European Journal of Pharmacology 723 (2014) 375–380

Contents lists available at ScienceDirect

European Journal of Pharmacology

journal homepage: www.elsevier.com/locate/ejphar

Pulmonary, gastrointestinal and urogenital pharmacology

Effect of local bleomycin sulfate application on seroma formation in a rat mastectomy and axillary lymph node dissection model

Mehmet Eser [a], Mehmet Gökçeimam [a], Kemal Eyvaz [a], Fırat Tutal [a], Melin Özgün Geçer [b], Selçuk Göktaş [a], Hüseyin Uzun [a], Levent Kaptanoglu [a,*], N. Kurt [a]

[a] Dr Lütfi Kırdar Kartal Training and Research Hospital, 3rd General Surgery Clinic, Istanbul, Turkey
[b] Dr Lütfi Kırdar Kartal Training and Research Hospital, Pathology Clinic, Istanbul, Turkey

ARTICLE INFO

Article history:
Received 3 December 2012
Received in revised form
22 October 2013
Accepted 31 October 2013
Available online 11 November 2013

Keywords:
Bleomycin
Seroma
Mastectomy

ABSTRACT

Seroma formation is one of the most common complications following breast cancer surgery. It may lead to delay of adjuvant therapies and increasement of therapy costs. Bleomycin sulfate is a sclerosing antibiotic with antineoplastic efficacy. It is locally used in the treatment of pleural effusion. The present study aimed to investigate seroma-reducing effect of local bleomycin application after mastectomy. Sixteen female Wistar Albino rats were used in this study. The rats were divided into two equal groups. Under general anesthesia all rats underwent unilateral mastectomy as definition by Harada. Serum physiologic was applied to animals in Group 1 (control group) and bleomycin to Group 2. Mastectomized localization was explored on the 10th day postoperatively. Seroma and tissue samples were obtained from axilla and thoracic wall for histopathological examination. The amount of seroma was significantly lower in the bleomycin group as compared to the control group ($P=0.002$). Fibrosis, PNL infiltration and the number of fibroblasts were significantly higher in the bleomycin group. No difference was identified between the groups in terms of angiogenesis, edema, congestion, and monocyte, lymphocyte and macrophage infiltration. Local bleomycin sulfate application might be a therapeutic option in patients with seroma formation, as well as in the patients with malignant pleural effusion. Nonetheless, further studies that compare the efficacy and adverse effects (benefit-to-harm ratio) of bleomycin sulfate are needed.

© 2013 Elsevier B.V. All rights reserved.

1. Introduction

Seroma formation is one of the most common complications after breast cancer surgery (15–81%) (Woodworth et al., 2000). Seroma occurs following mastectomy as a fluid collection causing fluctuation and tension in the surgical area. Seroma formation might be tedious for the patient because of prolonged therapy period and frequent recurrent aspirations. Moreover, it is an important complication leading to delay in adjuvant therapies and increase in therapy cost.

Although its pathophysiology remains unclear, it is well known that the dead space, which occurs between the tissues after the surgical procedure, contributes to seroma formation. Therefore, various surgical procedures and sclerosing agents are being tried to remove this postoperative dead space. Bleomycin sulfate is a sclerosing antibiotic with antineoplastic efficacy. One of the adverse effects of bleomycin is lung fibrosis, which is a potentially fatal complication that can be developed during systemic use (Sleijfer, 2001). Local sclerosing adhesive effect of bleomycin results from extreme inflammatory stimulation and fibrosis, which occurs locally in the application area. For this purpose, intrapleurally application in the treatment of pleural effusion was reported with 31% and 85% success rate (Paladine et al., 1976; Ruckdeschel et al., 1991; Kessinger and Wigton, 1987; Bitran et al., 1981).

Some sclerosing agents have been used to treat seroma formation after breast cancer surgery and it was reported that they reduced seroma formation to some extent (Burak et al., 1997; Oertli et al., 1994; Tekin et al., 2001; Rice et al., 2000). However, as far as we know, there is no study on this issue performed with bleomycin sulfate. Thus, the present study aimed to investigate seroma-reducing effect of local bleomycin application.

2. Material and method

Sixteen female Wistar Albino rats (mean weight was 220 g) were used in this study. Approval of Yeditepe University Medical Faculty Ethical Committee for Laboratory Animal Research was obtained (02.05.2011 decree no.: 183). Rats were obtained from

* Correspondence to: Kartal Research and Education Hospital, Cevizli, Istanbul, Turkey. Tel.: +90 2123430997; fax: +90 2123431000.
E-mail address: leventkaptanoglu@yahoo.com (L. Kaptanoglu).

0014-2999/$ - see front matter © 2013 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.ejphar.2013.10.067

Yeditepe University Medical Faculty Laboratory Animals Research Center (YULARC). Rats were fed with standard laboratory feed (rodent chow) and water (ad libitum), and were monitored under 12-h dark/light cycles in an isolated room provided with heating control (22 ± 2 °C). Surgical interventions were performed at YULARC laboratory under non-sterile but clean conditions. In order to prevent drug interaction, neither prophylactic antibiotic nor analgesic and anti-inflammatory drug were given during the preoperative period. Rats were weighed prior to the surgical procedure. Exclusion criteria were specified to flap necrosis, infection and death. Bleomycin sulfate (Bleocin-S® Nippon Co. Ltd.) solution was prepared to 10 IU/ml (1000% IU) dissolving in normal saline. Under general anesthesia by injecting 50 mg/kg ketamine (Ketalar®, Parke Davis and Co. Inc.) and 5 mg/kg xylazine (Rompun® Bayer) via intramuscular route, anterior thoracic wall and axillary region were shaved; cleaned by 10% povidone–iodine; and waited for a fine film layer to occur. In accordance with the definition of Harada et al., an incision was made beginning from the sternal notch extending to the xyphoid (11). Skin and the subdermal tissue were detached from thoracic wall and flaps were prepared. The right major pectoral muscle was excised from the thoracic wall. Axillary artery and vein were exposed in the axillary region and preserved. Axillary adipose tissue was excised and unilateral mastectomy and axillary dissection was performed. Neither cautery nor chemical agents were used for hemostasis. Bleeding was stopped by compressing. Cautery use and suturing were avoided. Surgical area was dried with sterile hydrophilic gauze. The rats were divided into two equal groups.

1st Group (control group): The skin was closed by continue suturing; before the last two suture, 0.1 ml normal saline was injected into the surgical space. After the skin was completely closed, gentle massage was applied for a short time for the fluid to disperse within the whole surgical area.

2nd Group (bleomycin group): The skin was closed by continue suturing; before the last two sutures, 0.1 ml bleomycin solution was injected into the surgical space. After the skin was completely closed, gentle massage was applied for a short time for the fluid to disperse within the whole surgical area.

The rats were postoperatively monitored for 10 days in terms of anterior extremity movements, gait, vitality, wound infection,

Fig. 1. Dissection of pectoral muscle and exposing axillary structures.

Fig. 2. Removing pectoral muscle (pectoral muscle is demonstrative).

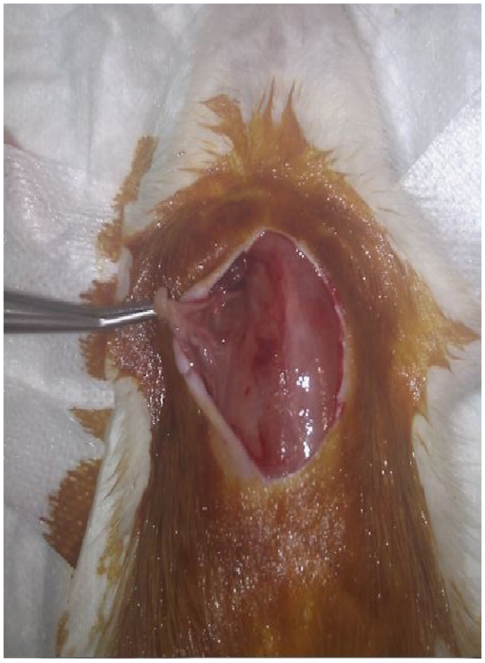

Fig. 3. Dissection of the lymph nodes.

Download English Version:

https://daneshyari.com/en/article/2532024

Download Persian Version:

https://daneshyari.com/article/2532024

Daneshyari.com