Patterns of cannabis use among patients with multiple sclerosis

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Abstract—To estimate the patterns and prevalence of cannabis use among patients with multiple sclerosis (MS), 220 patients were surveyed in Halifax, Nova Scotia. Seventy-two subjects (36%) reported ever having used cannabis for any purpose; 29 respondents (14%) reported continuing use of cannabis for symptom treatment. Medical cannabis use was associated with male gender, tobacco use, and recreational cannabis use. The symptoms reported by medical cannabis users to be most effectively relieved were stress, sleep, mood, stiffness/spasm, and pain.

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Published reports spanning 100 years suggest that people with spasticity may experience relief with cannabis.[1] The epidemiology of cannabis use among patients with multiple sclerosis (MS) is not well described. A recent postal survey (60% response rate) of 420 patients with MS from southern Alberta, Canada in 2000 estimated that 16% of patients had used cannabis for therapeutic purposes.[2] We report the results of a 2002 survey in which we evaluated the patterns and prevalence of cannabis use in Halifax, Nova Scotia.

Methods. A cross-sectional questionnaire-based survey was designed to collect information on demographics (age, gender, years with MS, and medications used) and medicinal and recreational cannabis use. Subjective cannabis effects were documented using 5-point Likert scales on a range of symptoms, including spasticity, pain, mobility, sleep, and mood. Side effects experienced were recorded. Information on doses used, means of administration, frequency, and duration of use was collected. In addition, strength of commitment to use cannabis in the future was recorded. The Queen Elizabeth II Health Sciences Centre Research Ethics Committee approved the study protocol and questionnaire.

A sample size of 144 was calculated to be sufficient to detect an estimated prevalence of 10% with a 2.5% standard error. To account for 20% refusals and those who incorrectly filled in forms, we aimed to administer 175 questionnaires; 220 forms were prepared and administered at the study site.

Data were double entered and validated using standard procedures by a central data management agency (GEREQ, Quebec, Canada). Missing values constituting <5% of the total were not included in summary statistics. Analyses were conducted using statistical software (Stata version 8.0, Houston, TX).

Data are presented as summary statistics (means and medians) as appropriate. Ordered categorical data (e.g., degree of relief and severity of side effects) were summarized as proportions (e.g., number of patients indicating moderate to complete relief compared with total responses). The prevalence and patterns of cannabis use were estimated and analyzed by cross-tabulating the responses from medicinal cannabis users and others with respect to demographic characteristics. Continuous normally distributed data were compared using Student's t-test. Categorical data were compared using Pearson χ^2 tests. Ordered categorical data were analyzed using Mantel–Haenzel tests. Significance was set at the 95% level, and all tests were two sided.

Results. Two hundred five questionnaires were returned (93% response rate). The demographic characteristics of the subjects are shown in table 1. Subjects are shown categorized by their medicinal cannabis use status. Ever-use of cannabis for medical purposes was found to be significantly associated with male gender ($p = 0.03$), use of tobacco ($p < 0.001$), and recreational use of cannabis ($p = 0.009$).

Perceived effects and side effects. The 34 medical users rated the overall effectiveness of cannabis; more than half of these subjects reported cannabis as being very effective (2, not effective; 2, slightly; 10, somewhat; and 20, very effective). The perceived effectiveness of cannabis on individual symptoms is shown in table 2. Cannabis use was reported to reduce the number of doses of routine medication taken by 14 subjects, whereas 19 reported that cannabis had no effect on the number of doses of routine medication used.

Of the 34 medical cannabis users, 15 reported no overall side effects, 10 reported very mild side effects, 8 reported moderate side effects, and 1 reported strong side effects. No subject reported severe side effects. The most common side effect was "high," which was reported by 24 subjects, followed by drowsiness by 20, dry mouth by 14, paranoia by 3, anxiety by 3, and palpitations by 3.

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Table 1 *Demographic characteristics of 205 patients with multiple sclerosis by cannabis use*

	Medical cannabis use								
	Ever, n = 34		Never, n = 77		Missing, n = 94		Total		
Variable	n	%	n	%	n	%	n	%	*p* Value
Age in years									0.1
≤45 years	23	21	43	39	45	40	111	56	
>45 years	11	12	32	36	45	51	88	44	
Gender									0.04
Male	10	30	13	39	10	30	33	16	
Female	24	14	63	37	82	49	169	84	
Tobacco use									<0.001
Yes	24	39	21	34	16	26	61	30	
No	9	6	55	39	76	54	140	70	
Duration of MS									0.7
≤10 years	17	15	43	39	51	46	111	56	
>10 years	17	20	32	37	38	44	87	43	
Use of medication for pain/ mood/sleep/spasms									0.5
Yes	22	18	44	37	53	45	119	59	
No	12	15	31	38	39	48	82	41	
Recreational use of cannabis									0.009
Yes	19	26	53	72	2	3	74	36	
No	14	19	53	89	3	8	131	64	
Missing	1	1	5	5	89	94			

Nine subjects gave reasons why they had stopped using cannabis: three stated that obtaining it was too risky; two said cannabis had no effect at all; one reported that side effects were intolerable; and one said that symptoms had improved. No subject stated that symptoms got worse with cannabis use.

Patterns of cannabis use. Of 34 medical cannabis users, 15 reported only rare use, whereas 7 reported weekly use, 4 reported daily use, and 8 reported use more than once per day. Seventeen subjects had used cannabis in the past 24 hours; 4 had used in the past week; 3 had used in the past month; 5 had used in the past year; and 5 had not used in more than a year.

Thirty-two subjects gave information on single-dose size: the most common was an entire joint (14 subjects); three or four puffs at a dose was reported by 13 subjects; and one to two puffs was reported by 4 subjects. One subject stated that he smoked more than one joint per dose. Of the 12 who consumed cannabis orally, 11 stated that they used <1 g at each dose. The most common time of use was at night (29 subjects), followed by late afternoon (22), early afternoon (8), before noon (7), and morning (6).

Table 2 *Self-reported effects of cannabis on multiple sclerosis symptoms by 34 medicinal cannabis users*

Symptom	n	None-mild relief	Moderate-complete relief
Stress	21	1	20
Sleep	18	1	17
Stiffness	17	1	16
Mood	16	0	16
Spasm	15	1	14
Pain	12	2	10
Weight loss	5	1	4

Discussion. This survey demonstrates a prevalence of current medicinal cannabis use among patients seeking treatment at the MS clinic in Nova Scotia of 14%. This is consistent with data recently published from Alberta, Canada, which found a current use prevalence of 16%.[2] Medical use is reportedly effective for pain, stress, sleep, mood, and muscle spasm, consistent with reports from the United Kingdom and the United States,[3] as well as Canada.[2] The use of cannabis for stress and anxiety is reported in other populations, such as patients with HIV/AIDS and chronic noncancer pain, and emphasizes the need to better address these symptoms in clinical practice.[4]

Clinical trials of cannabinoids in MS have not been consistent in demonstrating beneficial effects. One small randomized controlled trial in 13 patients with MS found that doses of tetrahydrocannabinol (THC) >7.5 mg reduced patient reports of spasticity compared with placebo.[5] Reductions in tremor[6] and

pendular nystagmus[7] during cannabis smoking have also been observed.

In contrast, cannabis (1.54% THC) increased postural tracking errors among 10 patients with MS and 10 healthy control subjects, especially in the patients with MS.[8] In a recent randomized controlled trial of 16 patients comparing an oral cannabis extract with oral THC and placebo, cannabinoid treatment did not reduce spasticity or improve subjective impressions.[9]

A large randomized controlled trial (n = 660) recently compared the effects of oral cannabis extracts with pure oral THC and placebo. The study found no difference with respect to the primary outcome measure (modified Ashworth score) but did note significant subjective improvements in pain, spasm, and sleep.[10]

In the meantime, patients with MS continue to use cannabis to manage their symptoms. What can we learn from these patients? First, that pain and spasticity are not the only reasons for use, and the effects of cannabis on mood, sleep, and stress are important areas of therapeutic need and should be addressed in clinical trials. Second, there is a wide variance in doses used. Our study found doses ranging from single puffs to >1 g at a time. This may be explained in part by different potencies of available cannabis, with lower-potency preparations requiring larger doses, or by variation between individuals in tolerability or symptom severity. Clinical trials of cannabis for MS will need to include early dose-finding phases and allow for considerable intersubject variability in dose adjustments. Third, cannabis appears to be well tolerated, although some subjects experienced intolerable side effects and deterioration of symptoms. Access to cannabis emerged as an important obstacle in the use of this drug for medical purposes.

In conclusion, the current study found that patients with MS use cannabis for a range of symptoms. Health care providers should ask about, and be prepared to discuss, the use of this drug with their patients. Coupled with emerging evidence regarding the subjective effectiveness of cannabis on MS symptomatology, further exploration of the utility of cannabinoids in MS is warranted.

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