Promising treatment for pressure ulcers

D. HERMINAWATY, I.R. DEFI, T. PRABOWO, I. PARWATI. ***Promising treatment for pressure ulcers using high voltage pulsed current stimulation.*** *Gerontechnology 2014;13(2):202;* doi: 10.4017/gt.2014.13.02.266.00 **Purpose** Immobilization will often lead to a pressure ulcer. The breadth and depth of the impacts of a pressure ulcer on quality of life are significant. Quality of life is impacted physically, psychologically, emotionally, spiritually, socially, and financially[1]. A study in Indonesia about pressure ulcers reported that out of 253 patients, 72 (28.4%) developed pressure ulcers[2]. High Voltage Pulsed Current (HVPC), one type of electrical current stimulation, has been used to promote wound healing[3]. One mechanism of HVPC is thought to be antimicrobial[4]. This study was designed to observe the effect of HVPC on extended spectrum beta-lactamase-producing *Klebsiella pneumoniae* (ESBLKp), which is commonly found in cultures of pressure ulcers in Hasan Sadikin Hospital, Bandung, Indonesia **Method** ESBLKp was poured into agarose-based solid medium, and HVPC was applied immediately thereafter. HVPC was delivered with special cables with alligator clips (*Figure 1*) and tested with a multitester and oscilloscope for uniformity. The HVPC parameters were 250V, 100Hz, 50-µs pulse interval, and the current controlled. The duration of application was 30 minutes, one hour, or two hours. The process was repeated on four cultures for each duration. Each plate was incubated for 2x24 hours, and an antimicrobial effect was indicated by observing an inhibitory zone at both poles. The diameter of the inhibitory zone was measured at the same time each day. **Results & Discussion** A bacterial inhibitory effect was found at both poles at every duration of application (*Figure 2*). The largest inhibitory zone (27 mm) was observed on the second day around the cathode in the plate that received two hours of application. A different pattern of inhibition was found at the anode, smaller but with a clearer zone. HVPC stimulation is a promising treatment for pressure ulcers with *Klebsiella pneumoniae*, because it may promote faster healing. Further study is needed to define the appropriate parameters and schedule for the application of HVPC stimulation directly on people's wounds.

References

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Keywords: health & self-esteem, HVPC, K*lebsiella pneumoniae,* pressure ulcer

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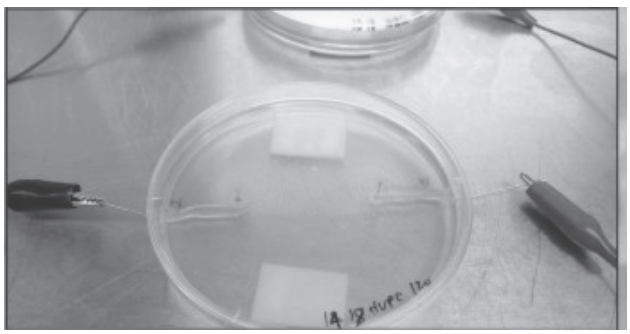

Figure 1. Agarose-based solid medium and special cables with alligator clips to deliver HPVC

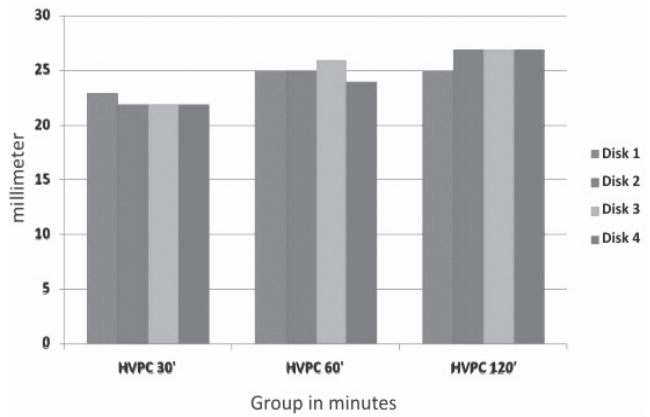

Figure 2. Inhibitory zone around the cathode after 48 hours