The effect of high local concentrations of antibiotics on ash in ovariectomized rats

난소적출 백서에서 치아 회분말 및 연석고 매식시 고농도의 항생제 국소 적용후 효과

Min-Seok Oh, Su-Gwan Kim
Dept. of Oral and Maxillofacial Surgery, Chosun University
오민석, 김수관
조선대학교 치과대학 구강악안면외과학교실

This study was performed to evaluate the clinical effect of high local concentrations of antibiotics on ash in ovariectomized rats, to compare the regeneration of bone defect on osteoporosis patient.

Above 200mg weight, forty-eight Sprague-Dawley rats were randomly selected for this study. An 8-mm-diameter hole was drilled in the skull, removing the entire layer of the skull, by using a 1/4 round bur. Group 1, Non-ovariectomy and non-graft group; Group 2, Non-ovariectomy and tooth ash-plaster graft group which was soaked in saline; Group 3, Non-ovariectomy and ash-plaster graft group which was soaked in gentamicin (Gentamicin®, Daesung Microbiological Labs Co., 15 mg/rat); Group 4, and ash-plaster graft group which was soaked in gentamicin (Gentamicin®, Daesung Microbiological Labs Co., 15 mg/rat).

Each group was further divided into two subgroups: 4 weeks and 8 weeks after implantation. Histologic sections were obtained for histomorphometric analysis of the defects at 4 and 8 weeks after surgery. After a rat was sacrificed using excess ether inhalation, a bone sample was obtained from around the implant site, fixed in 10% neutral formalin for 72 h, and decalcified in nitric acid for 4 h.Statistical analysis was used Wilcoxon signed-ranks test was by using SPSS (SPSS for Window version 7.5, Korea). Values of $p < 0.05$ were considered statistically significant. When each week was compared in each group, new bone formation showed a significant difference ($p=0.000$) in 4-week group. A significant difference

was seen between group1 and 2 (p=0.004), groups 1 and 3 (p=0.004), groups 1 and 4 (p=0.004), groups 2 and 3 (p=0.004), groups 2 and 4 (p=0.004), and groups 3 and 4 (p=0.010). Also in the case of 8-week group, a significant difference (p=0.000) was seen in overall new bone formation. A significant difference was seen in new bone formation between groups 1 and 2 (p=0.004), groups 1 and 3 (p=0.006), groups 1 and 4 (p=0.004), groups 2 and 3 (p=0.006), and groups 2 and 4 (p=0.004). To restore a bony defect severe than the critical defect, a graft is needed to induce new bone formation. Compared with controls, a significant increase in new bone formation was seen with the usage of ash and saline, ash and gentamycin and ash and gentamycin after ovarian resection.

The best result was seen with ash and saline, whereas the effect was slightly less with ash and gentamycin compared with ash and saline. On the other hand, the effect of ash and gentamycin was evaluated according to ovarian resection. The result showed that ovarian resection significantly inhibited new bone formation in 4-week group but not in 8-week group.

Reference

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