

Therapeutic Potential of Cannabinoids in Neurological Conditions in Clinical Trials

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Abstract

Overview: Cannabinoids have gained increasing attention for their therapeutic potential in treating several neurological conditions, including neurodegenerative diseases, chronic pain, and epilepsy. This review aims to assess the current clinical trials investigating cannabinoids, primarily THC and CBD, for neurological disorders. The focus is on the efficacy, safety, and outcome measures used in these trials. Methods: Clinical trials were identified using ClinicalTrials.gov, focusing on studies that examined the effects of cannabinoids in treating neurological conditions. Trials were included if they were Phase 1–4, focused on cannabinoids as primary interventions, and measured relevant outcomes such as pain relief, cognitive function, or spasticity reduction. Data on conditions, interventions, primary and secondary outcomes, and trial phases were extracted and analysed. Results: A total of 47 clinical trials were identified. The most frequently studied conditions were Multiple Sclerosis, Fibromyalgia, and Parkinson’s Disease. Most trials were in Phase 2, with the primary outcome measures focused on pain management, spasticity, and cognitive function. Secondary outcomes primarily included safety and tolerability measures. Thus, cannabinoids, particularly CBD, showed promising results in managing symptoms such as pain and spasticity. Conclusion: The study highlights the broad therapeutic potential of cannabinoids in neurology, with promising results in symptom management for conditions like Multiple Sclerosis and Fibromyalgia.

Materials & Methods

Data Source

This study used a secondary data analysis approach to evaluate the therapeutic potential of cannabinoids, specifically focusing on clinical trials involving CBD and THC for neurological conditions. The data were obtained from publicly available records on ClinicalTrials.gov, with trials being filtered based on their completion status and relevance to neurological disorders.

Data Collection

The methodology for identifying and selecting clinical trials involved a multi-step process, as illustrated in (Figure 1). Initial Screening: A total of 507,934 clinical trials were initially identified from ClinicalTrials.gov. After excluding irrelevant records, 67,640 trials focusing on neurological disorders were retained for further analysis. Cannabinoid-Specific Trials: From this subset, trials involving cannabinoid interventions were identified, leading to 132 trials. Further exclusions based on incomplete or irrelevant data, total of 47 completed clinical trials were included in the final analysis. The search on ClinicalTrials.gov initially identified 507,934 clinical trials. We applied specific search terms including 'cannabinoids', 'neurological disorders', and names of specific conditions like 'Multiple Sclerosis' and 'Parkinson’s Disease'. We further refined the search by setting filters for trial status to 'completed', phases to include 'Phase 1-4', and interventions specifically focusing on cannabinoids. We excluded trials that did not meet our inclusion criteria: studies that were not completed as of the data extraction date, those not explicitly focusing on cannabinoids as the primary intervention or lacking clear primary outcome measures related to the efficacy and safety in neurological conditions

Results

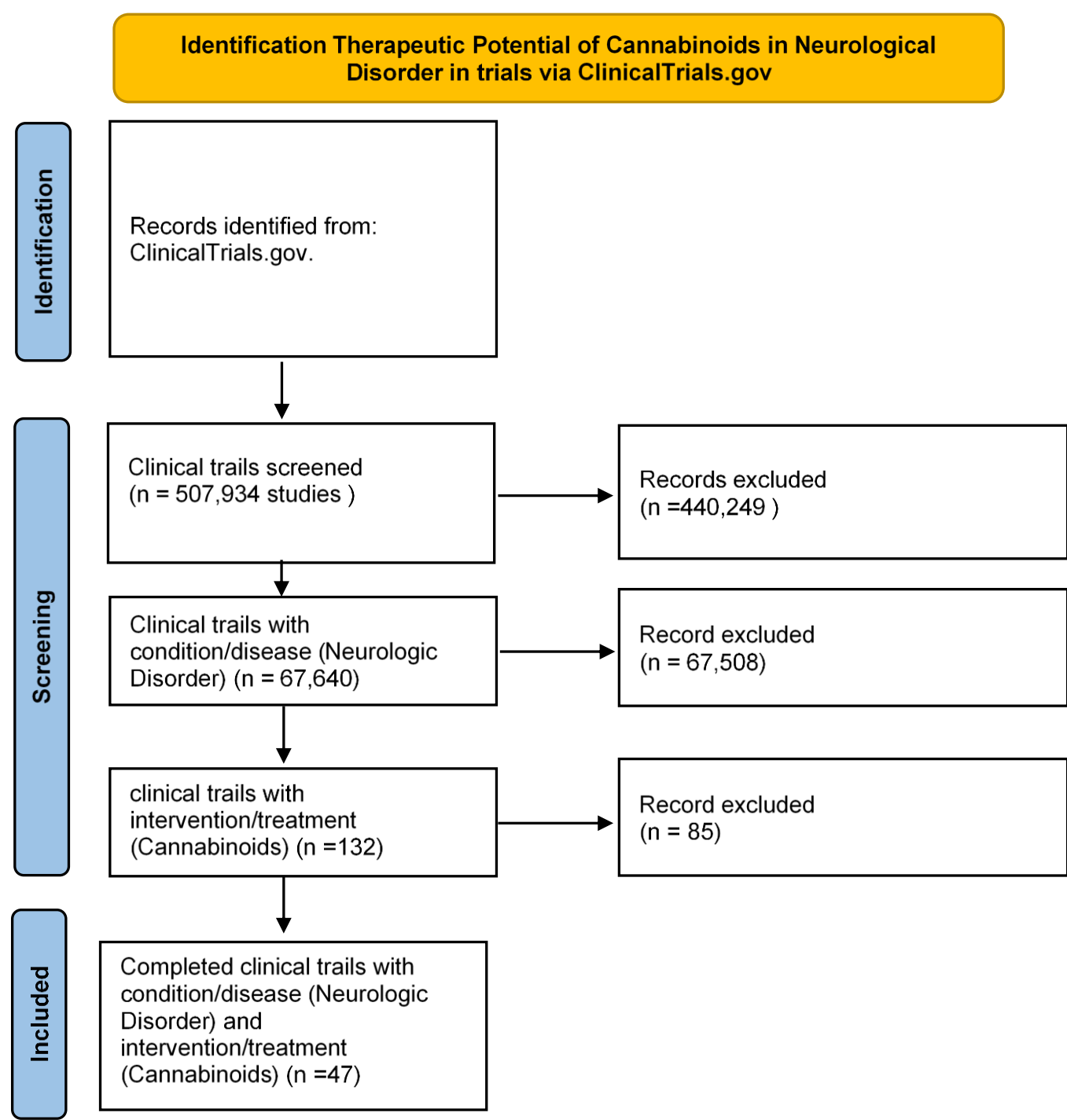


Figure 1:Methods used to Identify Therapeutic Potential of Cannabinoids in Neurological disorder

Characteristic	Details	Percentage (%)
Total Studies	47	100%
Most Common Conditions	Psychomotor Impairment	-
	Parkinson's Disease	-
	Fibromyalgia	-
Most Common Interventions	Nabilone	-
	Dronabinol	-
	CBD Oil	-
	THC	-
Study Phases	Phase not available (13 studies)	27.6%
	Phase 1 (3 studies)	6.3%
	Phase 1 & 2 (4 studies)	8.5%
	Phase 2 (18 studies)	38.3%
	Phase 2 & 3 (1 study)	2.1%
	Phase 3 (7 studies)	14.9%
	Phase 4 (1 study)	2.1%
Study Types	Interventional (45 studies)	95.7%
	Observational (2 studies)	4.3%
Age Categories	Adults and Older Adults (38 studies)	80.9%
	Adults only (6 studies)	12.8%
	Children & Adults (2 studies)	4.3%
Dosage	Varies by study (e.g., 10 mg to 600 mg per day for CBD)	
Duration of Treatment	Ranges from 4 weeks to 2 years, depending on the study	
Route of Administration	Oral, Sublingual, Topical, Inhalation	

Table 1: Summary of Clinical Trials
This table presents the key characteristics of 47 clinical trials that focused on the use of cannabinoids for treating various neurological conditions.

Aspect	CBD	THC	Details
Total Trials	6	7	Total number of trials involving each compound
Percentage of Total	(12.7%)	(14.9%)	Proportion of trials out of total studied
Conditions Studied	TMJ Disorder	Huntington's Disease	Specific conditions targeted by each cannabinoid
	Huntington's Disease	Dementia,	
	Migraine	Migraine	
	Essential Tremor	Essential Tremor	
	Neuropathic Pain	Neuropathic Pain	
Study Phases	Phase 2: 3 studies	Phase 2: 5 studies	Phases of studies involving each compound
	Phase 1/2: 1 study	Phase 1/2: 1 study	
Primary Outcome Measures	Pain severity	Pain intensity	Key outcomes measured in studies involving each compound
	Headache pain relief	Headache pain relief	
	Change in baseline pain (NRS)	Tremors mean amplitude (digital spirometry)	

Table 2 : CBD vs. THC Trials Comparison

This table compares the clinical trials that investigated CBD (Cannabidiol) versus THC (Tetrahydrocannabinol).

Conclusion

This analysis highlights the therapeutic potential of both CBD and THC in treating neurological disorders, particularly for pain, motor issues, and behavioral symptoms. THC may offer broader benefits but carries psychoactive risks, while CBD is safer and better suited for chronic pain, though possibly less effective overall. Future studies should address long-term safety and explore lesser-known cannabinoids and combination therapies.