

Propofol Dosing in Cannabis Users: Insights from a Systematic Review and Meta-Analysis

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BACKGROUND

- The growing use of cannabis, especially tetrahydrocannabinol (THC), is influencing anesthesia in the U.S., where over 15% of the population consumes cannabis.
- High rates of cannabis use among preoperative patients have been reported, but the interaction between cannabinoids and anesthetic agents like propofol remains underexplored.
- Cannabinoids mainly interact with CB1, CB2, TRPV1, opioid, NMDA, and GABA receptors, affecting drug metabolism via cytochrome P450 enzymes.
- This interaction may alter propofol metabolism, requiring higher dosages.
- While some studies suggest increased propofol needs in cannabis users, others show no significant effect.
- Our review aims to synthesize current literature on propofol dosing in cannabis users.

METHODS

- We conducted a comprehensive search of databases including MEDLINE, Embase, and Google Scholar on November 20, 2023, retrieving 3,013 references.
- After screening 2,440 records, 78 full-text articles were reviewed, and eight met the criteria for data extraction.
- We included peer-reviewed studies on adult cannabis users and propofol requirements, excluding pediatric and non-human studies.
- Data collected included study design, sample size, cannabis use details, and anesthesia outcomes.
- A random-effects model was used for analysis, with I^2 and Cochran's Q statistics measuring heterogeneity.
- Sensitivity analysis was done using R software, and publication bias was assessed with funnel plots and tests.

RESULTS

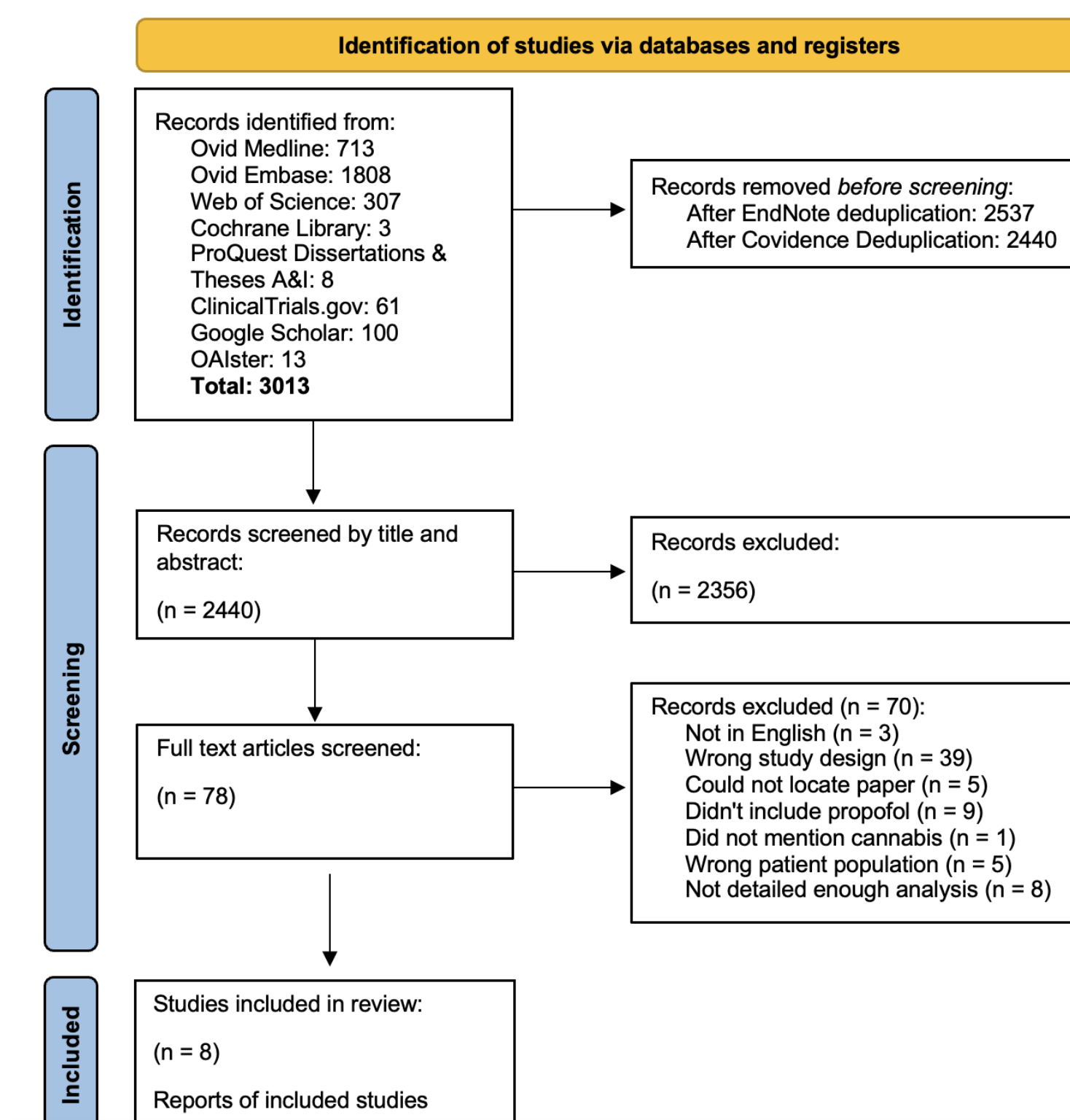


Figure 1. PRISMA flowchart for a systematic review of the effects of cannabis use on propofol requirements, conducted on November 20, 2023.

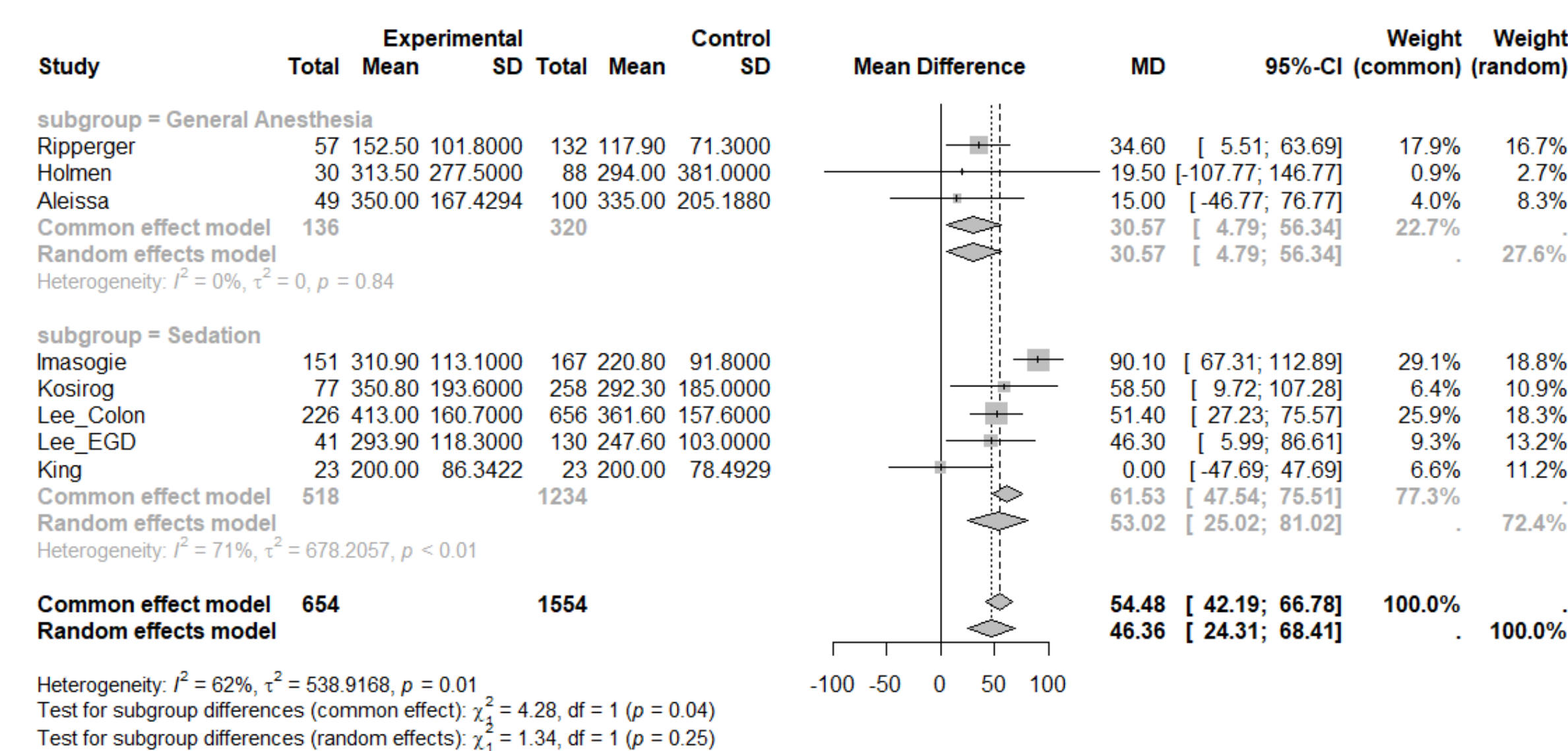


Figure 2. Sensitivity analysis showing the effect of cannabis use on propofol requirements intraoperatively during general anesthesia and monitored anesthesia care for endoscopic procedures separately.

DISCUSSION

- Cannabis users undergoing general anesthesia required an additional 31mg and those receiving MAC for endoscopic procedures additional 53 mg.
- Anesthesiologists should consider cannabis use history in preoperative assessments to determine the appropriate propofol dosage, with close intraoperative and postoperative monitoring.
- Limitations include potential selection bias, small sample size, and variability in study designs.
- Inconsistencies in cannabis use classification and propofol requirement definitions also affected data synthesis.

CONCLUSIONS

- We underscore the intricate interaction between cannabis use and propofol requirements, as cannabis users need more propofol during procedures.
- Future research should focus on controlled longitudinal studies, subgroup analyses for specific demographics, and molecular biology experiments.

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