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Subject: Kopfhautmassage hilft (vielleicht doch)  
Posted by [kkoo](#) on Sat, 27 Feb 2016 19:34:35 GMT  
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<http://www.ncbi.nlm.nih.gov/pubmed/26904154>

Zitat:

"Standardized Scalp Massage Results in Increased Hair Thickness by Inducing Stretching Forces to Dermal Papilla Cells in the Subcutaneous Tissue.

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Author information

Abstract

OBJECTIVE:

In this study, we evaluated the effect of scalp massage on hair in Japanese males and the effect of stretching forces on human dermal papilla cells in vitro.

METHODS:

Nine healthy men received 4 minutes of standardized scalp massage per day for 24 weeks using a scalp massage device. Total hair number, hair thickness, and hair growth rate were evaluated. The mechanical effect of scalp massage on subcutaneous tissue was analyzed using a finite element method. To evaluate the effect of mechanical forces, human dermal papilla cells were cultured using a 72-hour stretching cycle. Gene expression change was analyzed using DNA microarray analyses. In addition, expression of hair cycle-related genes including IL6, NOGGIN, BMP4, and SMAD4 were evaluated using real-time reverse transcription-polymerase chain reaction.

RESULTS:

Standardized scalp massage resulted in increased hair thickness 24 weeks after initiation of massage ( $0.085 \pm 0.003$  mm vs  $0.092 \pm 0.001$  mm). Finite element method showed that scalp massage caused z-direction displacement and von Mises stress on subcutaneous tissue. In vitro, DNA microarray showed gene expression change significantly compared with nonstretching human dermal papilla cells. A total of 2655 genes were upregulated and 2823 genes were downregulated. Real-time reverse transcription-polymerase chain reaction demonstrated increased expression of hair cycle-related genes such as NOGGIN, BMP4, SMAD4, and IL6ST and decrease in hair loss-related genes such as IL6.

CONCLUSIONS:

Stretching forces result in changes in gene expression in human dermal papilla cells. Standardized scalp massage is a way to transmit mechanical stress to human dermal papilla cells in subcutaneous tissue. Hair thickness was shown to increase with standardized scalp massage."

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