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Oral oxycodone self-administration induces long-lasting increases in body temperature in rats

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The widespread use of oxycodone has led to sharp rises in opioid abuse in the United States. We have developed an oral oxycodone self-administration (OSA) model in rats. We hypothesize that oral oxycodone changes body temperature (BTemp) that persists into chronic withdrawal. As part of an ongoing genetic mapping study, we tested this hypothesis using 6 female and 8 male F2 offspring between the WMI and WLI inbred strains. BTemp was measured using the IPTT-300 transponders. After habituation to 1 h access to low concentration of oxycodone (0.025 mg/ml) under a fixed-ratio 5 (FR5) schedule, rats maintained stable intake of 0.1 mg/ml oxycodone (0.92 ± 0.06 mg/kg, $p>0.05$ for sex difference) during 4 h sessions tested every 48 h. An expected diurnal variation was observed in baseline BTemp. BTemp increased 0.95 ± 0.07 ℃ ($F_{5,49}=9.1$, $p<0.001$) immediately after OSA compared to baseline measured at the corresponding hour. The rise in BTemp remained even 44 hr later (0.49 ± 0.06 ℃, $F_{5,62}=2.3$, $p=0.06$). The increase in BTemp after OSA was correlated with oxycodone intake in males ($r=0.34$, $p=0.03$) but not in females ($r=0.19$, $p=0.33$), potentially because BTemp was also affected by estrus cycles. Together, these data suggest that BTemp change is a viable marker for acute and chronic effects of oral oxycodone intake in rats.