A longitudinal study to track changes in long-term smoking behaviour of smokers of 10 mg ISO tar cigarettes in Germany – third time point

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Outline

- Background and Objectives
- Study Design
- Subject Recruitment Criteria
- Results
- Conclusions
Background and Objectives

- **Background**
  - Few longitudinal studies on the effects of spontaneous product switching

- **Objectives**
  - To monitor the Mouth Level Exposure* (MLE), smoking behaviour and Biomarkers of Exposure from subjects over an extended period of time
  - To assess spontaneous product switching
  - To assess compensatory smoking behaviour over an extended period of time

Study Design

- **Longitudinal Study**
  - Observational and ambulatory
  - Approved by Central Bavarian Ethical Committee
  - Registered clinical study (ISRCTN95019245)
  - Ten cities across Germany

- **Fieldwork (every six months)**
  - 3 visits during 12 days
  - Mouth level exposure
    - Filter collection
    - Biomarkers of exposure
      - 24h urine (nicotine + 5, Total NNAL, creatinine)
      - Spot saliva (cotinine & OH-cotinine)
  - Questionnaires

- **Telephone interviews between fieldwork periods**
Subject Recruitment Criteria

- 1000 healthy smokers aged 21 – 64 across 10 cities
- Lucky Strike Red (LSR) smokers for at least 6 months
- Regular smokers of ≥8 cigs per day
- Smokers who were representative of the demographics (age and gender) of LSR
- Females must be non-pregnant
Results

- Subjects and Product Switching Frequencies for Time Points (TP) 1-3

- All data are preliminary and presented on an Intention to treat basis
- No statistical analysis was performed on this interim data, only descriptive statistics will be presented

<table>
<thead>
<tr>
<th></th>
<th>TP1</th>
<th>TP2</th>
<th>TP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects</td>
<td>1011</td>
<td>820</td>
<td>744</td>
</tr>
<tr>
<td>LSR smokers</td>
<td>1011</td>
<td>741</td>
<td>614</td>
</tr>
<tr>
<td>Sideswitchers</td>
<td>-</td>
<td>39</td>
<td>58</td>
</tr>
<tr>
<td>Downswitchers</td>
<td>-</td>
<td>40</td>
<td>72</td>
</tr>
<tr>
<td>Total Products</td>
<td>1</td>
<td>30</td>
<td>44</td>
</tr>
<tr>
<td>Sideswitcher products</td>
<td>-</td>
<td>19</td>
<td>27</td>
</tr>
<tr>
<td>Downswitcher products</td>
<td>-</td>
<td>10</td>
<td>16</td>
</tr>
</tbody>
</table>
### Summary data Lucky Strike Red Smokers
- only those who attended all Time Points 1-3

<table>
<thead>
<tr>
<th>Variable</th>
<th>TP1</th>
<th>TP2</th>
<th>TP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spent Filters in Cutter</td>
<td>15.7 ± 6.6</td>
<td>14.9 ± 6.6</td>
<td>15.4 ± 7.1</td>
</tr>
<tr>
<td>MLE Tar (mg/cig)</td>
<td>17.9 ± 5.6</td>
<td>19.6 ± 6.2</td>
<td>19.1 ± 5.8</td>
</tr>
<tr>
<td>Daily MLE Tar (mg)</td>
<td>284 ± 152</td>
<td>294 ± 158</td>
<td>294 ± 155</td>
</tr>
<tr>
<td>MLE Nicotine (mg/cig)</td>
<td>1.51 ± 0.47</td>
<td>1.60 ± 0.48</td>
<td>1.51 ± 0.44</td>
</tr>
<tr>
<td>Daily MLE Nicotine (mg)</td>
<td>24.1 ± 13.2</td>
<td>24.1 ± 12.9</td>
<td>23.5 ± 12.7</td>
</tr>
<tr>
<td>Daily Nicotine Equivalents (mg)</td>
<td>14.4 ± 9.2</td>
<td>11.9 ± 9.0</td>
<td>12.9 ± 9.2</td>
</tr>
<tr>
<td>Daily Total NNAL (ng)</td>
<td>326 ± 236</td>
<td>301 ± 232</td>
<td>276 ± 227</td>
</tr>
<tr>
<td>Daily Creatinine (mg)</td>
<td>1388 ± 549</td>
<td>1304 ± 643</td>
<td>1327 ± 616</td>
</tr>
<tr>
<td>Salivary Cotinine (ng/mL)</td>
<td>273 ± 169</td>
<td>280 ± 172</td>
<td>289 ± 174</td>
</tr>
</tbody>
</table>
Results
- boxplot graphs

- Each pair of boxplots show matched baseline data (LSR, TP1) against sideswitchers and downswitchers at TP2 and TP3

- show the same subjects in each pair of boxplots
- allows comparisons within switching groups (pre- or post switch) and against non-switching LSR smokers
Results Daily MLE Tar

- LSR
- SS
- DS

Smoker Type
- LSR
- SS
- DS

Daily MLE Tar (mg/day)

<table>
<thead>
<tr>
<th>Smoker Type</th>
<th>Time Point</th>
<th>LSR</th>
<th>SS 1vs2</th>
<th>DS</th>
<th>LSR 1vs3</th>
<th>SS 1vs3</th>
<th>DS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>738</td>
<td>39</td>
<td>40</td>
<td>612</td>
<td>57</td>
<td>72</td>
</tr>
</tbody>
</table>

n = 738, 39, 40, 612, 57, 72
Results Daily MLE Nicotine

n = 738 39 40 612 57 72

Smoker_Type
- LSR
- SS
- DS

Daily MLE Nicotine (mg/day)

Smoker Type
- LSR
- SS
- DS

Time Point
- LSR
- SS
- DS

n = 738 39 40 612 57 72
Results Spent Filters in Cutters

![Box plot showing the distribution of spent filters for different smoker types (LSR, SS, DS) at various time points (1 vs 2, 1 vs 3). The number of samples for each category is provided: 739, 39, 40, 613, 57, 72.]
Results Daily Nicotine Equivalents
- 24 hour ambulatory urine

n = 738 38 39 611 56 72
Conclusions - non switchers

- 614 LSR subjects smoke LSR at TP3, with 590 subjects attending all three time points.
- The LSR Subjects showed consistent data for:
  - Cigarette consumption (spent filters in cutter)
  - Daily MLE to nicotine and tar
  - Salivary cotinine
  - Urinary creatinine
- More variation was observed in daily nicotine equivalents and total NNAL across time points. Possible sources of variation include:
  - Non-compliance in 24 hour ambulatory urine and spent filter collection
  - Variation in biomarker analyses
  - Batch variability in supplied products
  - Metabolic variation within and between subjects
Conclusion - sideswitchers

- 5% of subjects sideswitched at TP2, increasing to 8% at TP3
- Sideswitchers showed consistent data with some exceptions
  - decreases in daily MLE nicotine and cigarette consumption at TP2
  - decrease in nicotine equivalents at TP2, possibly affected by the sources of variation discussed, i.e. 24 hour ambulatory urine compliance and variation in biomarker analyses

- Sideswitchers compared to matched baseline data (LSR)
  - TP2 lower for MLE to tar and nicotine, and nicotine equivalents
  - TP3 higher for MLE to tar and nicotine, and nicotine equivalents
Conclusion - downswitchers

- 5% of subjects downswitched at TP2, increasing to 10% at TP3
- Downswitchers showed trends for
  - decreases in nicotine equivalents
  - a slight increased cigarette consumption at TP2, which was not maintained at TP3
  - small decreases in MLE to nicotine at both time points and MLE to tar at TP3 even though the variability was large

- Downswitchers when compared to matched baseline data (LSR)
  - at TP2 and TP3 lower for MLE to tar and nicotine, and nicotine equivalents

- Further time points might show whether the trends are developing
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