Introduction

• Most cigarette flavorings, such as grape and strawberry, were prohibited by the Family Smoking Prevention and Tobacco Control Act of 2009 (U.S. House), however, menthol remains an unregulated cigarette additive.
• Menthol has a unique cooling effect, which may cause smokers to inhale the smoke more deeply without feeling respiratory discomfort (TPSAC 2011).
• Menthol cigarette smoking is most prevalent among African Americans, youth ages 12-17, women of any age, and people who have recently started smoking (NSDUH 2009).
• In terms of quit attempts, studies have widely shown reduced success in smoking cessation in menthol cigarette smokers as compared to non-menthol cigarette smokers (Ghandi et al. 2009; Okuyemi et al. 2007).
• While menthol smokers have a more difficult time quitting smoking, the specific mechanism for this observation is unknown, though more severe withdrawal symptoms have previously shown to lead to reduced success in quit attempts.
• Therefore, we aim to examine the differences in withdrawal symptomatology in menthol versus non-menthol cigarette smokers during short-term smoking abstinence.
• It is hypothesized that menthol cigarette smokers will have more severe withdrawal symptoms than the non-menthol smokers during the short-term abstinence.

Methods

This is a secondary data analysis from a study titled “Menstrual Phase and Depressive Symptoms in Acute Smoking Abstinence” (PI: S. Allen), which aimed to determine the effect of depressive symptoms and ovarian hormones on withdrawal symptoms, nicotine craving, smoking urges, premenstrual symptoms, and cortisol levels during short-term smoking abstinence.

Eligibility Criteria

• Healthy women ages 18-40 with regular menstrual cycles
• At least 5 cigarettes/day for ≥1 year
• No exogenous hormones or psychotropic medications
• No recent or planned pregnancy or breastfeeding

Protocol

• Participants were assigned to a six-day testing week with two days of ad libitum smoking followed by four days of biochemically verified smoking abstinence, with symptomatology measures taken each day.
• Menthol status was determined on the first day of the study.

Figure 1. Data Collection Procedures

Table 1. Smoking-Related Symptomatology Measures

![Symptomatology Measures (MNWS & QSU) Taken Each Day](image)

Results

Table 2. Demographics and Smoking Behavior (n=221)

<table>
<thead>
<tr>
<th>Demographics</th>
<th>All (n=221)</th>
<th>Menthol (n=110)</th>
<th>Non-Menthol (n=111)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td>20.6 ± 5.6</td>
<td>20.2 ± 5.6</td>
<td>21.7 ± 5.5</td>
</tr>
<tr>
<td>Race (% White)</td>
<td>39.3 ± 0.90</td>
<td>40.5 ± 0.90</td>
<td>37.3 ± 0.90</td>
</tr>
<tr>
<td>Education (% Some College)</td>
<td>22.9 ± 4.75</td>
<td>22.9 ± 4.75</td>
<td>22.9 ± 4.75</td>
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<tr>
<td>Smoking-Related</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cigarettes/Day</td>
<td>12.9 ± 5.7</td>
<td>17.9 ± 7.5</td>
<td>11.3 ± 3.8</td>
</tr>
<tr>
<td>Days to First Cigarette (smokers)</td>
<td>20.6 ± 10.6</td>
<td>20.6 ± 10.6</td>
<td>20.6 ± 10.6</td>
</tr>
</tbody>
</table>

Figure 2. Absolute Values (Adjusted Mean ± Standard Error) of Withdrawal Symptoms by Menthol Status

![Figure 2](image)

Figure 3. Craving (MNWS) and Anticipated Relief from Negative Affect (QSU) Measures

![Figure 3](image)

Discussion

• Contrary to our hypothesis, non-menthol cigarette smokers showed more severe withdrawal symptoms during the short-term smoking abstinence.
• Further, menthol cigarette smokers showed higher withdrawal symptoms during ad libitum smoking.
• These data suggest that non-menthol smokers experience greater withdrawal during abstinence whereas menthol smokers experience greater withdrawal on an everyday basis.
• This analysis does not help to explain why menthol smokers have higher relapse rates than menthol smokers.
• This study included a large, diverse sample and was the first to examine differences in withdrawal symptoms between menthol and non-menthol smokers.
• However, this was a secondary data analysis project. An even larger study including both men and women should aim to primarily examine the differences between menthol and non-menthol cigarette smokers’ withdrawal symptoms during an actual smoking cessation to determine whether more severe withdrawal symptoms affect relapse rates.

References

• Cigarette smoking and depression among African American women. Nicotine & Tobacco Research, 9, 1229-1236.

Support

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