

〈原 著〉

アクネローションに加えられたピオニンの
Propionibacterium acnes に対する殺菌効果
ならびにメチルパラベン及び硫黄併用時の検討

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Bactericidal Effect of Pionin Incorporated into Acne-Lotion on *Propionibacterium acnes* and Use in Combination with Methylparaben and Sulfur

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Abstract

The bactericidal effect of pionin on *P.acnes* that was introduced in acne-lotion containing methylparaben as a preservative and water-soluble sulfur as a keratolytic agent was studied in the time course.

The lotion containing only pionin showed a strong bactericidal effect on *P.acnes*: the number of living bacteria was reduced to nil from the initial number of 2.5×10^6 CFU/ml in one hour by adding 5 $\mu\text{g/ml}$ pionin to the lotion. When water-soluble sulfur was used in combination, the bactericidal effect of pionin was, however, affected and greatly reduced.

Water-soluble sulfur is keratolytic and it enhances the penetration of pionin to the deep part of the root of hair and methylparaben suppresses the growth of Gram-negative bacteria. When those agents were used in combination with pionin, the amount of each agent to be used should be carefully determined. For example, to prepare a lotion containing 2% water-soluble sulfur and having the same bactericidal effect as that containing 5 $\mu\text{g/ml}$ of pionin, it was found necessary to use 20 $\mu\text{g/ml}$ pionin and 2000 $\mu\text{g/ml}$ methylparaben.

Furthermore, the changes of the surface layer and inner structure of *P.acnes* inoculated into pionin-incorporated lotion were studied by scanning and transmission electron microscopy. It was found that pionin induced a defect to cell wall and hindered the cell wall formation appeared in a short time, resulted into the bactericidal effect.

Consequently, it was proved that pionin is an useful bactericidal agent against *P.acnes*.

Key words pionin, methylparaben, sulfur, *Propionibacterium acnes*, bactericidal effect