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Changes of the skin barrier and bacterial colonization after hair removal by clipper and by razor

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ABSTRACT

Background: Inappropriate hair removal increases the risk of surgical site infections which are associated with a higher morbidity and mortality of surgical patients. Here, the effects of a clipping device and a disposable razor on the skin barrier, microbial burden and surface structure were compared. **Methods:** Changes in bacterial colonization, transepidermal water loss, antioxidant status and the skin surface structure were investigated on the calves of 12 healthy volunteers. Measurement timepoints were at baseline (t_{base}) and 24 hours after hair removal (t₂₄). **Results:** Both, the disposable razor and the clipper showed a decrease in log colony-forming units count from t_{base} (mean(t_{base}) ± standard deviation = 2.6 ± 1.27, median ± standard error = 2.6 ± 0.37) to t₂₄ at p_{razor} = 0.05 and p_{clipper} = 0.06 respectively. At t₂₄ clipping resulted in a higher reduction of log colony-forming units (mean(t₂₄) = 1.76 ± 0.8, median = 1.69 ± 0.23) compared to the use of the disposable razor (mean(t₂₄) = 1.84 ± 0.85, median = 1.91 ± 0.24). Furthermore, the razor-treated group showed an increase in colony-forming units from t₀ to t₂₄, whereas clipping led to a continuous decrease in colony-forming units from t₀ to t₂₄. An enhanced appearance of microlesions and a significant increase of transepidermal water loss after shaving using the disposable razor (p = 0.005) were found indicating skin barrier disruptions. Clipping showed no significant effect on transepidermal water loss. **Conclusion:** Hair removal using the clipping device results in less disruption of the skin barrier compared to the razor, avoiding the development of microlesions. This could be favorable for the prevention of surgical site infections and postoperative wound management. © 2016 Journal of Biomedical Photonics & Engineering. **Keywords:** preoperative hair removal, skin barrier disruption, post-operative, postsurgical infection, clipping.