JOGM
Journal of Global Medicine

CASE REPORT

Refractory ischaemic priapism following the concomitant use of Viagra and cocaine: a case report

Jomo Kugblenu[1], Edore Idedevbo[1], Eric Eche[1], Mahmoud Eltawagny[2] and Adedapo M. Adesokan[1]*

[1]Emergency Dept. Kingsmill Hospital, Sherwood Forest Trust, Sutton-In-Ashfield, UK; [2]Emergency Dept. Pinderfields Hospital, Mid Yorkshire Trust, Wakefield, UK

Abstract

***Introduction*:** Ischaemic priapism is a urological emergency which drugs, sickle cell disease, haematological dyscrasias, and neoplastic syndromes may cause. We report a case of a 48-year-old male who presented with refractory ischaemic priapism following the concomitant use of recreational Viagra and cocaine.

***Case Report*:** A 48-year-old man presented to the Emergency Department (ED) with painful sustained priapism for 24 h, following Viagra and cocaine usage. Initial treatment of ejaculation and cold compresses did not help at home for 24 h. At a presentation in the ED, there was failed penile aspiration and injection of sympathomimetic, intracavernosal adrenoceptor agonist Phenylephrine was to little effect. Penile blood gas showed evidence of ischaemic priapism. The patient was transferred to a tertiary centre, where he underwent a penile aspiration, injection of further sympathomimetic, and corpora-spongiosum shunting under GA. Once back at the ward, he still had recurrent priapism. He was informed that he will have permanent damage and will need a penile implant. He was discharged and sent home with Co-amoxiclav and codeine, with a Urology outpatient follow-up in 4 weeks. Eventually, the patient underwent penile implantation, which 6 weeks later was complicated by penile abscess and required incision and drainage. This case report highlights the dangers of refractory ischaemic priapism following the concomitant use of recreational Viagra and cocaine.

Concomitant drug abuse puts the patient at risk of full or partial penectomy, owing to possible failure of first-line management steps due to the propensity of cocaine to cause refractory priapism. Mechanisms of action of the drugs were described in this case report.

Keywords: *refractory ischaemic priapism*; *Viagra*; *cocaine*

Received: 16 August 2024; Accepted: 4 September 2024; First Published Online: 4 September 2024; Published: 14 October 2024

Priapism, otherwise known as persistent erection, can be categorised as ischaemic when the corpora cavernosa is markedly rigid despite little or no cavernous arterial inflow, or non-ischaemic when due to high blood flow [1, 2]. Ischaemic priapism accounts for over 95% of cases and is a urological emergency that can ultimately lead to penile hypoxia, hypercapnia, glucopenia, and acidosis [2]. Urgent intervention is required to prevent irreversible damage, such as smooth muscle necrosis, corporal fibrosis, and the development of permanent erectile dysfunction [3, 4].

Causes of ischaemic priapism include drugs, sickle cell disease (SCD), haematological dyscrasias, and neoplastic syndromes. Most cases of drug-induced priapism are due to antipsychotics, alpha-adrenergic antagonists, and antiepileptics such as Lamotrigine with the concomitant use of antipsychotics [5]. Phosphodiesterase Type 5 Inhibitors (PDE5Is) such as sildenafil (Viagra), vardenafil (Levitra and Staxyn), tadalafil (Cialis), and avanafil (Stendra) are also notable causes, though rare [6]. Additionally, recreational drugs such as heroin, cocaine, marijuana, methadone, synthetic drugs, anabolic steroids, and excessive alcohol intake are also well-known causes of priapism [1].

Case report

A 48-year-old man self-presented to the emergency department (ED) with a 24-h persistent painful erection at about 22:00 on Monday night. He declared taking 50 mg of pharmacy-bought Viagra on Sunday at 22:00 and later also disclosed having used intranasal cocaine at 23:00 (he denies mixing it with other substances). It should be noted

*A pre-peer-review preprint was stored online at Authorea server.

that Cocaine's half-life is about 0.7–1.5 h with the terminal elimination phase of cocaine metabolites with half-life estimates ranging from 14.6 to 52.4 h [7], whereas Viagra's elimination half-life was reported as 3–5 h [8].

His first erection occurred on Monday morning, having self-ejaculated twice with no relief. He attempted cold compression at home. Despite, his persistent painful erection, he was still able to pass urine and he felt well in himself. Avious sinusitis and otitis externa, he denies any significant past medical history. He is a non-smoker; he takes no regular medications. He had no prior history of priapism. He occasionally drinks alcohol and snorts cocaine recreationally.

On examination, he had a painful, rigid erection. The remainder of the examination was unremarkable. His observations were stable. He was referred to the Urology Registrar, who came to review the patient in the ED. The patient's full blood count, CRP, clotting, liver function tests, and kidney function tests were normal. The urology registrar advised penile cavernosal arterial blood aspiration, blood gas analysis, and ultrasound ideally. Penile blood gas showed: pH 6.8, PCO2 13.9, PO2 1.7, K+ 8.9, glucose <0.2, lactate 10.9, Hb 177, HCO3 53 – indicating ischaemic priapism. Multi urine dip panel tests drug kit test (Abbott Toxicology Limited) revealed the presence of cocaine in the urine sample.

Following the penile blood gas, the urology registrar came to review the patient in the ED and commenced phenylephrine injection into the penis. A total of 10 mL of 0.1 mg/mL phenylephrine was given in divided doses with no success. Penile aspiration of 100 mL of blood was attempted but failed to stop the priapism episodes. The patient was transferred to another tertiary hospital with a Urology department for continuing care. He was taken to the theatre 36 h after the onset of symptoms, where repeat penile aspiration, injection of further phenylephrine, and eventually corpora-spongiosis Winter shunt with 2 × 14 gauge cannulas under general anaesthesia (GA) was attempted in the theatre. Intraoperatively, excellent de-tumescence was achieved. Unfortunately, despite all of the interventions attempted, he continued to have recurrent priapism and so would require a semi-rigid penile implant. He was sent home on a 10-day course of oral Co-amoxiclav and codeine for 5 days. Follow-up was conducted in the urology clinic for malleable penile prosthetics counselling. Four weeks later, he had a penile implant fitted and was discharged on a day course of oral co-amoxiclav, paracetamol as required, Naproxen, and Oramorph. Six weeks later, he re-presented to the ED with dysuria and penile abscess; this was drained via incision and drainage. He was discharged with a 5-day course of oral Co-amoxiclav. This case report emphasises the dangers of refractory ischaemic priapism following the concomitant use of recreational Viagra and cocaine.

Discussion

In this case, the patient's ischaemic priapism was due to a combination of recreational Viagra (PDE5I) and cocaine. Phosphodiesterase Type 5 Inhibitors (PDE5Is) induced priapism may involve derangements of several signalling pathways in the penis, culminating in disinhibited vasodilatation of the cavernous smooth muscle by nitric oxide synthase (NOS) and Rho-associated protein kinase (ROCK) signalling, and increased oxidative stress associated with nicotinamide adenine dinucleotide phosphate (NADPH) oxidase-mediated signalling [9, 10]. Resultant hypoxia due to persistent priapism reduces PDE5 gene expression and results in excessive adenosine and up-regulation of

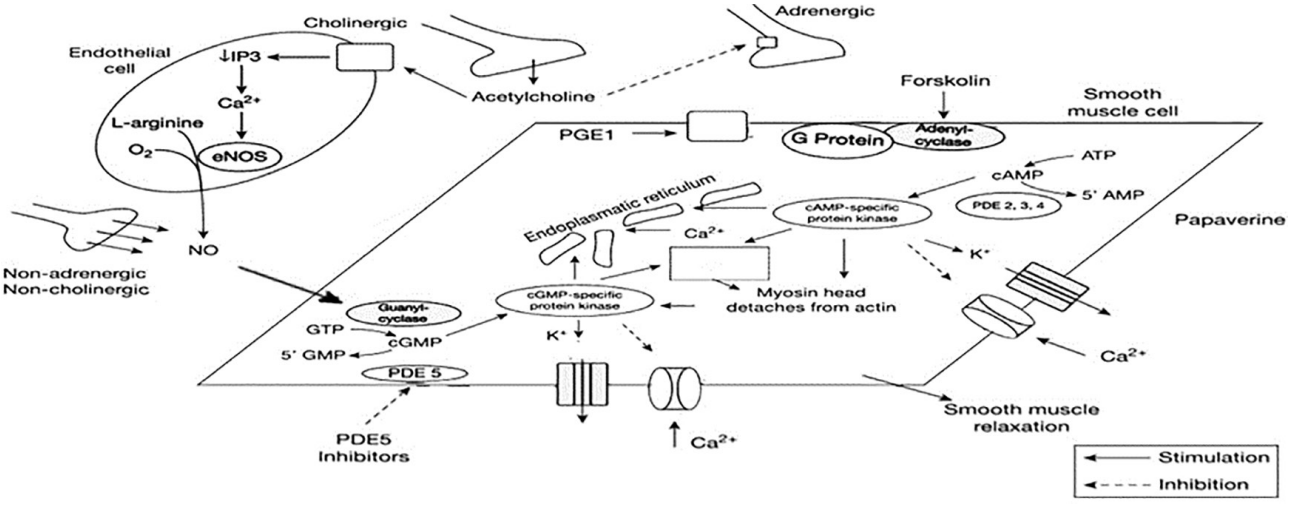

Fig. 1. Regulation of penile corpus cavernous smooth muscles [12].
ATP = adenosine triphos-phate; cAMP = cyclic adenosine monophosphate; cGMP = cyclic guanosine monophosphate; eNOS = endothelial nitric oxide synthase; GTP = guanosine-50-triphosphate; IP3 = inositol trisphosphate; NO = nitric oxide; PDE = phosphodiesterase; PGE 1 = prostaglandin E 1.

Citation: Journal of Global Medicine 2024, **4**: 235 - http://dx.doi.org/10.51496/jogm.v4.235

opiorphins. This complex pathway is illustrated in Fig. 1. This invariably impairs NO bioavailability in the penis. The longer the priapism lasts, the more is the excessive oxidative/nitrosative stress and decreased activity of the RhoA/Rho-kinase contractile pathway, resulting in worsening priapism as demonstrated in the mouse model [11].

In addition, cocaine causes vasoconstriction and impairs endothelium function, reducing the chief source of nitric oxide production and subsequently decreasing intracellular calcium mobilisation, preventing vasodilatation as demonstrated in Bovine Coronary Artery Endothelial Cells study [13]. Invariable chronic cocaine use has a contributory effect in precipitating priapism, and it can cause refractory priapism, making treatment quite challenging [14], as it was experienced in this case.

Regardless of the aetiology, refractory priapism requires immediate treatment. The stepwise management of priapism has been described in Fig. 2:

When priapism persists at home, the initial measures include exercise, ejaculation, ice packs, cold baths, and cold-water enemas [1]. Among these measures, cold water enemas successfully induce detumescence in six out of 10 cases [15]. Typically, when patients with priapism lasting more than 4 h arrive in the ED, the initial first-line management practice is usually corporal blood aspiration to drain the stagnant blood from the corporal bodies; this is to reduce compartment-syndrome-like condition within the corpus cavernosum. Some surgeons aspirate and irrigate simultaneously with 0.9% standard saline solution [16]).

Pharmacological agents such as sympathomimetic drugs or α-adrenergic agonists, otherwise known as intracavernous sympathomimetic agents like phenylephrine, epinephrine, ephedrine, epinephrine, norepinephrine, and metaraminol, resolve priapism in as much as 80% of patients [17]. When all the above medical management interventions fail, the second-line intervention is to resort to surgical intervention in the form of penile shunt surgery and penile implant insertion for refractory or delayed ischaemic priapism [18, 19].

Currently, there is limited research on the prevalence of ischaemic priapism and patient outcomes following concomitant usage of PDEI5s and cocaine. However, a similar case was reported by Grace Kunas et al. in 2020, which involved a 51-year-old-male suffering from 36 h of ischaemic priapism following a combination of an oral phosphodiesterase inhibitor and intracorporeally injected erectile medications, together with some

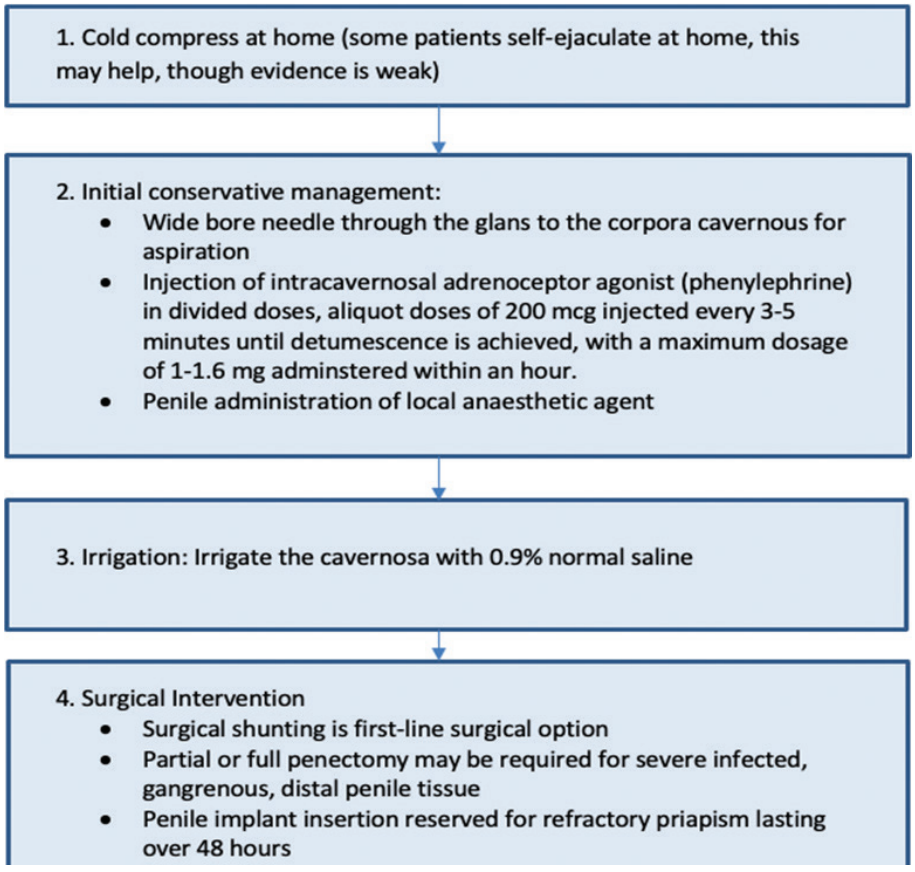

Fig. 2. Stepwise management of priapism [1, 15–19].

unspecified quantities of cocaine and alcohol [20]. In contrast to our case, this case of ischaemic priapism resolved after a corporal injection of Phenylephrine and irrigation with sterile saline, as the patient reported normal erections on day 11 of follow-up [20]. Nevertheless, clinicians should be aware that both prescribed medications and recreational drugs may lead to refractory priapism.

Conclusion

In this case report, we highlight the dangers of the use of PDE5Is with concomitant recreational use of cocaine, making the management of priapism challenging. Concomitant drug misuse puts the patient at risk of full or partial penectomy, owing to possible failure of first-line management steps due to the propensity of cocaine to cause refractory priapism.

Acknowledgements

The authors thank the teams at the Kingsmill Hospital, Sherwood Forest Trust involved in managing this patient.

Author contributions

IE admitted the patient, K.J. provided the detailed history and management from the notes for the article, E.E. followed up on the outcome, A.A.M. wrote the draft and put the article together, including the pharmacology and stepwise management, E.M. was the supervising consultant who managed the patient in the ED, A.A.M. made critical revisions to the manuscript and contributed to writing the original draft. All authors were involved in the case, actively contributed to the writing, and reviewing of the article and reviewed the final draft.

Funding

None.

Ethical approval

The patient gave explicit consent to report their clinical case.

Conflicts of interest

None.

Preprint

A pre-peer-review preprint was stored online at the Authorea server.

References

1. Broderick GA, Kadioglu A, Bivalacqua TJ, Ghanem H, Nehra A, Shamloul R. Priapism: pathogenesis, epidemiology, and management. J Sex Med 2010; 7: 476. doi: 10.1111/j.1743-6109.2009.01625.x
2. Muneer A, Cellek S, Dogan A, Kell PD, Ralph DJ, Minhas S. Investigation of cavernosal smooth muscle dysfunction in low flow priapism using an in vitro model. Int J Impot Res 2005; 17: 10. doi: 10.1038/sj.ijir.3901231
3. El-Bahnasawy MS, Dawood A, Farouk A. Low-flow priapism: risk factors for erectile dysfunction. BJU Int 2002; 89: 285. doi: 10.1046/j.1464-4096.2001.01510.x
4. Zacharakis E, Garaffa G, Raheem AA, Christopher AN, Muneer A, Ralph DJ. Penile prosthesis insertion in patients with refractory ischaemic priapism: early vs delayed implantation. BJU Int 2014; 114: 576. doi: 10.1111/bju.12686
5. Rezaee ME, Gross MS. Are we overstating the risk of priapism with oral phosphodiesterase type 5 inhibitors? J Sex Med 2020; 17: 1579. doi: 10.1016/j.jsxm.2020.05.019
6. Baños JE, Bosch F, Farré M. Drug-induced priapism its aetiology, incidence and treatment. Med Toxicol Adverse Drug Exp 1989; 4(1): 46–58. doi: 10.1007/BF03259902
7. Jufer RA, Wstadik A, Walsh SL, Levine BS, Cone EJ. Elimination of cocaine and metabolites in plasma, saliva, and urine following repeated oral administration to human volunteers. J Anal Toxicol 2000; 24: 467–77. doi: 10.1093/jat/24.7.467
8. Eardley I, Ellis P, Boolell M, Wulff M. Onset and duration of action of sildenafil for the treatment of erectile dysfunction. Br J Clin Pharmacol 2002 53: 61S–5S.
9. Musicki B, Ross AE, Champion HC, Burnett AL, Bivalacqua TJ. Posttranslational modification of constitutive nitric oxide synthase in the penis. J Androl 2009; 30(4): 352–62. doi: 10.2164/jandrol.108.006999
10. Bivalacqua TJ, Champion HC, Usta MF, Sellek C, Chitaley K, Webb RC, et al. RhoA/Rho-kinase suppresses endothelial nitric oxide synthase in the penis: a mechanism for diabetes-associated erectile dysfunction. Proc Natl Acad Sci U S A 2004; 101(24): 9121–6. doi: 10.1073/pnas.0400520101
11. Bivalacqua TJ, Musicki B, Hsu LL, Berkowitz DE, Champion HC, Burnett AL. Sildenafil citrate-restored eNOS and PDE5 regulation in sickle cell mouse penis prevents priapism via control of oxidative/nitrosative stress. PLoS One 2013; 8(7): 1–8. doi: 10.1371/journal.pone.0068028
12. Hatzimouratidis K, Salonia A, Adaikan G, Buvat J, Carrier S, El-Meliegy A, et al. Pharmacotherapy for erectile dysfunction: recommendations from the fourth International Consultation for Sexual Medicine (ICSM 2015). J Sex Med 2016; 13: 465–88. doi: 10.1016/j.jsxm.2016.01.016
13. Jiale He J, Yang S, Zhang L. Effects of cocaine on nitric oxide production in bovine coronary artery endothelial cells. J Pharmacol Exp Ther 2005; 314(3): 980–6. doi: 10.1124/jpet.105.087452
14. Altman AL, Seftel AD, Brown SL, Hampel N. Cocaine associated priapism. J Urol 1999; 161(6): 1817–8. doi: 10.1016/S0022-5347(05)68812-X
15. Bansal AR, Godara R, Garg P. Cold saline enema in priapism – a useful tool for underprivileged. Trop Doct 2004; 34: 227. doi: 10.1177/004947550403400414
16. Ateyah A, El-Nashar AR, Zohdy W, Arafa M, El-Den HS. Intracavernosal irrigation by cold saline as a simple method of treating iatrogenic prolonged erection. J Sex Med 2005; 2: 248. doi: 10.1111/j.1743-6109.2005.20235.x
17. Burnett AL, Sharlip ID. Standard operating procedures for priapism. J Sex Med 2013; 10: 180. doi: 10.1111/j.1743-6109.2012.02707.x

18. Burnett AL. Surgical management of ischaemic priapism. J Sex Med 2012; 9: 114. doi: 10.1111/j.1743-6109.2011.02446.x
19. Ralph DJ, Garaffa G, Muneer A, Freeman A, Rees R, Christopher AN. The immediate insertion of a penile prosthesis for acute ischaemic priapism. Eur Urol 2009; 56: 1033. doi: 10.1016/j.eururo.2008.09.044
20. Kunas G, Smereck JA, Ladkany D, Davis JE. Pharmacologically induced recreational priapism: case report and review. Clin Pract Cases Emerg Med 2020; 4(4): 591–4. doi: 10.5811/cpcem.2020.8.47763

***Adedapo M. Adesokan**
Emergency Dept. Kingsmill Hospital,
Sherwood Forest Trust,
Sutton-in-Ashfield, UK
Email: Adedapo.Muideen@nhs.net