Pathological effect of administration Norfloxacin in stomach, intestine and skin of mice

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Abstract

The experimental work of this research was contain three groups of white swiss mice, the range of body weight 20-25gm. Each group was had 10 mice. The animals were grouping and the first was administrated 5-7 mg/kg of norfloxacin daily for 14 days. The second group was given semi drug and dose for 30days twice daily by mouth, and third group as a control. This study was contain adverse pathological changes reported after the long period (14/30 days) administration of norfloxacin in stomach, intestine and skin tissue of mice.

Introduction

The Norfloxacin drug from Quinolone group 1-Ethyl -6 fluoro -1,4 dihydro –4 – oxo –7 (piperazin –1-yl) quinoline -3- carboxylic acid (C1 6 H18FN3O3) (1). Treatment with Norfloxacin given doses of 800 mg/kg reducing to 200mg/kg daily (4). In 1965 the first commercial product was nalidixic acid (first – generation Quinolone). The structural changes incorporated into these new compounds enhanced pharmacodynamic characteristics and pharmacokinetic profiles. Norfloxacin is the second-generation quinolones group. It's well absorbed in duodenum and jejunum. They have large volumes of distribution and their penetration in to different tissue and body fluids (5,6,7). The primary target of nalidixic and probably also the fluoroquinolones is inhibit the type 2 topoisomases, DNA gyraes and topoisomerase IV. as essential bacterial enzyme maintains super helical twist in DNA (3,8, 10). The most frequent adverse effects are gastrointestinal disturbances include nausea, vomiting, abdominal pain and dyspnea, pseudo membranous colitis has been reported rarely In addition to rash and pruritus, hyper sensitivity, type reaction affecting the skin have included photo-sensitivity, toxic epidermal necrolysis and anaphylaxis (10,11, 12, 13 ) and Therefore, a few studies on the pathological effects of administration of Norfloxacin in the organs of lab. animals (4,14,15 ). The aim of this study to identify the pathological effect of Norfloxacin after long period of treatment.

Materials and Methods

30 white mice were taken and reared in the animal house of veterinary medicine college Basrha university for 2 weeks period of exposure adaptation than we divided it 3 groups. The first group and the second were administrated 400mg/kg Norfloxacin as dissolved one tablet in the 35 ml of distal water for 14 days and 30 days respectively twice daily by the mouth. The third one as control group. During sacrificing period anesthesia was given intramuscularly 15mg/kg b.w. Ketamin followed by 5mg/kg b.w. xylazine. The animal was placed in dorsal recumbence and skin incision on was made the linea alba starting from the umbilicus back to the pubic region. The intestine, stomach and skin were washed with normal saline. Small pieces of these organs were fixed in 10% for 48hr. and trimmed to suitable sizes. Dehydrated ,clear and embedded in paraffin wax. Sectioned at 1 µm thickness stained with hematoxylin & eosin stain and examined by alight microscope (16 ).

Result

Macroscopic examination were carried out pruritis and redness skin noted on the face and forearms. There were congestion of blood vessels of the gastrointestinal tract wall especially in the second group (400 mg/kg b.w. of Norfloxacin for 30
days). As well as there are slight redness in the skin tissue increase it's severity in the second group. The microscopic examination reveal erosion area of mucosal layer gastrointestinal tract (figer 1,2,3), and there are infiltration of inflammatory cell.(pleomorphonuclear mainaly), in first group (figer4). (figer5) there are catarrhal enteritis in the second group which were administration with Norfloxacin for 30 days (figer6). And there are atrophy of epidermis and the dermis had infiltrated by plasma cells and eosonophil cells (figer7 ).

**Discussion**

The study was recorded the pathological changes in mice after administration of this drug by mouth {Norfloxacin (Quinolone group)}. There were pruriginous and erythematous eruptions (17,18) due to hypersensitivity reaction after administration of Norfloxacin colonisation resistance in a natural mucosa associated defence mechanism which protects against secondary colonisation of the gastrointestinal tract by non-commensal microorganisms the ecological balance of the indigenous oropharyneal and gastrointestinal microflora mostly anaerobic is subject to disturbance by the administration of antibacterial drugs leading to overgrowth of existing microorganism with natural resistance and the establishment of new resistant pathogenic species (3,4,6,19,20). These parthogenic species is resprisible for erusion in the GIT and inflammatory process characterized by infiltration of neutrophils & mononuclear cells(19). Also, there is catarrhal inflammatory lesion resulted from irritation of mucosal glands under long treatment period by Norfloxacin in the second group of mice.

![Histological section of stomach of mice, administration of Norfloxacin for 30 days. Note the sloughing of mucous layer (erosion) X10 H&E.](image)
Fig. 2. Histological section of mucous layer of mice stomach, administration of Norfloxacin for 14 days. Note erosion X 20 H&E.

Fig. 3. Histological section of intestine of mice, administration the drug for 30 days. Note Sloughing of mucous layer. For 30 days X10 H&E, X20H &E
Fig 4. Section of intestine & gastric. Note the infiltration of neutrophils and mononuclear cells in the mice administrated the drug for 14 days. X40 H&E.

Fig 5. Histological section of gastric of second group. Note the mononuclear cells infiltration in the wall. X40 H&E.
Fig 6. Histological section of intestine of second group. Note the mucinous material released along the mucosal surface of intestine by the goblet cells X20 H&E.

Fig 7. Histological section of skin of second group. Note the atrophy of epidermis and there are inflammatory cells especially mononuclear cells in the dermis X40 H&E.
Refrences


20- Huysmans , M-B. and urnidge, J-D. (1997 ). Disc susceptibility testing for thermophilic campylobacers
التأثيرات المرضية لعقار النورفلوكساسين في المعدة والأمعاء والجلد في الفئران

الخلاصة

تم تجريب (30) من الفئران البيضاء تراوح أوزانها من 20-25 غم قسمت الحيوانات إلى ثلاث مجموعات كل مجموعة تحتوي على 10 فئران حيث جرعت المجموعة الأولى والثانية 7.5 ملغ / كغم من عقار النورفلوكساسين لمدة 14 يوم وشهر على التوالي مرتين باليوم عبر الفم والمجموعة الثالثة مجموعة السيطرة. وبعد قتل الحيوانات المختبرية جرى دراسة التغييرات المرضية لنسيج معدة وأمعاء الفئران بالإضافة إلى نسيج الجلد.


المراجعات المرضية: الدراسة من خلال الفئران الزيب وحيد خضر، كلية الطب البيطري جامعة البصرة