

Behavioral effects of nicotine in e-cigarettes do not correlate with cotinine levels

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ABSTRACT

This study was designed to determine whether nicotine in e-cigarettes alters reward sensitivity and whether dose is correlated with behavioral effects. Two groups of participants received either 6 mg/ml or 12 mg/ml nicotine while they played a video game, and differences between groups were found on video game performance. However, saliva samples of the major nicotine metabolite, cotinine, revealed no indication that the different dosages of e-cigarettes resulted in discernable differences in cotinine levels.

Highlights

- There were no significant differences in saliva cotinine levels between participants in the 6 mg/ml and 12 mg/ml nicotine groups
- Participants could reliably determine whether or not they had received the placebo dose
- There were significant differences in reward-related learning between the nicotine sessions and placebo sessions

Subjects:

18-25 year olds from the greater Burlington, VT area. Participants had exposed themselves to nicotine prior to the study but less than 100 times, and had not used nicotine within the month before entering the study. Participants were ineligible if they indicated substance abuse, psychological problems, or respiratory health-related problems.

Procedure:

- Participants were randomly assigned to one of two groups of EC dosages: 6 mg/ml (low) and 12 mg/ml (moderate).
- During each session, participants randomly received either their nicotine dose or a placebo dose
- Participants were guided through an “EC-puffing sequence” involving 3 sequences of 10 puffs each
- After the puffing sequence, participants were instructed to play a video game; performance on this video game provided various measures of reward-related learning
- Cotinine analysis occurred during a single nicotine session after at least a week long washout period
- Participants were tested for urine cotinine at the start of the session to ensure no recent nicotine usage
- Participants provided saliva samples 4 times throughout the session at different time points in order to measure the change in cotinine levels

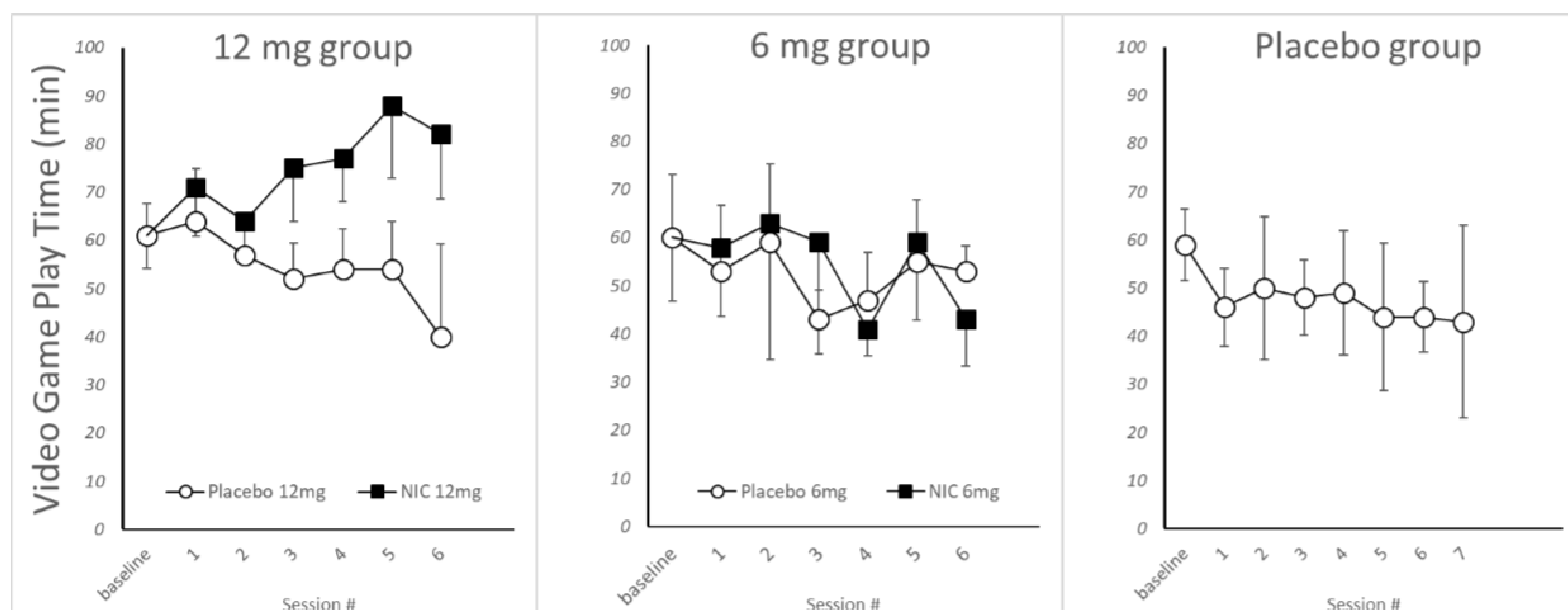


Figure 1. Primary dependent measure of reward sensitivity. Duration of overall video game play per session. Means and standard error are presented as a within-subject analysis.

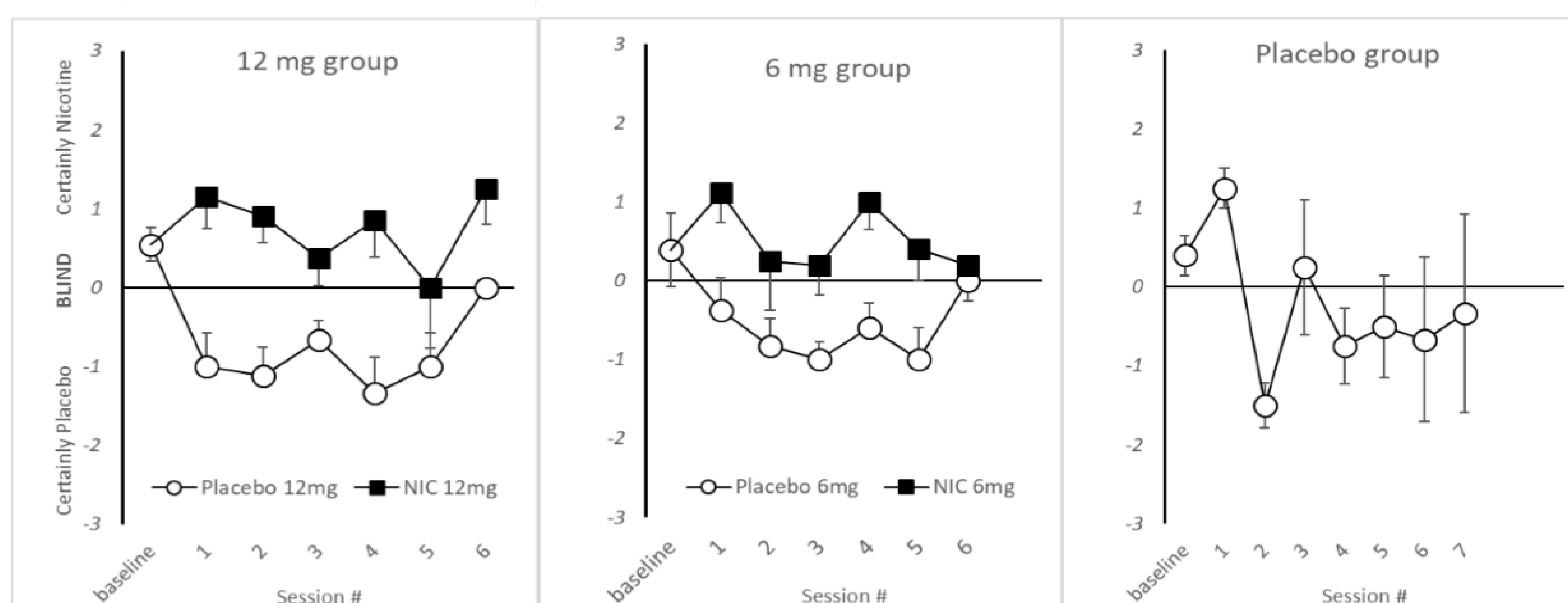


Figure 2. Blindness assessment. Subjective certainty of receiving the active drug (+3) versus certainty of receiving a placebo (-3), means and standard errors.

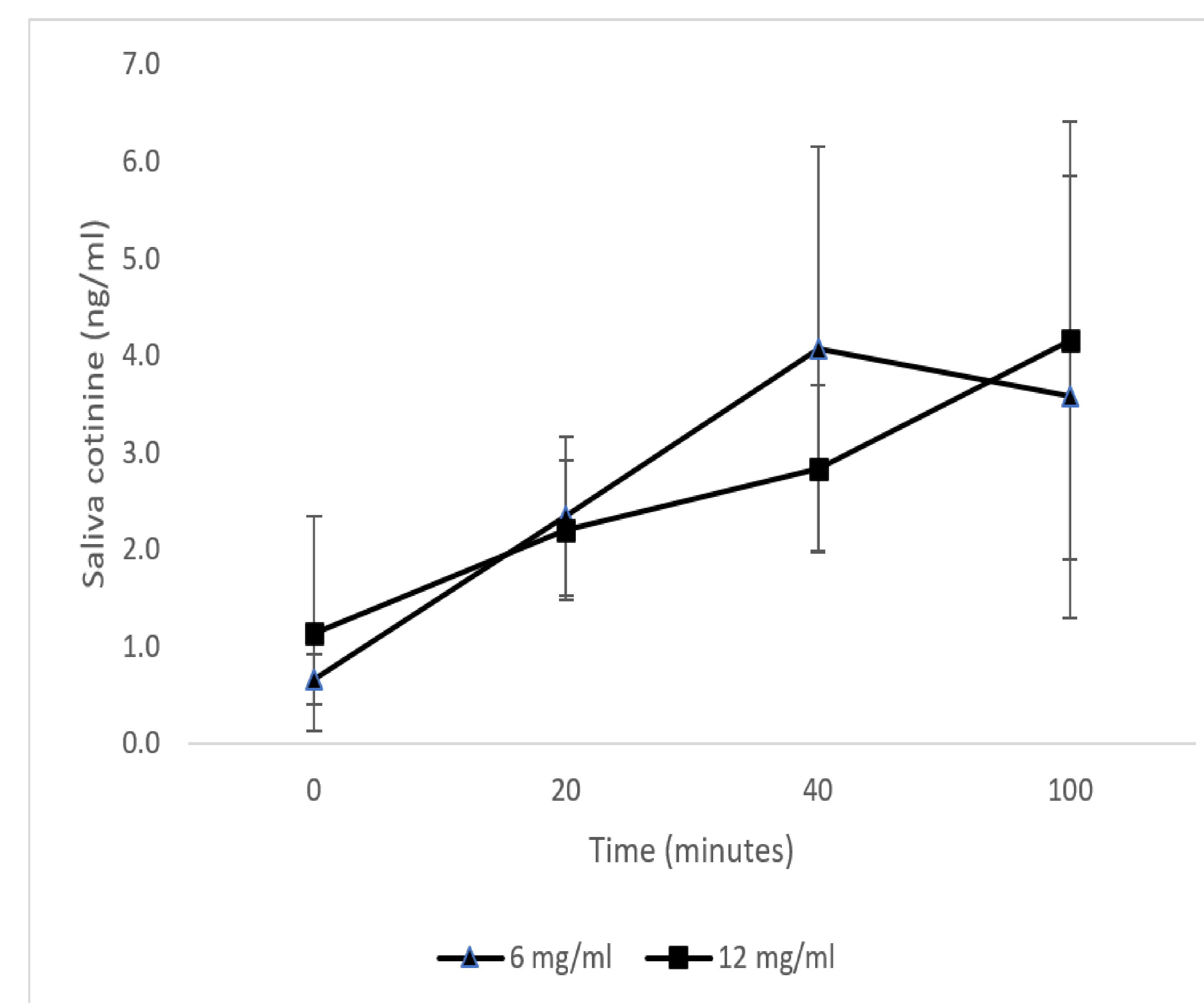


Figure 3. Saliva cotinine levels. Change in cotinine levels over a session, measured at 0 min, 20 min, 40 min, and 100 min. Means and standard errors.

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