Dermatology clinic perspective

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No conflict of interest to declare
Take Home Messages

- Severe cases of consumer and occupational allergic nickel dermatitis are still observed.
- The EU Nickel Regulation has lead to a significant decrease of nickel allergy and dermatitis.
- However, the prevalence of nickel allergy and dermatitis remains high and have stabilized.
- The scare of nickel allergy will be very expensive to our societies as people age and undergo implant surgery.
- Nickel allergy is a global health issue
History Repeats Itself...

Guarnieri, CD 2010.
Let’s go back in Time
Increase of Nickel Allergy in General Populations

Thyssen, Contact Dermatitis 2007

Menné and Bachmann, 1979.

Permanent disability from hand dermatitis in females sensitive to nickel, chromium and cobalt.

222 Danes applied for permanent disability pension due to allergic contact eczema.

99 had nickel allergy

In 43 the primary eczema was on the hands, in 38 under costume jewellery, suspenders, etc.

In 53%, hand eczema started in occupations with high nickel exposure.

My conclusion: combination of consumer and work nickel exposure very problematic!

1. Original requirement (before 2003): Nickel was prohibited in post-assemblies used during epithelialization after piercing, unless they were homogeneous and the nickel concentration was less than 0.05%.

New requirement from 2003: Nickel release from all items inserted into pierced parts of the body (not only during epithelialization after piercing) should be less than 0.2 μg/cm²/week.

2. Nickel may not be used in products intended to come into direct and prolonged contact with the skin, such as ear-rings, necklaces, finger rings, spectacles, wristwatches, buttons if nickel release from the parts coming into direct and prolonged contact with the skin is greater than 0.5 μg/cm²/week.

3. Nickel is prohibited in products such as those listed under point 2 if they have a coating and if they do not fulfill the requirement under point 2 for a period of 2 years of normal use.

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Epidemiology after nickel regulation
Nickel Allergy Following Regulation
(Danish Women – 18-69 years; n=2,117)

Nickel Allergy Following Regulation
(Danish Female Dermatitis patients, n=10,335)
Germany – The Follow-up (n=78,795)

Schnuch CD, 2011.

Patch test reactivity to nickel (+, ++, +++)

Thyssen Contact Dermatitis
Nickel Allergy and Hand Eczema Following Regulation (Danish Women – 18-69 years; n=2,117)

Table 2. Nickel allergy stratified by a history of hand eczema among female participants

<table>
<thead>
<tr>
<th>Age group (year)</th>
<th>Test year</th>
<th>Nickel allergy</th>
<th>Crude OR</th>
<th>Nickel allergy</th>
<th>Crude OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1990</td>
<td>Yes</td>
<td>No</td>
<td>Crude OR</td>
<td>Yes</td>
</tr>
<tr>
<td>18–35 History of hand eczema</td>
<td>Yes</td>
<td>9.4 (10)</td>
<td>16.0 (17)</td>
<td>3.63 (1.33-9.96)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>10.4 (11)</td>
<td>64.2 (88)</td>
<td>9.4 (3.64)</td>
<td>No</td>
</tr>
<tr>
<td>36–55 History of hand eczema</td>
<td>Yes</td>
<td>1.6 (2)</td>
<td>32.3 (40)</td>
<td>0.63 (0.12–3.28)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>4.8 (6)</td>
<td>61.3 (76)</td>
<td>8.6 (4.97)</td>
<td>No</td>
</tr>
<tr>
<td>56–69 History of hand eczema</td>
<td>Yes</td>
<td>0 (0)</td>
<td>13.6 (6)</td>
<td>0.97 (0.92–1.03)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2.3 (1)</td>
<td>84.1 (37)</td>
<td>3.8 (21)</td>
<td>No</td>
</tr>
</tbody>
</table>

Reasons for Persistence of Ni Allergy

- The regulation is too weak (yes, 0.1 rule)
- Violation of the regulation (yes, most certainly)
- Lack of control by authorities (yes)
- New items cause Ni allergy (yes, laptops, phones)
- Sensitization before regulation (yes, but only in older individuals)
- Other sources: toys, medical devices, occupational (minor)
Exposures

The Nickel Spot Test (Dimethylglyoxime)

THRESHOLD
0.5 μg Ni / cm²/week
**Excessive Nickel Release from 354 Consumer Items purchased from 36 Stores in CPH**

- **Hair clasps, adults**
- **Hair clasps, children**
- **Finger rings**
- **Necklaces**
- **Rings**
- **Bracelets**
- **Total**
- **Total, adults**
- **Total, children**


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**Nickel Release from Earrings – Global Problem**

- **London** (n=205)
- **Warsaw** (n=206)
- **Copenhagen** (n=170)
- **Nijmegen** (n=47)
- **Stockholm** (n=61)
- **San Francisco** (n=277)
- **Chengdu & Beijing** (n=314)
- **Bangkok, Phuket, Hatyai** (n=243)

Thyssen JEADV
Nickel allergy is more common in patients with atopic dermatitis

n = 2,305
Perhaps due to filaggrin deficiency

Metal exposure is significant in childhood

Xbox—A Source of Nickel Exposure in Children

Abstract: Macintosh laptop computers and iPhone5s were recently added to the list of potential nickel sources. The Xbox gaming controller also joins the list.

Allergic Contact Dermatitis to a Laptop Computer in a Child

Sharon E. Jacob, M.D., and Shehla Admani, M.D.
Childrens toys with metallic parts release nickel

- Denmark (n=149): 27.5% DMG pos.
- USA (n=63): 50.8% DMG pos.
- Total (n=212): 34.4% DMG pos.

Other consequences of nickel allergy
Suspected nickel allergies want nickel free implants and undergo pre-implant patch testing

Time for safe alloys?
Thanks for your attention