile dysfunction could be identified. In our study the response rate of 78.5% demonstrates the superior efficacy of prostaglandin. In the nine cases where treatment was unsuccessful the presumed aetiology was vasculogenic in five, diabetic in two, neurogeinc two.

Cavernous use of papaverine causes priapism and significant penile fibrosis at the site of injection. The 2 agent solution (papaverine plus phentolamine), even with effective low dosage of papaverine, priapism and fibrosis remains the major untoward effects.

Prostaglandin is partially metabolized by the cavernous tissue, and most of it is eliminated in a single passage through the lungs and this rapid elimination is responsible for its near zero systemic side effects.

Most of the studies have shown a significant absence of priapism or fibrosis 5, 8, 9. Some authors, however, have documented priapism requiring treatment with metaraminol 10, the most vulnerable group being those with non-vasculogenic aetiology. Priapism of up to 11 hours has also been described where spontaneous detumescence ultimately occurred 6 1O. In our study, there was no case of priapism and this may be related to the selection of patients with vasculogenic disease. Corporeal fibrosis and fibrotic thickening of the tunica albuginea have been reported with papaverine injections and may be related to a number of factors including repetitive needle trauma, organization of haematomas associated with vascular puncture, or a local toxic reaction to papaverine solution which is of low pH 1316. We found no cases of corporeal fibrosis. In previous studies the most commonly described side effect of prostaglandin is localized pain in the penis, varying in intensity from mild discomfort to a severe burning sensation prohibiting sexual intercourse. The reported incidence varies from 11% up to 75% 6-10, but was a complaint in only five patients (11.5%).

CONCLUSION

Intracavernosal prostaglandin is an effective and safe alternative agent for the treatment of erectile dysfunction with particular application to those patients where treatment with papaverine and phentolamine had been ineffective with side effects.

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