A future role of objectifying skin cleansers

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Overview

- **Background**

- **Objectifying efficacy of skin cleansing**
  - **Challenges**
    - *Development of an in-vivo-model*
      - Automated Cleansing Device for skin cleansing (ACiD)
      - Model dirt and generic reference cleansers
      - Measurement of detergency
      - Measurement of skin compatibility
      - Validation of the model: multicentre study

- **Future role of objectifying skin cleansers**
Background

- Occupational skin diseases
- Regulations
- Manufacturers’ practice
  (Market survey; Terhaer et al 2010, JDDG, 8:806–811)
- Project “In-vivo Evaluation of Skin Cleansing Products”
Challenges of objectifying skin cleansing products

- standardisation of the cleansing process
- identification and simulation of occupational exposure & development of model dirt
- development of standard generic reference cleansers
- development of an in-vivo model for measuring detergency
- development of an in-vivo model for measuring skin compatibility
Development of an in-vivo-model

*Automated Cleansing Device (ACiD)*

Steps of development

Development of an in-vivo-model
*Automated Cleansing Device (ACiD)*

**Working principle**

- Pressure: 5-150g
- Rotations/minute: 10-100
- Swipes/minute: 12
Development of an in-vivo-model
Automated Cleansing Device (ACiD)

identification of an appropriate washing surface
Development of an in-vivo-model Automated Cleansing Device (ACiD)

identification of an appropriate washing surface

results

felt covered with nitrile turns out to be most suitable

• homogeneous washing results
• no false-positive cleansing results
• no influence on skin redness and TEWL
Development of model-dirts*  
1. hydrophilic model dirt (type “mascara”)  
2. lipophilic model dirt (type "W/O cream")  
3. paste-like model dirt I (type “waste oil”)  
4. past-like model dirt II (type “ointment”)  
5. film-forming model dirt I (type “disperse paint”) and  
6. film-forming model dirt II (type “acrylic paint”)  

Development of standard generic reference cleansers*  
1. “atopic cleanser”  
2. “normal cleanser”  
3. “cleanser with solvents”  
4. “cleanser with friction particles”  
5. “cleanser with solvents and friction particles”  

*galenic formulas by G. Kutz; validation by University of Jena (Elsner et al. 2013, Contact Dermatitis, 69: 245-50)
Development of an in-vivo-model
Skin-Cleansing Model

detergency

Elsner et al. 2013, Contact Dermatitis, 70: 35–43
# Development of an in-vivo-model

**Skin-Cleansing Model**

### Skin Compatibility

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
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<td><strong>acclimatization</strong></td>
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1. drawing test fields
2. bioengineering measurements: TEWL, RHF, a*value
3. medical examination: visual score (redness, scaling, dryness, etc.)

1. **washing** (using ACiD without soiling the skin)
   - 2 hours
2. washing
   - 2 hours
3. washing

*final examinations/measurements*

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Elsner et al. 2013, Contact Dermatitis, 70:151-157
Development of an in-vivo-model

Validation of the model

multicentre study: 17.01.2011-18.02.2011
Centres: Jena, Heidelberg, Osnabrück (n=48; n/centre=16)

TEWL for quantification of skin compatibility
L*-value for quantification of detergency

Visualizing their relations (product labels)
Development of an in-vivo-model

Visualizing relations (TEWL – L*value)

Results of the multicentre study: Proposal for product labeling

“mascara”/”atopic”

“disperse paint”/”friction particles”

“acrylic paint”/”special”

“ointment”/”solvents”

“waste oil”/”normal”

“w/o cream”/”normal”

0 irritation [ΔTEWL, %]

100 detergency [%]

50
Future role of objectifying skin cleansers

• implementation of the model
• development of a standardized labeling system based on the model
  ➢ market transparency for occupational skin cleansers
  ➢ facilitating the rational choice of the most suitable product, putting cleansing effectiveness in relation to the potential for skin irritation
Publications

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- **our project partners**
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  - Dept. of Social Medicine, Occupational and Environmental Dermatology, University Heidelberg
  - Dept. of Occupational Dermatology, Environmental Medicine and Health Theory, University of Osnabrück

- **Many thanks for your attention!**