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Antibacterial activity of propolis against MRSA and synergism with topical mupirocin.

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OBJECTIVES: The aim of the present study was to investigate the activity of the propolis and its combinations with mupirocin against methicillin-resistant *Staphylococcus aureus* (MRSA) in nasal carriage. **METHODS:** This study was carried out between June and August 2005. To infect nares of the rabbits, MRSA (ATCC 33591) strain was used. Minimum inhibitory concentration was determined according to National Committee for Clinical Laboratory Standards. Each inoculum was prepared in the same medium at a density adjusted to a 0.5 McFarland turbidity standard (10(5) colony-forming units [cfu]/mL) and diluted 1:100 for the broth microdilution procedure. Ten microliters (10 microL) (10(5) cfu/mL) of the bacterial suspension containing approximately 1000 cfu of MRSA was administered with sterile microsyringe through both nostrils of each rabbit. Ninety-six (96) hours after inoculation, the presence of infection was confirmed by using bacterial cultures. Twenty-six young New Zealand rabbits were randomly divided into 4 groups. Each treatment group (1, 2, and 3) included 7 rabbits and control group (group 4) included 5 rabbits. Group 1 was treated with topical mupirocin + ethanolic extract of propolis drops, group 2 received topical mupirocin, group 3 was administered ethanolic extract of propolis drops, and the control group (group 4) was only treated with phosphate-buffered solution drops for 7 days. At the end of study, nasal cultures and smears were obtained for bacterial count and cytologic examination. **RESULTS:** The colony numbers of bacteria in group 1 were determined to be significantly lower than in group 2 ($p = 0.0001$), group 3 ($p = 0.0001$), and group 4 ($p = 0.0001$). The mean bacterial cell counts of groups 1-4 were 360.2 +/- 52.4 cfu/mL, 4120.6 +/- 860.4 cfu/mL, 5980.8 +/- 1240.6 cfu/mL, and 11500.0 +/- 2568.4 cfu/mL, respectively. Mupirocin + propolis administration (group 1) resulted in a significant reduction in the polymorphonuclear leukocyte (PMNL) count in the mucous membranes of rabbits compared with the other treatment groups ($p < 0.05$). **CONCLUSIONS:** Propolis addition to mupirocin regimen was found to result in more profound reduction in bacterial cell count and inflammatory response compared with the rest of the treatment modalities.

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