

Axillary bacterial transplantation and bacteriotherapy as a promising technique to treat bromhidrosis

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In this research, we report a successful axillary bacterial transplantation / bacteriotherapy of the axillary microbiota to treat bromhidrosis, in which offensive body odour emanated from the axillae. Subjects with significant body odour were selected for treatment. Odour assessment was done by a trained odour panel. Axillary samples were analysed by means of denaturing gradient gel electrophoresis (DGGE). A first case study was performed on a monozygotic male twin who did not co-habit, in which one twin had a significant body odour and the other one did not ($p < 0.05$). Molecular analysis showed that one twin had mostly corynebacteria, while the other twin mostly staphylococci as dominant species in the axillae. *Corynebacterium* spp. are linked to the generation of body odour as they possess the enzymatic capacity to convert long-chain fatty acids into typical odorous short-chain fatty acids, while *Staphylococcus* spp. do not possess these enzymes. An axillary bacterial transplantation was executed from the non-odorous twin to the odorous twin. Only one axilla was treated, whilst the other was used as a reference. Immediately after treatment, hedonic values improved for the treated axilla. Three days after the treatment, the non-treated axilla improved in hedonic values as well. The remarkable results were confirmed by DGGE. Improvements in hedonic values were associated with an increase in abundance of staphylococci and a decrease in abundance of corynebacteria. Also after treatment, the axillary community permanently changed towards a higher abundance of staphylococci. Secondly, bacteriotherapy was applied on two other subjects by means of a daily application of a pure *Staphylococcus* strain (during three weeks). The treatment was not successful every day, probably due to inadequate follow-up of procedure rules by the subjects. However, where there was a significant difference in hedonic value between treated and not-treated axilla, an increase of staphylococci and a decrease of corynebacteria was noticed. When treatment stopped, the original axillary microbial community was again noticed. Based on these initial results, with one permanently improved axillary community and two temporarily improvements, axillary bacteriotherapy seems a promising technique to treat bromhidrosis.