Efficacy of different varieties of medical cannabis in relieving symptoms

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Introduction

- Traditionally, cultivars of *Cannabis sativa* L. have been divided into sub-species based on their morphological properties, metabolic profile, and geographical origin. I
- As cannabinoid compounds like tetrahydrocannabinol (THC) and cannabidiol (CBD) are thought to be primarily responsible for the physiological effects of cannabis, unique strain profiles may provide different therapeutic benefits suitable for managing different symptoms and conditions.
- **Objectives**: To assess the efficacy of different cannabis varieties in patients. These results will allow physicians to better recommend different medical cannabis products to future patients more strategically to effectively meet their medical needs?

Materials and Methods

- Patients registered with a Canadian licensed cannabis provider were invited to complete a dynamic voluntary online survey upon registration (baseline), and at 4- and 10-month follow-up intervals.
- Information pertaining to current medical conditions, symptoms, and quality of life were collected.

Baseline

- The survey collected demographic information and information pertaining to current medical conditions and symptoms.

Follow-up

- Patients reported any changes they had experienced to their symptoms, conditions, or QOL.
- Patients reported which varieties of medical cannabis they attributed these changes to, if any.

Data analysis

- Cannabis varieties were categorized based on their approximate *sativa* and *indica* composition (Table 1).
- Patients who completed surveys between January 2015 and January 2017 were included in this analysis.
- Analysis was conducted including only patients who specified which medical cannabis varieties they used at follow-up.

Strain	Patients found most beneficial, n (%)	Composition	% THC	% CBD
Midnight[MR]	122 (18.7%)	sativa-leaning	8-11%	11-14%
Avidekel[MR]	89 (13.7%)	indica-leaning	0.1-0.8%	15-18%
Sedamen[MR]	61 (9.4%)	indica-dominant	21-24%	0
Luminarium[MR]	57 (8.8%)	sativa-dominant	25-28%	0
Cognitiva[MR]	51 (7.8%)	sativa-leaning	15-18%	0

Table 1: Properties of 5 most popular cannabis strains perceived to be most beneficial overall

Results

- 837 patients provided information about their experience with medical cannabis at 4-month follow-up.
- For pain reduction at 4-months, *Midnight[MR]*, *Sedamen[MR]*, and *Avidekel[MR]* were most effective.
- *Luminarium[MR]* (very *sativa*-dominant, 25-28% THC, 0% CBD) was most effective for managing both anxiety disorder (30.4%) and depression (35.5%).
- *Midnight[MR]* and *Sedamen[MR]* were also reported to be effective for depression and anxiety disorder.

Condition/symptom/QOL (Total n)	1st	2nd	3rd
Anxiety disorder (69)	*Luminarium[MR]* n=21 (30.4%)	*Midnight[MR]* n=19 (27.5%)	*Avidekel[MR]* n=15 (21.7%)
Sleep disorder (53)	*Eran Almog[MR]* n=17 (32.1%)	*Sedamen[MR]* n=17 (32.1%)	*Midnight[MR]* n=11 (20.8%)
Arthritis (46)	*Midnight[MR]* n=18 (39.1%)	*Avidekel[MR]* n=15 (32.6%)	*Sedamen[MR]* n=13 (28.3%)
Anxiety (341)	*Sedamen[MR]* n=93 (27.3%)	*Luminarium[MR]* n=86 (25.2%)	*Cognitiva[MR]* n=75 (22.0%)
Sleep problems (321)	*Luminarium[MR]* n=89 (27.7%)	*Midnight[MR]* n=79 (24.6%)	*Avidekel[MR]* n=65 (20.2%)
Depression (250)	*Luminarium[MR]* n=80 (32%)	*Avidekel[MR]* n=63 (25.2%)	*Alaska[MR]* n=50 (20%)
Headache (171)	*Midnight[MR]* n=53 (31%)	*Avidekel[MR]* n=40 (23.4%)	*Sedamen[MR]* n=39 (22.8%)
Exhaustion (164)	*Stellio[MR]* n=43 (26.2%)	*Luminarium[MR]* n=38 (23.2%)	*Sedamen[MR]* n=29 (17.7%)
Appetite (302)	*Midnight[MR]* n=75 (24.8%)	*Cognitiva[MR]* n=73 (24.2%)	*Sedamen[MR]* n=69 (22.8%)
Concentration (191)	*Cognitiva[MR]* n=42 (22.0%)	*Midnight[MR]* n=39 (20.4%)	*Avidekel[MR]* n=37 (19.4%)
Bowel function (175)	*Midnight[MR]* n=43 (24.6%)	*Sedamen[MR]* n=37 (21.1%)	*Avidekel[MR]* n=36 (20.6%)
Sexual function (170)	*Luminarium[MR]* n=45 (26.5%)	*Sedamen[MR]* n=44 (25.9%)	*Cognitiva[MR]* n=36 (21.2%)

QOL: Quality of life

Table 2: Top 3 cannabis strains associated with improvement in conditions, symptoms, and QOL.

Conclusions

- Most frequently reported cannabis strains effective for managing commonly reported conditions or symptoms such as depression, anxiety disorder, and pain include *Midnight[MR]*, *Luminarium[MR]*, and *Sedamen[MR]*.
- Cannabis strains most frequently reported to be effective for managing with pain include those with high CBD content such as *Avidekel[MR]* and *Midnight[MR]*.
- Limited quality scientific evidence exists to help patients and clinicians with appropriate strain selection.
- By identifying patient-perceived efficacies of different cannabis varieties, this study provides a platform for clinicians to make accurate product recommendations to patients presenting a variety of symptoms for which cannabis may be indicated.
- These results will contribute to the strategic design of future efficacy studies.

References

1. ElSohly MA, Slade D. Chemical constituents of marijuana: The complex mixture of natural cannabinoids. Life Sci 2005;78(5):539–48.
2. Grotenhermen F. The cannabinoid system-a brief review. J Ind Hemp 2004;9(2):87–92.
3. Ben Amar M. Cannabinoids in medicine: A review of their therapeutic potential. J Ethnopharmacol 2006;105(1–2):1–25.
4. Hazekamp A, Tejkalová K, Papadimitriou S. Cannabis: From Cultivar to Chemovar II—A Metabolomics Approach to Cannabis Classification. Cannabis Cannabinoid Res 2016;1(1):202–15.
5. Hazekamp A, Fischedick JT. Cannabis - from cultivar to chemovar. Drug Test Anal 2012;4:660–7.
6. Zhornitsky S, Potvin S. Cannabidiol in Humans—The Quest for Therapeutic Targets. Pharmaceuticals 2012;5:529–52.
7. Grotenhermen F, Müller-Vahl K. The Therapeutic Potential of Cannabis and Cannabinoid. Dtsch Arztebl Int 2012;109(29–30):495–501.
8. Hill K. Medical Marijuana for Treatment of Chronic Pain and Other Medical and Psychiatric Problems. Jama 2015;313(24):2474–83.