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Abstract (publication only)

**Antibacterial activity of bupivacaine alone and combined with S-ketamine against bacteria causing catheter-associated infections**

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**Background and aim:** Several of the local anaesthetics used for spinal anaesthesia were shown to possess antibacterial activity. The study was undertaken to evaluate the antibacterial effect of bupivacain alone and combined with S-ketamine on seven different microorganisms. **Material and methods:** The microorganisms tested were: *Staphylococcus aureus* ATCC 25923, *Staphylococcus epidermidis*, methicillin-resistant *S. aureus*, *Enterococcus faecalis* ATCC 29212, *Escherichia coli* 29212, *Pseudomonas aeruginosa* ATCC 27853 and *Acinetobacter baumannii* 19091. Bactericidal effect of bupivacaine was tested in concentrations of 0.5, 0.25 and 0.12%. The bactericidal activity was determined by standard microbiological methods. The number of colony-forming unit (CFU) was counted and the number of viable bacteria was plotted against time to obtain a time-kill curve. Anaesthetic was considered to possess antimicrobial activity when a significant difference in CFU/ml (1log10) was observed between the initial and postexposure values. **Results:** Bupivacaine with and without S-ketamine significantly reduced (2 to 4 log10) the CFU of *S. aureus*, *S. epidermidis* and *E. faecalis* in all concentrations. The reduction of viable counts was more pronounced with higher concentration of anaesthetic and after addition of S-ketamine. With MRSA significant reduction of viable counts was observed only with 0.5% of bupivacaine. Against *A. baumannii* bupivacain produced a small (1 log10) but significant reduction in viable count number in concentration of 0.5 and 0.25% but when combined with S-ketamine the reduction was more pronounced (1 log10 to 4 log10) in all concentrations. Bupivacaine exerted significant bactericidal activity against *P. aeruginosa* only in the highest concentration. Addition of S-ketamine did not improve antibacterial activity. *E. coli* exhibited strong and significant decrease in viable counts after exposure to bupivacaine. **Conclusions:** In this study, the antimicrobial effect of bupivacaine in various concentrations alone and combined with S-ketamine was studied. Significant antibacterial effect of bupivacain alone and combined with S-ketamine was noticed in all tested bacteria except of *P. aeruginosa*. Addition of S-ketamine enhanced the antibacterial activity of bupivacaine. Antibacterial activity of bupivacaine was concentration dependent and time-dependent. Bactericidal activity of local anaesthetic could prevent infection in patients with indwelling catheters.