The viability of a standard THC unit

Creating a standardized unit of cannabis presents different complexities to the framework used for alcohol units. This complexity involves the interactive effects of the bioactive compounds in the cannabis plant. Regardless, a standard unit calibrated to a low dose is important, not only for prevention, but also because positive effects of low cannabis doses may become negative effects at higher doses.

A standard unit for cannabis is important for both consumption and health guidelines. However, progress towards determining an adequate standardization approach is challenged by the complex factors related to cannabis’ effects. Freeman & Lorenzetti [1] advocated for the use of an alcohol standardization framework, which addresses: (1) the limitations of previously suggested approaches such as the use of mass weight of cannabis and (2) the considerations related to the heterogeneity of administration of use.

In an alcohol standardization framework, a standard unit of alcohol represents a fixed amount of pure alcohol, regardless of the volume of beverage. Thus, with all else being equal, a standard unit of alcohol would result in the same level of intoxication (e.g. US standard unit of alcohol = 14 g, UK standard unit of alcohol = 8 g). Applied to cannabis, this framework would label cannabis-based products according to tetrahydrocannabinol (THC) volume in mg. Unlike alcohol, however, standardization of plant-based products such as cannabis presents complexities, including the interactive pharmacological effects of other bioactive constituents in cannabis, such as cannabidiol (CBD), as discussed by Freeman & Lorenzetti. Although described as preliminary evidence in support of CBD’s protective effects against THC’s harms, there is growing recognition of CBD’s therapeutic potential independent of THC [2]. Indeed, some US states where THC has remained illegal, such as Texas, have adopted CBD laws for the indication of several medical conditions. In 2018, the Food and Drug Administration (FDA) approved the first CBD drug, Epidiolex, following convincing evidence of seizure control in pediatric epilepsy [3]. Keeping in mind that there are > 100 cannabinoids currently identified in cannabis, the interactive synergy between these compounds, referred to as the ‘entourage effect’, might also be critical for symptom relief in medical conditions beyond the isolated effects of THC or CBD [4]. It is, therefore, necessary to consider standardized units of cannabis compounds not only from a risk prevention perspective, but also from a therapeutic perspective, as new cannabis strains continue to emerge that narrow the gap between THC and CBD profiles.

Freeman & Lorenzetti recommended a standard unit of 5 mg THC, the lowest dose associated with subjective intoxication effects common across different modes of use (oral, inhalation, etc.). In addition to the rationale that a low standard dose may promote lower levels of average consumption, some studies suggest a paradoxical effect of THC, where positive effects at low doses result in negative effects in high doses. For example, a 2017 study showed that in comparison to placebo, 7.5 mg of THC significantly reduced self-reported subjective distress whereas 12.5 mg THC increased negative mood, impaired task performance and attenuated blood pressure reactivity to a stressor [5]. Similar effects have been noted in the treatment of pain where the lowest dosage of cannabinoids was associated with greatest relief from pain, while higher doses exacerbated pain [6]. These paradoxical effects have led to the recognition of a condition referred to as cannabinoid hyperemesis syndrome—severe, and uncontrollable vomiting—resulting from high THC cannabis use, whereas low-dose THC provides nausea relief in cancer patients [7]. These studies demonstrate that the therapeutic effect of THC can be optimal at lower doses. Low-dose THC also minimizes the potential for its intoxicating effects and the development of tolerance, and therefore could be beneficial for drug maintenance therapies.

In closing, given evidence that the effects of cannabis are dose-related, a standard unit system will allow cannabis dosage information to be communicated clearly to consumers and caregivers. It is critical, however, to address current and future impediments that might limit the utility of a standard unit.

Declaration of interests

None.

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