Simple procedures to reduce *Staphylococcus epidermidis* adhesion to indwelling medical devices

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**Objectives:** The aim of this work was to develop expedite procedures to reduce *Staphylococcus epidermidis* adhesion to materials normally used in indwelling medical devices such as catheters and prosthesis using only a pre-contact of the material surface with two conditioning substances: heparin and gentian violet. Heparin is a proteoglycan with strong anticoagulant activity, normally used to minimise thrombus formation, and gentian violet is a triphenylmethane dye that is normally used as a biological stain and as antiseptic agent.

**Methods:** Three clinical *S. epidermidis* strains were studied: 9142-M10, 9142 and IE186. Acrylic and silicone were used as substratum. Coupons (2 cm × 2 cm) were immersed in heparin or in 1% gentian violet solution, left to soak for 2 hours and left to dry overnight at 21 °C. For the adhesion assays, the coupons were placed in 6 well tissue-culture plates with 4 mL of a cell suspension (1×10^9 cells/ml), for 2 hours, at 37°C and 120 rpm. Each coupon was then stained with 4,6-diamino-2-phenylindole (DAPI) solution and adhered cells were visualised under an epifluorescence microscope and enumerated with appropriated software. The coupons with adhered cells were also observed by scanning electronic microscopy (SEM).

**Results:** The results of the adhesion assays point to a significant decrease in bacterial adhesion to silicone and acrylic after pre-contact with both conditioning substances. The only exception was observed for strain IE186, which adhered at a similar extent to acrylic pre-contacted with gentian violet and non-pre-contacted acrylic.

**Conclusion:** The results obtained in this work have a potential clinical significance showing that both heparin and gentian violet are effective in reducing bacterial adhesion. Pre-treatment of biomedical materials with these substances may constitute a successful and expedite procedure to reduce the incidence of nosocomial infections, especially during the insertion of indwelling medical devices.

**Session Info:** Infection control and nosocomial infections

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