The role of intracavernosal vasoactive agents to overcome impotence due to spinal cord injury

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Twenty-two spinal cord injured men (mean age 35.2 years) referred because of impotence were treated with intracavernosal vasoactive agents. Papaverine 2–20 mg, papaverine 40 mg plus phentolamine 0.5 mg or prostaglandin E₁ (1–20 µg) were used. Nineteen responded and were taught to self administer the medication with varying degrees of assistance from their partners. Fourteen men participated in a postal survey; 12 (86%) continued to use the drugs every 1 to 4 weeks and reported satisfaction with the method. Partner responses were positive in half of the group and when not so it influenced the patients to abandon or reduce the frequency of treatment. Counselling was essential to allay anxiety. Clinical management was not compromised and side effects were minimal. Overall we found this treatment effective, safe and worthwhile.

Key words: impotence; spinal cord injuries; intracavernosal injections; prostaglandin E₁; papaverine.

Introduction

Until recently the only treatment option available to impotent men with spinal cord lesions was the insertion of a penile prosthesis.¹ For those patients who found surgery unacceptable we set out to test the proposition that intracavernosal injections^{2–5} and the self injection technique⁶ is a viable alternative. The use of this technique for spinal cord injured men has been previously reported.^{7–11} We report our experience of the outcome, complication rate and patient acceptance of this treatment.

Methods

Between August 1984 and June 1990, 1361 impotent patients received more than 3258 intracorporeal injections with a variety of vasoactive agents. Of these patients, 22 were spinal cord injured referred for evaluation of their impotence. The patients were assessed clinically and biochemically as de-

scribed previously¹² and then offered intracavernosal injections. This procedure had been approved by the University of Western Australia Human Rights Committee and all patients signed a consent form.

Patients were placed supine or in a sitting position on an examination couch or were treated in their wheelchairs during and for 30 minutes after the injection. Systemic blood pressure was recorded as a baseline in case of any change in blood pressure. The right side of the penis about 4 cm from the glans was cleaned with an alcohol swab. The needle (13 mm × 26 gauge) was inserted up to the hub and the drug was injected over about 5 seconds.

It had been our usual practice when administering papaverine to give an initial injection of 20 mg (30 mg/ml). As we observed that spinal cord injured patients were very sensitive to the drug the starting dose was revised to range from 2 mg to 5 mg. Depending on the result of the initial injection, the dosage was varied with the aim of producing an erection suitable for intercourse, lasting for at least half an hour.

The maximum dose of papaverine administered was 80 mg. If the patient failed to respond to papaverine then a mixture of papaverine 40 mg and phentolamine 0.5 mg was used.

During the study reports of cavernosal fibrosis were published^{13,14} and the efficacy of prostaglandin E₁ was discovered.^{15,16} We therefore included prostaglandin E₁. As little as 1–2 µg was often adequate to produce a full erectile response. Of the 22 patients treated, 19 had full erections. These 19 patients were then invited to learn the self injection technique. All did so. The 3 remaining patients elected to have no further treatment.

Patients were instructed to draw up the drugs aseptically and to inject them into the lateral aspect of the penis. It was emphasized that the corpus spongiosum and the dorsal neurovascular bundle should be avoided. Upon withdrawal of the needle the patients were instructed to massage the penis for about 3 minutes to distribute the drug bilaterally throughout the penile shaft. During the second lesson the patients were required to demonstrate their competence at drawing up and self injection. Patients and their partners needed only 2 supervised lessons before they could be given the apparatus to use at home. They were supplied with a kit containing instructions, the drug, syringes, alcohol swabs, 19 gauge needles for drawing up and 26 gauge needles for injection. Patients were warned of the complications of the treatment and a 24 hour on call emergency medical service was made available. All 19 patients were invited to take part in the survey. Fourteen patients did so.

Results

The mean age of the 14 survey participants was 35.2 years (range 20–45) and the mean age of onset of the spinal lesion was 27 years (range 15–42). The levels of the lesions causing paraplegia and tetraplegia are listed in Table I. Eight men had upper motor neurone bladder dysfunction, 4 had lower motor neurone dysfunction and 2 complained of frequency and urgency.

Twelve of the 14 (86%) continue to use

Table 1 Spinal lesion

Paraplegia				Tetraplegia			
Complete level	n	Incomplete level	n	Complete level	n	Incomplete level	n
T5	1			C5	1	C6	1
T8	2			C7	1		
T11	2	T10	1				
T12	1	T12	1				
L1	2						
S1	1						

the self injection technique from once a week to every 1–4 weeks. Eight patients used papaverine, one a combination of papaverine and phentolamine, and 3 used prostaglandin E₁. The erections lasted for one to 4 hours. Eight patients felt that their spontaneous erections improved whilst using the self injection technique. Five patients had unreliable spontaneous erections; 3 of these patients could have intercourse occasionally without resorting to the medication. Pain had been experienced by 2 patients only, one using papaverine and the other injecting papaverine and phentolamine.

Problems experienced by these patients included lack of confidence, blood in the urethra, prolonged erections and bruising.

The patients were asked if they would prefer an alternative form of treatment. Their responses were as follows: 4 said no, 3 wondered what else was available, 2 wanted a non injectable drug, one wanted a better injection technique, or a topical ointment and one sought sexual counselling.

The partners' subjective responses to the treatment were: it was 'good' (n = 4), 'improved their relationship' (n = 2), it was 'okay' (n = 2), 'successful' (n = 1), 'apprehensive' (n = 1), 'not willing' (n = 1), 'glad it was not required every time' (n = 1). The 2 patients who had stopped using the technique did so because of 'my partner's disapproval'. Of these one patient has requested an implant and the other has not sought further treatment.

Conclusions

Intracavernosal injection of vasoactive agents has been a most important advance in

the management of impotence.^{2-5,16} This applies particularly to those who have had spinal injuries. Indeed these men are exquisitely sensitive to the drugs, requiring as little as 5% of the usual dose.

Papaverine was used initially in this study but reports of cavernosal fibrosis in clinical and animal studies led us to restrict its use.^{13,14} Currently we use it for those travelling overseas as the customs restrictions are minimal compared to prostaglandin E₁ and, unlike the latter, it is stable at room temperature. Not all patients experience a positive response to the drug and after the dose has been steadily increased to a maximum of 40 mg we have added phentolamine.⁴ This synergistic combination appears to rectify the biochemical lesion at 2 sites by direct relaxation of smooth muscle and alpha₂ adrenergic receptor blockade.

Prostaglandin E₁^{5,15,16} has the advantage of being an endogenous substance with a shorter half life which is less likely to induce prolonged erections. It must be refrigerated at 4°C, it has a shelf life of about 3 months and is more expensive than papaverine. Nonetheless the erectile response is more

reliable than papaverine.

Aside from the difficulties inherent in a pharmacological agent, other problems occur in such couples. Unrealistic expectations of this treatment by the men involved included the resumption of normal sexual gratification. Likewise, their wives may aspire to pre-accident sexual activity. Conversely, in relationships commenced after the injury the woman may be a reluctant participant in sexual intercourse. Psychological factors of this nature highlight the subjective quality of information derived from the questionnaire.

Despite the reservations expressed, the majority of patients (86%) found the treatment acceptable. It helped restore self confidence and the sustained erections allowed adequate intercourse despite the physical disability. This led to a greater sense of well being, improved self confidence, and improvement in the relationship between patient and partner.

In conclusion, we have found this pharmacological approach to impotence in spinal injury patients remarkably effective, well accepted and quite safe.

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