Case Report

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Role of Phenytoin in Fournier's Gangrene

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Abstract

Fournier's gangrene or idiopathic gangrene of the scrotum has a fulminant course if not identified and managed at the earliest possible. The main stay of treatment is intensive care along with thorough surgical debridement and culture sensitive antibiotics. Multimodality treatment is advised as it hastens the wound healing, thereby shortening the patient stay in the hospital and thereby decreasing the patient mortality and morbidity. We hereby share our experience in managing a case of Fournier's gangrene using topical phenytoin as an adjunct for wound-bed preparation.

Keywords: Phenytoin; Fournier's gangrene; Wound-bed

Introduction

Fournier's gangrene (FG) is a synergistic polymicrobial necrotizing fasciitis of the perineum, scrotum and penis which is portrayed by obliterative endarteritis of the subcutaneous arteries, bringing about gangrene of the subcutaneous tissue and the overlying skin.[1] Despite the fact that the reason is believed to be idiopathic, it is mostly observed in alcoholic patients, or patients with diabetes or those with idiopathic immunocompromised patients.[2] It was first portrayed by Jean Alfred Fournier, a French dermatologist in 1883 as a "fulminant gangrene" of the penis and scrotum.[3] Different terms that were utilized to depict the infection were 'idiopathic gangrene of the scrotum', 'peri-urethral phlegmon', 'streptococcal scrotal gangrene'and 'phagedena'.

The origin of the disease might be either through the anorectal skin or genitourinary tract. Numerous patients present with a spontaneous necrotic patch which quickly advances to Fournier's gangrene which can expand up to the abdominal wall. The mainstay in the management of Fournier's gangrene remains extensive debridement and wound bed preparation, trailed by tissue cover. Early diagnosis is basic to maintain a strategic distance from mortality and morbidity of this condition. Different strategies have been depicted as an adjunct to the management of Fournier's gangrene. In our investigation, we are depicting topical phenytoin as a supplement for debridement in wound-bed preparation.

Case Report

Sixty-six year-old gentleman hailing from Tamilnadu, driver by occupation, a known case of diabetes and hyperthyroidism, presented to us with history of necrotic patch over the right hemiscrotum following surgery for hydrocele, which was done 6 days ago. On admission, the patient's general condition was fair, he had toxic features, febrile. Necrotic patch with swelling over the right hemiscrotum was noted, which was tender. Fournier's gangrene severity index was 10, which showed a morbidity and mortality index was 75%.

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Clinical diagnosis of Fournier's gangrene was made and emergency debridement of the patch was done, which exposed sloughed out skin of the hemi-scrotum, and slough and pale granulation tissue over the testis (Fig. 1). The initial Bate-Jensen score of the wound was assessed to be 38. Following surgical debridement, topical phenytoin was used (Fig. 2). Injection phenytoin (50 mg/ml) solution was diluted using normal saline (0.9% NaCl) to prepare a phenytoin solution (5 mg/ml). Serum phenytoin concentration was monitored regularly in the department of clinical pharmacology, JIPMER, and it was always below 0.4 Mg/ml, indicating only minimal absorption of phenytoin systemically. No local or systemic adverse effects of phenytoin were observed during the course of the treatment.

Fig. 1: Fournier's gangrene at initial presentation.

Fig. 2: Topical phenytoin being sprayed over the wound post-surgical debridement.

Fig. 3: Scrotal wound after 20 days (7 applications) of topical phenytoin.

Over 20 days, after 7 applications, the wound improved drastically and the scrotal wound was closed primarily (Fig. 3).

Discussion

The cornerstone in the treatment of Fournier's gangrene is intensive care alongside proper surgical debridement pursued by broad spectrum anti-microbial. In any case, this takes a more extended span, prompting expanding costs for the patient's relatives. Consequently innovative techniques which can be utilized as a subordinate to fasten the healing process have been introduced. Those constitute low level laser therapy, autologous platelet rich plasma infusion, insulin therapy and Phenytoin application.

Though commonly described in diabetic foot ulcer management, the literature on use of phenytoin in fournier's gangrene is sparse. In 1939, Kimball and Horan watched for the first time that gingival hyperplasia cropped up in certain patients who are treated with phenytoin. The earliest preliminary trail which was done in 1958 recommended that the periodontal patients with surgical wounds who were pre-treated with oral phenytoin had less inflammation, less pain, and accelerated healing when compared with control.[4]

Topical phenytoin sodium has wound healing effects credited to the accompanying components: increase in fibroblast multiplication, restraint of collagenase action, promoting granulation tissue formation, diminishes bacterial contamination, decreases wound exudate development, up-regulates growth factor receptors.

In 1991 Muthukumaraswamy et al. in their research on the effect of topical phenytoin in diabetic foot ulcers, a prospective controlled clinical trial, have utilized phenytoin powder on the ulcer base.[5] Where they presumed that utilization of phenytoin to advance healing of diabetic ulcers is both viable and safe.

Dacosta et al. in 1998 in their investigation inferred that phenytoin alters the normal course of wound healing and might be of advantage in clinical circumstances where deficient collagen deposition may prompt poor wound healing and resulting morbidity and mortality.[6] There was fibroblast expansion and neovascularization in the wounds treated with phenytoin compared with controls at day 3. By day 6, the inflammatory infiltrate had completely subsided in the treated wounds.

A randomized controlled trial in 65 patients by Shaw et al. in 2011 reasoned that there were no distinctions in diabetic foot ulcer closure rates or in diabetic foot ulcer area after some time between the two groups when phenytoin is utilized.[7] The examination by Shaw et al. was constrained by sample size.

Dutta et al.[8] were the exclusive article which portrayed the utilization of phenytoin in Fournier's gangrene, however as an aid to various techniques, and consequently resulting in wound healing.

Each study that is referenced acknowledges that phenytoin causes increased fibroblast expansion, improves granulation tissue, diminishes bacterial contamination. But Shaw et al. state that there were no distinctions in diabetic foot ulcer closure rates or in diabetic foot ulcer area over time between the two groups when phenytoin is utilized

To conclude, Our case report focuses on the upsides of phenytoin, for example, simple accessibility, cost-effectiveness, decreased side effects of treatment. Furthermore cases are required to be enlisted to evaluate and approve the viability of phenytoin in Fournier's gangrene, as only sparse literature is available on this topic.

Conclusion

To conclude, our case report focuses on the upsides of phenytoin, for example, simple accessibility, cost-effectiveness, decreased side effects of treatment. Furthermore cases are required to be enlisted to evaluate and approve the viability of phenytoin in Fournier's gangrene, as only sparse literature is available on this topic

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