

## **Evaluation and comparison of Chlorhexidine gluconate bathing solution and antiseptic wipes antimicrobial effects against bacteria causing nosocomial infections**

### **ABSTRACT**

Nosocomial infections among critical patients in intensive care units are associated with significant morbidity and mortality globally, including in Malaysia. Both Chlorhexidine gluconate (CHG) bathing solution and antiseptic wipes were used in preoperative preparation. A controversy was reported on the inhibitory effects of antiseptic wipes and CHG bathing solution on the bacteria causing nosocomial infections. This study was conducted to evaluate the antimicrobial effects of the antiseptic wipes and CHG bathing solution on nosocomial bacteria (methicillin-resistant *S. aureus* (MRSA), *Acinetobacter baumannii*, *Escherichia coli*, *Klebsiella* spp. and *Pseudomonas aeruginosa*). The antibacterial effectiveness of antiseptic wipes impregnated with 2% CHG and bathing solution 4% CHG were assessed using agar well diffusion method. Microtiter plate assay was used to estimate the minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC). The CHG from antiseptic wipes was aseptically extracted by squeezing method. The CHG bathing solution revealed excellent inhibitory effects against all study bacteria with inhibition zones [15 mm (*A. Baumannii*), 17 mm (*Klebsiella* spp.), 20 mm (*Pseudomonas aeruginosa*), 23 mm (*Escherichia coli*) and 25 mm (MRSA)]. In contrast, antiseptic wipes were effective against *E. coli* only with 15 mm inhibition zone. The MIC of CHG bathing solution was 0.03% for all study bacteria except for *P. aeruginosa*, which was 0.06%; however, the MIC of the antiseptic wipes against MRSA and *E. coli* were 0.13% and 0.5%, respectively. The MBC of CHG bathing solution against MRSA, *A. baumannii* and *E. coli* were 4%, 0.25% and 0.5% respectively. The MBC of antiseptic wipes couldn't be determined since all study bacteria showed uncountable colonies even with the highest concentrations. In conclusion, CHG bathing solution showed a stronger antibacterial effect than antiseptic wipes against nosocomial bacteria. Using CHG bathing solution will significantly reduce the risks of acquiring multidrug resistant organisms and developing nosocomial infections.