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This study analyzed the dose accuracy of labels from edible medical cannabis products dispensed in 3 US cities.

As the use of cannabis (marijuana) for medical purposes has expanded, a variety of edible products for oral consumption has been developed. An estimated 16% to 26% of patients using medical cannabis consume edible products. Even though oral consumption lacks the harmful by-products of smoking, difficult dose titration can result in overdosing or underdosing, highlighting the importance of accurate product labeling.
Cannabinoid Dose and Label Accuracy in Edible Medical Cannabis Products

As the use of cannabis (marijuana) for medical purposes has expanded, a need for clear, accurate labeling of products has been developed. An estimated 16% to 32% of patients using medical cannabis consume edible products.1,2 Although oral consumption lacks the harmful by-products of smoking, inaccurate dose titration can result in overdosing or underdosing, highlighting the importance of accurate product labeling. Regulation and quality assurance for edible product cannabinoid content and labeling are generally lacking. We investigated the label accuracy of edible cannabis products.

Methods | An Internet directory of dispensaries, with a menu of products available at each, was used to determine purchase locations in San Francisco, California, Los Angeles, California, and Seattle, Washington. A list of dispensaries was generated, with individual businesses randomly selected until 3 products were identified in each city that offered at least 1 edible cannabis product from each of 3 common categories (baked goods, beverages, candy or chocolate) with package labels that provided, at minimum, specific δ-9-tetrahydrocannabinol (THC) content.

Between August and October 2014, individual dispensary owners and staff members provided their written consent to participate in the study. All staff members were interviewed in their place of work and were provided with detailed instructions on product sampling and testing. Participants were instructed to purchase 1 package of each product category (baked goods, beverages, candy or chocolate) with a specified THC content, and to duplicate the purchase at another dispensary within the same city.

Products were considered accurately labeled if the measured THC and CBD content was within 10% of the labeled values, underlabeled if the content was more than 10% above the labeled values, and overlabeled if the content was more than 10% below the labeled values.

A χ² test was used (SPSS version 22; SPSS Inc) to evaluate effects of location on label accuracy. Significance was determined at P < .05 (2-sided).

Results | Of 72 products purchased from 47 different brands, 17% were accurately labeled, 23% were underlabeled, and 60% were overlabeled with respect to THC content (Table 1). The greatest likelihood of obtaining underlabeled products was in Los Angeles and overlabeled products in Seattle (χ² = 12.54, P = .00).

Non-THC content was generally low (Table 2). Forty-four products (59%) had detectable levels of CBD; only 7 had CBD content labeled. Four products were underlabeled and 9 were overlabeled for CBD. The median THC:CBD ratio of products with detectable CBD was 3.6:1, 7 had ratios of less than 10:1, and only 1 had a 1:1 ratio.

Discussion | Edible cannabis products from 3 major metropolitan areas, though unregulated, failed to meet basic label accuracy standards for pharmaceuticals. Greater than 50% of products evaluated had significantly less cannabinoid content than labeled, with some products containing negligible amounts of THC. Such products may not produce the desired medical benefit. Other products contained significantly more THC than labeled, placing patients at risk of experiencing adverse effects.5,6 Because medical cannabis is recommended for specific health conditions, regulation and quality assurance are needed. A limited number of cities, dispensaries, and products were included. Because no source lists all dispensaries, and many products are not labeled with cannabinoid content, a true random sample was not possible and the results may not be generalizable. However, this study illustrates the variability in label accuracy for edible cannabis products within 2 of the largest medical cannabis markets in the United States.

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