

Review Article

Propranolol Application in Gynaecological Disease a Review

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Abstract

Propranolol is inhibitor of β -1 and β -2 adrenergic receptors β -adrenergic receptor blocker with reported antioxidant and anti-inflammatory properties used in treatment of hypertension, angina pectoris, myocardial infarction, migraines, anxiety disorders, and tremor but why limited used in gynecology field in spite of many action either by beta receptor block or no receptor blocker mechanism it act as anti-inflammatory anticancer inhibition Angiogenesis, antioxidant, affected apoptosis, wound healing. We discussed its known used as local contraceptive and treatment of Vulvovaginitis by inhibited motility and growth of *Giardia lamblia* and *Trichomonas vagina* and treated genital hemangioma and discussed also experimental studies on effective on polycystic ovary and in endometriosis.

Introduction

Propranolol is a drug with beta-blocker effect and used clinical in treated hypertension thyrotoxicosis, and recent in capillary hemangiomas, anxiety, and essential tremors [1]. But clinical applications in gynecology is limited and route of administration oral route, injection but what about vagina route is used only as spermicidal effect function. Propranolol is beta blocker that crosses the blood-brain barrier Propranolol and blood vessel either vasoconstriction *via* beta-adrenergic antagonists or through inhibition of NO synthesis and NO release [2]. But both action obvious in study of Sonia Maccair. Demonstrated biphasic according to dose With low dose vasoconstriction effect is obvious but with high dose vasodilation effect is dominant as regards vasodilation action alone in study of Priviero FB et al in experimental study on rat the prolonged administration of propranolol after block of nitric oxide the vasodilation action by three mechanism first mechanism gumentum of the relaxation effect of acetylcholine. Second mechanism block calcium entry into vascular smooth muscle third mechanism. Increase No bioavailability [3-8]. Propranolol could readily concentrate into the lysosomes and raise the intralysosomal pH in study of make IT et al. So has has protective effect against iron load-mediated cytotoxicity [9]. The release and uptake of iron by macrophage is Sensitive to Propranolol study by Andrei M et al result [10]. Propranolol antioxidant effect and reduces cardiac Fe uptake as well as antiinflammatory so preserve cardiac function during Fe overload [11]. Other study of antioxidant action by Dimitra Taprantzi. Propranolol reduces systemic oxidative stress and endotoxemia in cirrhotic patients with esophageal varices [12]. Propranolol inhibition of matrix metalloproteinase-2 activity by in immunocompetent cells. By study of Ftemeh Hajighasem [13], propranolol induce apoptosis [14]. Propranolol has serotonin antagonist effect [15,16].

Propranolol and Voltage-Gated Sodium Channels

Propranolol known has membrane stabilizing effect as it block sodium channel so function as local anaesthetic effect, anti arrhythmic and has central nervous system effects [17,18,19].

Application in Gynecology

Propranolol used in treatment of many diseases but used in gynecology diseases in clinical practice not mentioned in spite of many studies mentioned its multiple mechanism of action. Propranolol is the only Food and Drug Administration approved therapy for treatment of patients with hemangiomas vascular anomaly and should be considered first-line therapy for genital infantile hemangiomas.

Propranolol has analgesic and anesthetic effect

Propranolol relief pain of vaginitis and in vulvovaginitis this results obvious more in women with diabetes vulvovaginitis as in my previous study on the effect of propranolol on diabetic vulvovaginitis the first symptom is decrease soreness and pain. Anter S study agree with others study, as main complained of women with diabetic vulvovaginitis is pain and soreness [20].

Due to neuropathy and increase nerve growth factor in diabetic women which decrease by propranolol in study Panel Yu [21], propranolol acts as a local anesthetic my more potent and longer than lidocaine and producing a cutaneous analgesic effect following subcutaneous injection [22]. By decreasing Na^+ and Ca^{2+} influxes [22,23], propranolol decrease of neuronal excitability in nociception [24] by two mechanism first as mention above affected Ca^{2+} and Na^+ channels activity second mechanism is decrease of intracellular cAMP [25] and so reduction of the adenylylase activity [26], third mechanism inhibit the phospholipase A [27], fourth mechanism attenuates interleukin-6 [28], fifth mechanism affected tumor necrosis factor release [29] all the fifty actions are linked to analgesia.

Propranolol and vaginal infection

Propranolol affected motility of sperm by inhibition and used as spermicidal [30] from this mechanism affected other motile organism as trichomonas infection and guardian. Farthing et al., study [31], adds to trichomonas and giardia infection cause vaginitis and can treatment by propranolol also propranolol can combat candida albican by inhibits hyphal development affected the appearance of germ tubes by inhibition without decreasing growth rate by mechanism may be due to binding by propranolol of phosphatidic acid [32].

Propranolol and defence against bacterial infection

This obvious in study of Michael Buckley R that propranolol affected granulocyte adherence and maintain normal function [33]. This function may use on other situations associated with impaired adherence such as glucocorticoid therapy [34] and multiple myeloma [35].

Effect on vagina of rat as it applied local thickness of the vaginal epithelium was reduced by each treatment and propranolol solution caused significantly more damage than buffer alone in study of on rat Julie L, et al. [36].

As in numerous study, clarify impact of propranolol in polycystic ovary in creature think about as well as in endometriosis. So we should be said first examination on its impact in polycystic ovary in investigation of P. Silva et al clarified enhanced of pathology. With propranolol, blocking ovarian beta-adrenergic receptor was appeared to be a decent instrument to keep the beginning of PCOS actuated by thoughtful hyperactivation [37]. Propranolol and viability on endometriosis propranolol may stifle endometrial tissue by its antiangiogenic movement through inhibitory activities on VEGF, MMP-2, and MMP-9 [38].

Conclusion

Propranolol is a medication of the beta blocker type treated hypertension and others away from gynecological field and by route other than vagina route inspire of its effectiveness route and less side effect but clinical applications in gynecology is limited to spermicidal and combat infection and genital hemangioma aim of review to open eyes on possible used of Propranolol in polycystic ovary and endometriosis and pass from animals study for more studies.

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