# Zinc oxide reduces body odor caused by bacteria and aids wound healing

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New research presented at this week's European Congress of Clinical Microbiology & Infectious Diseases (ECCMID) in Amsterdam, Netherlands (13-16 April) shows that a formulation containing zinc oxide is effective at reducing armpit odour through killing the responsible bacteria, and assists in wound healing. The study was carried out by Professor Magnus S. Ågren, Copenhagen Wound Healing Center, Bispebjerg Hospital, Copenhagen, Denmark (where the study took place) and Khaled Saoud Ali Ghathian, Department of Clinical Microbiology, Hvidovre Hospital, Hvidovre, Denmark and colleagues.

Bothersome odour from the axilla (under the armpit) is in most cases caused by Corynebacterium spp. and Staphylococcus spp. The antimicrobial effects of zinc oxide (ZnO) have been extensively documented. In experimental studies, ZnO prevented bacterial generation of short-chain fatty acids with a bad smell. Furthermore, topical ZnO reduced the occurrence of corynebacteria and bad odour from open surgical wounds, which gave the idea to the researchers to test the compound on body odour directly.

The axilla is warm, moist and nutrient rich, all of which are conditions that increase pH. Because the solubility of ZnO is pH-dependent, the efficacy may vary due to the skin surface pH. Moreover, there is no consensus on the effect of gender on axillary pH level.

The primary aim of this double-blind, placebo-controlled trial (ZINC-ON) was to study if repeated application of ZnO formulated in an oil-in-

water emulsion reduced underarm odour in healthy volunteers. The association with the overall bacterial growth and specifically of Corynebacterium spp. and S. hominis was also studied. Skin surface pH was monitored in parallel. Secondly, the anti-inflammatory and wound-healing effects of topical ZnO were studied by assessing the extent of skin erythema and keratin evolution in two standardised wound models: one inflicted by a contact-activated lancet producing small bleeding wounds and the other was induced by ablative CO2 laser producing dry erosions in the skin.

The trial included 30 healthy volunteers (15 female/15 male) of mean age of 25.6 years. Participants' left and right axilla were randomised to ZnO application or placebo and treated for 13 consecutive days with 5 visits to the hospital. The participants were enrolled, swabbed and started treatment on day minus 8; on day 0 bacterial swabs were obtained again and wounds were inflicted, and then the participants were seen on days 3, 4 and 5. At the last visit day 5, the participants were asked (1) whether they had observed a difference in the odour from the left and right axillae and, if so, (2) to state which axilla they judged superior with respect to odour.

Treatment with ZnO reduced self-perceived bad odour compared with placebo. The overall bacterial growth and specifically the odour-generating Corynebacterium spp. and S. hominis were reduced with ZnO treatment despite increasing skin surface pH (all results were statistically significant). Topical ZnO reduced peri-wound erythema (redness) around the lancet-induced wounds and promoted the formation of keratin.

The authors conclude: "Daily application of ZnO reduced malodour from the axilla and causative bacteria, increased skin surface pH and attenuated wound inflammation."

Professor Ågren says: "The most frequent response we had from participants was: 'where can I buy this fantastic product?'. Even though it contained no fragrance like conventional deodorants, the participants could identify that it had neutralised any bad odour under the arm where it was applied. The product has since been progressed to commercialisation by Colgate-Palmolive, who produced the product and sponsored this trial."

Provided by European Society of Clinical Microbiology and Infectious Diseases

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