

## Local Application of Propranolol and Treatment of Diabetic Vulvovaginitis

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### Abstract

**Background:** Propranolol (PRO) is a commonly used non-selective beta-adrenergic receptor antagonist used in the treatment of hypertension, angina, anxiety, cardiac arrhythmia, hyperthyroidism, essential tremor and as a prophylaxis against migraine, variceal bleeding and myocardial infarction diabetes mellitus (T2DM) is a debilitating disease with multiple complications resulting from hyperglycemia, inflammation, and possibly immune dysfunction. It is well established that yeasts thrive in a sugar-rich environment, and therefore, it is logical to hypothesize that high glucose concentrations in patients with diabetes may be responsible for promoting the occurrence and recurrence of candidiasis. There are several potential mechanisms by which hyperglycemia may facilitate vaginal candida colonization. Hyperglycemia impairs various aspects of host defense, including neutrophils and complement proteins, and also promotes the virulence of infecting organisms in patients with diabetes. To evaluate the effective of propranolol solution application in treatment of diabetic vulvovaginitis.

**Method:** Diabetic patients were diagnosed diabetic vulvovaginitis were divided into test group and control group with the method of randomized controlled trial. The patients of test group were treated with local application of propranolol solution once a day. The patients of control group were treated vaginal douch applied locally on vaginal and local on vulva once a day. The course of treatment was 10-d.

**Result:** The curative indexes included the improvement of symptoms and signs of Vulvovaginitis first pain relief, burning sensation, hotness, swelling and vaginal discharge, in group. A symptoms cures in 80%, in group B symptoms cure in 12% side effect of treatment in group A no side effect in group A nor in group B vaginal.

**Conclusion:** Propranolol application promising for the treatment of diabetic Vulvovaginitis in symptomatic women it combat symptoms.

**Keywords:** Mycoplasma; Bacterial; Hyperglycemia

### Introduction

Vulvovaginitis (VV) is a commonly encountered symptom in the diabetes clinic [1]. Many patients are diagnosed to have diabetes when they present with symptoms suggestive of VV. Others experience episode of uncontrolled or refractory hyperglycemia which can be attributed to untreated VV. Yet others may develop VV as an adverse effect of glucose-lowering medication, or as a sexually transmitted disease (STD) [2,3]. Etiology The presenting symptom of VV is usually vaginal discharge, itching and/or odour. The common etiologies are bacterial vaginosis (BV), Trichomonas vaginalis (TV), and candidiasis (CVV). BV is due to replacement of normal vaginal flora by anaerobic bacterial overgrowth, including Prevotella sp, Mobiluncus sp, G. vaginalis, Mycoplasma and Urea plasma. BV and TV can be STD, while CVV is rarely transmitted through sex [4]. Diagnosis The diagnosis of VV is made through history, physical examination, and simple laboratory tests [5]. However, it must be remembered that history alone may miss the diagnosis in a significant number of cases. Simple and economical tests, carried out in the clinic, help in correct diagnosis. Vaginal pH can be checked using pH strips. An elevated pH (>4.5) suggests BV or TV. Microscopic examination of a saline-solution specimen of vaginal discharge may reveal motile trichomonas or "clue cells" in BV. A KOH (potassium hydroxide) preparation will demonstrate hyphae or blastopores in CCV [4,6]. Culture may be

required for confirmation, and urine microscopy may provide helpful clues to diagnosis as well.

Propranolol, a non-selective  $\beta$ -blocker, is used for the treatment of hypertension and a number of other cardiovascular diseases. Recently, topical or oral propranolol has been used to treat infantile hemangioma [7-8]. Some scholars believe that oral propranolol can promote wound healing, for example in pediatric and adult burn patient [9-10]. Romana-Souza found that oral propranolol reduced local inflammatory response and improved skin wound healing in diabetic rats [11]. However, other researchers think that oral propranolol can delay wound healing. It has been reported that propranolol dissolved in drinking water delays rat wound contraction and re-epithelialization [12,13].

Propranolol inhibited motility and growth of Giardia lamblia and Trichomonas vaginalis. Farthing et al., J in his study because of the inhibitory effect of propranolol on sperm motility D-propranolol at about 10-3 moles/liter in a tissue culture medium inhibited motility and growth of Giardia lamblia and Trichomonas vaginalis [14]. Propranolol and anesthetic, analgesic effect panel [14] in his study propranolol as a local anesthetic is more potent than lidocaine, and the sensory/nociceptive blockade caused by propranolol was longer than that caused by lidocaine. Co-injection with propranolol markedly potentiated infiltrative cutaneous anal-gesia of lidocaine. Although it is not a replacement for lidocaine, propranolol may have value in producing a cutaneous analgesic effect following subcutaneous injection [15].

In study of Bruna Romina-Souza Propranolol administration improves cutaneous wound healing of hyperglycemic diabetic rats by reducing the local inflammatory response and improving subsequent phases of the repair process as the inflammatory cell numbers and metalloproteinase-9 levels were reduced in the propranolol-treated group compared to the control group 14 days after wounding. Cell proliferation, mast cell number, collagen deposition, blood vessel density, and nitric oxide levels were increased in the propranolol-treated group compared to the control group 14 days after wounding [16].

## Methods

This study conducted in department of Obstetrics and Gynecology at Diameter hospital (outpatient). After taking written informed consent from patient prior commencing. A total of 60 patient's diagnosed diabetic vulvovaginitis were enrolled and randomly assigned into two study groups. Group A Included 30 patients were treated locally with local applications propranolol Group B Included 30 patients were treated locally vaginal douch. women found to have diabetic vulvovaginitis were provided a course of oral and/or vaginal treatment and those who were not responsive to treatment were enrolled in study The Inclusion criteria were symptoms vaginal discharge, and vulvitis redness hotness, painful/or other signs that, if combined, were diagnosed as diabetic Vulvovaginitis. All case history were taken included personal, family history, menstrual history and obstetrics history previous history of oral contraception pills, IUCD, allergic examination general and local examination the patients were seated in the lithotomy position and received treatment, depending on the group to which they were assigned and locally applied with propranolol solution for 5 minutes The patient remained in the sitting lithotomy position for 15 minutes repeated every day for 10 days in group B Vaginal Douch were applied locally as in group A evaluation of the therapeutic effect of treatment, cure defined as improvement of symptoms and signs as pain, soreness, hotness, swelling vaginal discharge complications & side-effects were observed & recorded.

## Results

Total 60 patient were diagnosed diabetic vulvovaginitis not responsible to systemic and local treatment divided into two groups A propranolol group and group B vaginal douch group after receiving local treatment follow up patients were reviewed one week and after treatment for effective of treatment and possible side effect our results in propranolol group cure rate 80% after one week in other group cure rate 20 % cure with vaginal douch in group A anesthetic and analgesic in 80% in group B only 20%; anti-inflammatory effect in group A 70% in group B 10%, antitrichomonas effect in 50% ,no effect in group Both group vaginal discharge in group A 30 case complain of vaginal discharge 25 cases cure 83% in group B 30 cases complain of vaginal discharge only possible side effect There were no complications due to the propranolol Applications during the treatment follow-up period.

## Discussion

The aim of this study was to compare the safety and efficacy of local propranolol with the local vaginal douch in treatment of diabetic vulvovaginitis. In this study, it was show propranolol effective in treatment of diabetic vulvovaginitis and safer. In our study the patients were diagnosed diabetic vulvovaginitis not responded to general and local treatment were treated with Propranolol applied local to vagina

and vulva as local treatment has advantage over systemic treatment that increase its effectiveness and decrease side effect of treatment in this study propranolol has analgesic and anesthetic effect as patients the first symptoms to relief is soreness this agree with study Panel Yu [14] in his study that propranolol as a local anesthetic is more potent than lidocaine, and the sensory/nociceptive blockade caused by propranolol was longer than that caused by lidocaine. Co-injection with propranolol markedly potentiated infiltrative cutaneous analgesia of lidocaine. Although it is not a replacement for lidocaine, propranolol may have value in producing a cutaneous analgesic effect following subcutaneous injection [15].

Propranolol shows a local/cutaneous anesthetic effect similar to lidocaine by decreasing Na<sup>+</sup> and Ca<sup>2+</sup> influxes [17,18]. It is well established the decrease of neuronal excitability by-adrenergic receptors (i.e., propranolol) in nociception [19] based on inhibition of voltage sensitive Ca<sup>2+</sup> and Na<sup>+</sup> channels activity, decrease of intracellular AMPc [18-20] and reduction of the adenylcyclase activity [21]. In addition, -blockers are known to inhibit the phospholipase A [22] and to attenuates interleukin-6 [23] and tumor necrosis factor [24] release, all the actions are strongly linked to analgesia [25]. Others mechanism of propranolol it combat trichomonas infection and giardia evidence by improve of symptom and sign as yellowish, offensive vaginal discharge and itching this agree which study of Farthing et al., J in his study as propranolol has inhibitory effect on sperm motility so, D-propranolol at about 10-3 moles/liter in a tissue culture medium inhibited motility and growth of Giardia lamblia and Trichomonas vaginalis [14]. Another mechanism is as hyperglycemia associated neutrophilia dysfunction propranolol antagonist this effect this obvious in study of Michael Buckley R that propranolol prevented alcohol's inhibiting effect on granulocyte adherence and delivery to sites of inflammation, and significantly improved the survival of infected intoxicated animals and preservation of normal granulocyte delivery would be expected to improve the defense against bacterial infection [26]. Thus, it appears that pharmacologic manipulation of granulocyte adherence may be helpful to an infected animal's host defense against bacterial infection. It is possible that antibacterial defense might be improved by the use of adherence-augmenting drugs in other clinical situations associated with impaired adherence such as glucocorticoid therapy [27] and multiple myeloma [28].

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