

# Marijuana as a treatment for epilepsy and multiple sclerosis?

## A “grass roots” movement

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Indian hemp, when pure and administered carefully, is one of the most valuable medicines we possess. —Queen Victoria’s personal physician<sup>1</sup>

The use of cannabis (marijuana) for medical purposes dates back almost five millennia. Western medicine publicly advocated marijuana’s medicinal properties in the mid-1800s; by the beginning of the 20th century, numerous articles in the medical literature recommended its use for a variety of disorders, including multiple neurologic conditions. The compound was available “over the counter” in pharmacies across the United States at that time.<sup>2</sup> Cannabis remained on US formularies until 1941. It was removed only after Congress passed the Marijuana Tax Act of 1937, which severely hampered physicians from prescribing it.<sup>2</sup> Currently in the United States, the drug is classified as a Schedule I drug under the Controlled Substances Act, thus criminalizing the use of this pharmaceutical agent.

In the United States, there have been numerous challenges to the laws that pertain to cannabis use for medical purposes. These challenges have resulted in 10 states allowing an exemption from criminal penalties for defined patients who possess and use medical marijuana under physician supervision. Alaska, Arizona, California, Colorado, Hawaii, Maine, Maryland, Nevada, Oregon, and Washington have adopted legal initiatives allowing medical cannabis use.<sup>3</sup> However, attempts continue at the federal level to ban any and all use of marijuana for medicinal purposes.

With all of the legal constraints and controversy surrounding the medical use of marijuana, one may expect a low rate of use in various medical populations in the United States. The situation is somewhat different in neighboring Canada, where, in July 2001, in response to an appellate court decision, Canada implemented the Marijuana Medical Access Regulations, clearly outlining the circumstances and

manner in which marijuana can be used therapeutically in that country.<sup>4</sup> According to Canadian law, appropriate patients for medical cannabis include those who have a terminal illness and are expected to die within the year and those with specific symptoms associated with certain medical conditions, including multiple sclerosis (MS), spinal cord injury, spinal cord disease, cancer, HIV, arthritis, and epilepsy. All patients must provide “a medical declaration that all conventional treatments have been reasonably tried or considered, and that the benefits of using marijuana outweigh any potential risks.”<sup>4</sup> Thus, it is not surprising to see studies of medical marijuana use originating from Canada. In this issue of *Neurology*, two such studies are reported.

Gross et al.<sup>5</sup> conducted a standardized telephone survey and chart review of patients in a Canadian tertiary care epilepsy center database and found that 21% of 160 participants had used marijuana in the past year, with 68% reporting beneficial effects on seizure severity and 54% reporting a decrease in seizure frequency. Twenty-four percent also responded that they “had heard” that marijuana is an effective treatment for their seizures. Moreover, 40% of the respondents would be willing to participate in a clinical trial evaluating the impact of marijuana on seizures.<sup>5</sup>

Clark et al.<sup>6</sup> surveyed tertiary care patients with MS to assess patterns and prevalence of cannabis use in Halifax, Nova Scotia. Of 220 patients, 72 (36%) reported the use of cannabis for any purpose, and 29 (14%) reported ongoing use for symptomatic management of their MS, namely, stress, sleep, mood, spasticity, and pain.<sup>6</sup>

Both of these studies demonstrate a high level of use of medical marijuana in Canada. Given the less restrictive attitudes in Canada toward medicinal use of marijuana, this may not be surprising. What is of concern, however, is the lack of evidence from ran-

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domized controlled trials demonstrating effectiveness of this treatment for epilepsy and MS symptoms.

The applicability of these studies to the United States is not clear given regional differences in attitudes toward cannabis and federal attempts to override state laws that permit its use for medical purposes. However, a recent survey of the Epilepsy Foundation of Arizona regarding alternative medicines frequently cited marijuana use for chronic seizures.<sup>7</sup>

There is limited scientific evidence regarding the efficacy of marijuana for the management of epilepsy or MS. Animal studies suggest that the active compound in cannabis,  $\Delta$ 9-tetrahydrocannabinol (THC), may suppress kindling, but other studies have reported proconvulsant effects.<sup>8</sup> Well-controlled clinical trials in epilepsy are at this time nonexistent. Although THC is purported to alleviate spasticity and muscle pain associated with demyelinating conditions, clinical trials of cannabinoids for this condition have included small numbers of patients and have reported inconsistent results.<sup>9</sup> A recent large study (CAMS study) compared oral cannabis extracts with oral THC and placebo for MS-related symptoms.<sup>10</sup> The trial failed to show a significant difference for its primary outcome measure, but many patients reported subjective improvements in pain, spasm, and sleep.<sup>9</sup>

The studies of Gross et al. and Clark et al. may raise more questions than they answer. Clearly, there is a “grass roots” movement, with many patients using cannabis for neurologic symptoms. Two large surveys, one from the Pew Research Center from 2001 and a 1999 Gallup poll, each showed that almost 75% of the US population support making marijuana legally available for medical purposes. However, to use marijuana effectively and safely for clinical purposes, we need to be able to study its use in appropriately designed and conducted clinical

studies. To do that, we must have a legal setting that permits unfettered scientific inquiry into the safety and efficacy of such a treatment. In the United States, that is not the case. As a result, some patients do not have approved access to a treatment that may prove beneficial, while other patients are surreptitiously using a treatment that may be of little value or actually cause harm.<sup>11–14</sup> Is marijuana “the most valuable of medicines we possess,” as Queen Victoria’s physician stated, or is it cruelly hoaxing on vulnerable patients who have lost hope?

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