

Digital Antimicrobial Thermometer for Axillary Usage: A New Device for Measuring the Temperature of the Body for the Reduction of Cross-Infections

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Abstract : Aim: The aim of this prospective comparative study is to evaluate the reduction of microbial flora on the surface of an axillary digital thermometer, made of antimicrobial copper, in relation with a common digital thermometer. Material - Methods: A brand new digital electronic thermometer implemented with antimicrobial copper (Cu 70% - Nic 30%, low lead) on the two edges of the device (top and bottom: World Patent Number WO2013064847 and Register Number by the Hellenic Copper Development Institute No 11/2012) was manufactured and a comparative study with common digital electronic thermometer was conducted on 18 ICU (Intensive Care Unit) patients of three different hospitals. The thermometry was performed in accordance with the projected International Nursing Protocols for body temperature measurement. A total of 216 microbiological samples were taken from the axillary area of the patients, using both of the investigated body temperature devices. Simultaneously the "Halo" phenomenon (phenomenon "Stefanis") was studied at the non-antimicrobial copper-implemented parts of the antimicrobial digital electronic thermometer. Results: In all samples collected from the surface of the antimicrobial electronic digital thermometer, the reduction of microbial flora (*Klebsiella* spp, *Staphylococcus aureus*, *Staphylococcus epidermitis*, *Candida* spp, *Pseudomonas* spp) was progressively reduced to 99% in two hours after the thermometry. The above flora was found in the axillary cavity remained the same in common thermometer. The statistical analysis (SPSS 21) showed a statistically significant reduction of the microbial load ($N = 216, < 0.05$). Conclusions: The hospital-acquired infections are linked to the transfer of pathogens due to the multi-usage of medical devices from both health professionals and patients, such as axillary thermometers. The use of antimicrobial digital electronic thermometer minimizes microbes' transportation between patients and health professionals while having all the conditions of reliability, proper functioning, security, ease of use and reduced cost.

Keywords : antimicrobial copper, cross infections, digital thermometers, ICU

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