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ORIGINAL RESEARCH

PRIAPISM

The Hemodynamic Effects of Intracavernosal Phenylephrine for the Treatment of Ischemic Priapism

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ABSTRACT

Aim: We sought to evaluate whether the administration of phenylephrine (PE) at concentrations higher than those described in guidelines resulted in any significant changes in vital signs or impacted outcomes.

Methods: After receiving institutional review board approval, we retrospectively reviewed the charts of patients presenting to our emergency department between May 1, 2014, and August 15, 2016, using *International Classification of Diseases, Ninth Edition* and *Internation Classification of Disease, Tenth Edition* diagnosis codes for priapism. Treatment was reviewed, including corporal aspiration/irrigation, injection of PE, and shunt procedures. Vital signs were compared before and after treatment with PE. Baseline variables were explored with categorical data analysis (chi-squared tests, *t*-tests, and Mann-Whitney nonparametric tests). Where feasible, linear regression was used to evaluate outcomes.

Main Outcome Measure: Detumescence and changes in blood pressure and heart rate.

Results: We identified 74 different patient encounters of acute priapism. The median age was 36.5 years (interquartile range [IQR] = 27−47), and the median time to presentation was 5.4 hours (IQR = 4.0−9.6). 62 percent of cases were due to drug-induced priapism. In 58 (74%) encounters, patients received PE. The median dose of PE given was 1000 μg (IQR 500−2,000). Univariate regression found no association between PE dose and change in patient heart rate or blood pressure. A statistically significant decrease in heart rate (HR) (−4.2 BPM), systolic blood pressure (BP) (−1.8 mm Hg), and diastolic BP (−5.4 mm Hg) was noted. Fifty-three of 58 (91%) patients receiving PE experienced detumescence at the bedside, 2 required shunting in operating room, and 3 refused treatment and left against medical advice. No adverse events occurred.

Conclusion: We frequently treat patients with high doses of PE and seldom notice adverse effects, typically resulting in resolution of priapism without any additional procedures. Careful administration of high doses of intracavernosal PE in patients presenting with priapism does not appear to significantly affect heart rate or blood pressure and may help prevent further ischemic damage and achieve detumescence effectively and efficiently. **Sidhu AS, Wayne GF, Kim BJ, et al. The hemodynamic effects of intracavernosal phenylephrine for the treatment of ischemic priapism. J Sex Med 2018;15:990−996.**

Key Words: Priapism; Ischemic Priapism; Phenylephrine; Conservative Management

INTRODUCTION

Priapism, though an infrequent condition, is considered a medical emergency. Overall, it has an estimated incidence of 1.5 per 100,000 person-years.[1] Defined as an erection lasting more than 4 hours, priapism can be categorized as ischemic or non-ischemic.[2] Ischemic priapism (IP) is the most common, accounting for more than 95% of cases.[2] Stuttering priapism is described as recurrent episodes of IP, with intervening periods of detumescence.[2,3] It is possible that the incidence of IP is increasing because of the increased availability of vasoactive medications for erectile dysfunction, especially injectable agents, and recreational use by men without preexisting erectile dysfunction (ED).[1,4]

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Regardless of cause, IP risks permanent ED and corporal fibrosis, necessitating prompt intervention.[5,6] Current American Urological Association (AUA) and European Association of Urology (EAU) guidelines recommend using a stepwise approach to manage IP that includes corporal aspiration (with or without irrigation) and intracavernous injection of sympathomimetic agents prior to more invasive procedures such as distal and proximal shunts.[3,7] The EAU guidelines also note that aspiration can be replaced by initial injection of a sympathomimetic agent in cases of drug-induced priapism caused by intracavernosal injection (ICI) of vasoactive medications.[7]

Historically, the use of various sympathomimetic agents has been studied for the treatment of IP, including epinephrine, norepinephrine, phenylephrine (PE), metaraminol, and ethylephrine.[3,7–9] Oral agents such as terbutaline and pseudoephedrine have also been studied, although they demonstrate minimal efficacy in the treatment of IP and the AUA guidelines recommend against their use.[3] The AUA and EAU guidelines recommend PE as the intracaversonal sympathomimetic agent of choice, because of its minimized risk of cardiovascular adverse effects as an alpha-1 selective adrenergic agonist.[3,7] However, there are known side effects that must be monitored for, including but not limited to acute hypertension, reflex bradycardia, tachycardia, palpitations, and headache.[3] In a recently published survey of urology providers from the United Kingdom, 98.1% of respondents reported themselves as confident with corporal aspiration; however, only 88.7% of respondents reported themselves as confident with intracavernosal PE injection.[10] In addition, nearly 30% of respondents were not aware of existing guidelines on the management of priapism.[10]

At our institution, we treat a large number of patients for IP, frequently performing intracavernosal injection of PE with close monitoring of vital signs. We anecdotally found that our emergency room and urology providers were administering doses of PE above guideline recommendations. Therefore, we hypothesized that intracavernosal injection of high concentrations of PE (those higher than guideline recommendations) did not result in any clinically significant change in hemodynamics or have any major adverse effect on outcomes.

METHODS

Patient Population

After institutional review board approval, we retrospectively reviewed the charts of patients presenting to our emergency department between May 1, 2014, and August 15, 2016, using *International Classification of Disease, Ninth Edition* and *International Classification of Diseases, Tenth Edition* diagnosis codes for priapism, the chosen dates coinciding with the initiation of a urology residency training program at our institution. Data were abstracted from the electronic medical record into a secure Microsoft Excel file by 3 of the authors (A.S., G.W., and B.K.). Exclusion criteria included cases without documentation of PE dose administered, as well as cases without documentation of vital signs. We identified patients presenting with IP and analyzed their baseline characteristics, treatment, hospital course, and hemodynamics before and after intervention. During the study period, there were no patients identified who presented in the emergency department with stuttering priapism or non-ischemic priapism.

Baseline characteristics included age, baseline ED, body mass index (BMI), marital status, sexual orientation, race, local residence (within 50 miles of our institution), smoking history, history of alcohol use, history of recreational drug use, and cardiovascular comorbidities. Also abstracted from chart review were prior episodes of priapism, the cause of the current episode of priapism, and the duration of the priapism (defined as time between development of erection and presentation in the emergency department). Patients were treated by emergency department providers or by urology department personnel.

Treatment and Outcomes

All patients had been counseled on the risks of permanent ED and corporal fibrosis if priapism was left untreated. Written and verbal consent was obtained from patients before corporal injection/aspiration/irrigation.

Treatment involved injection of PE with or without corporal aspiration and irrigation. PE was administered in 500-μg/mL doses every 3 to 5 minutes while patients were on BP and electrocardiography (EKG) monitoring. If PE was administered without corporal aspiration, it was injected at the lateral midshaft using a 31-gauge insulin needle. Corporal aspiration and irrigation procedures were performed by first administering a penile block with 1% lidocaine solution and by inserting a needle at the midshaft or through the glans for aspiration and irrigation. Success was defined as complete detumescence. If the bedside procedure was initially successful, patients were monitored in the emergency department for at least 1 hour to evaluate for retumescence. Urology department personnel typically performed corporal aspiration/irrigation/injection procedures for up to 1 hour before considering more-invasive measures. Al-Ghorab shunt procedures were performed in the operating room (OR) for refractory cases of priapism. All patients' HR and BP were monitored during treatment; preinjection and postinjection of PE vital signs were documented. Baseline variables were explored with chi-squared tests, paired and unpaired *t*-tests, and Mann-Whitney non-parametric tests. Where feasible, linear regression was used to evaluate outcomes.

RESULTS

Patient Population

We identified 74 different patient encounters of IP during the study period. The median age of patients at presentation was 36.5 years (interquartile range [IQR] = 27–47 years), and the median time to presentation was 5.4 hours (IQR = 4.0–9.6 hours).