The effects of medical marijuana on common symptoms seen in individuals with Multiple Sclerosis: a systematic review

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INTRODUCTON

- Multiple sclerosis (MS) is an autoimmune, inflammatory, demyelinating disease that is one of the most common neurological disorders in young adults, specifically ages 20-40.[1,2]
- Common symptoms include pain, visual problems, spasticity, fatigue, impaired gait, and bladder dysfunction, which can impact overall mobility and function in daily life.[3,4]
- Evidence indicates that current anti-spasticity medications are only partially effective and are commonly associated with adverse effects including sedation, weakness and cognitive issues.[5]
- Existing literature has shown a lack of evidence for the effectiveness of current antispasticity medications used in the treatment of MS.
- There is growing research regarding the use of medical marijuana for individuals with MS either as an add-on therapy or monotherapy.[5]
- Currently in the United States, 14 states and the District of Columbia have legalized adult recreational use of marijuana, while a total of 33 states, the District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands have legalized the use of medical marijuana.[6]
- 50-90% of patients with MS would consider using medical marijuana if it were legal and more evidence was available.[7]
- It is imperative to explore the efficacy of medical marijuana as an alternative treatment to decrease common symptoms seen in MS.

PURPOSE

- To evaluate the effectiveness of medical marijuana in treating common symptoms experienced by individuals with MS.

METHODS

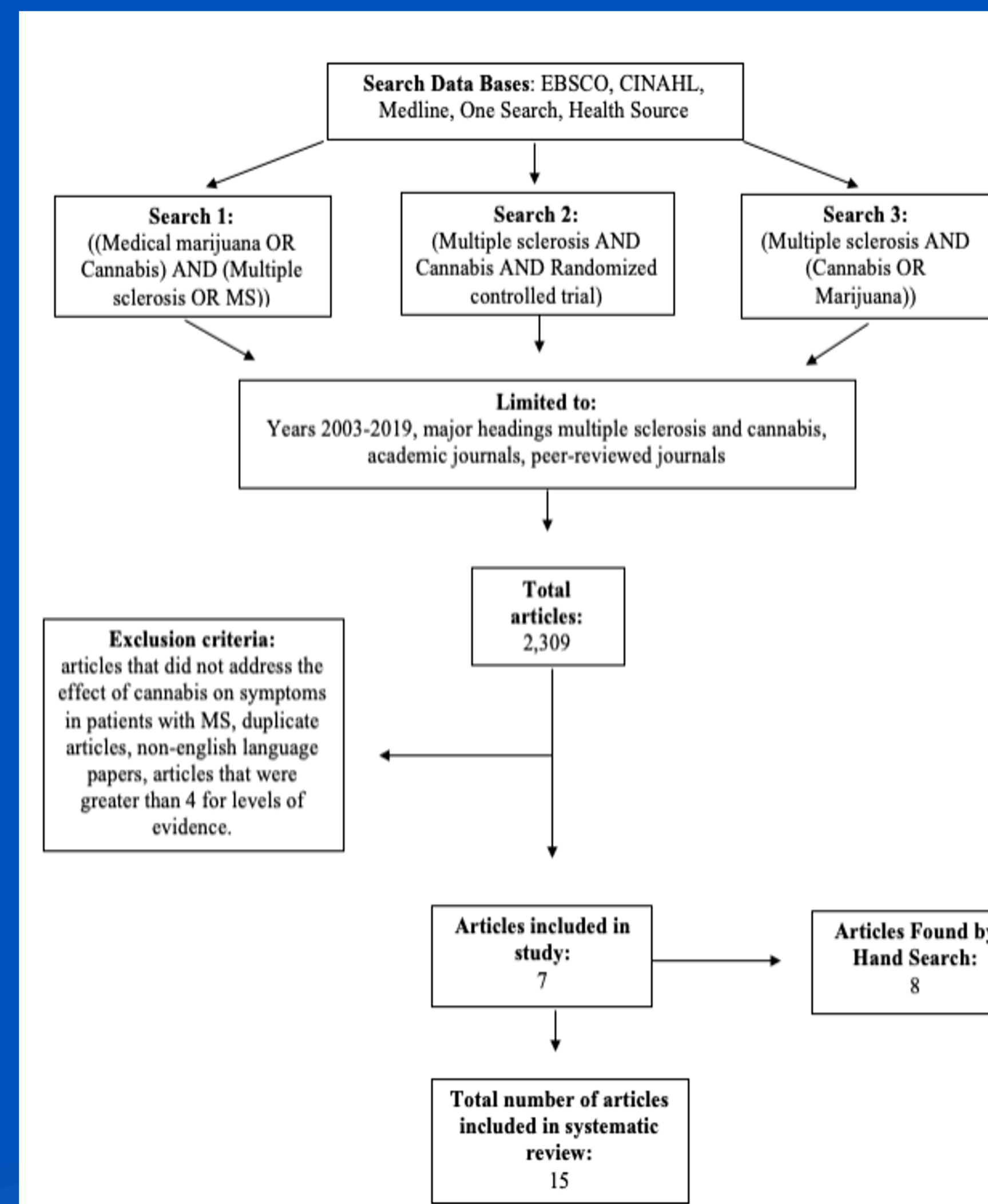- See Table 1 for databases used and number of articles retrieved from the search.

Table 1. Search Flow Chart

RESULTS

- Fifteen articles met inclusion criteria and were included in this systematic review.
- Primary outcomes across the literature included the effect of medical marijuana on pain, fatigue, physical performance, sleep, cognitive function, spasticity, spasm frequency, spatial-temporal parameters of gait, ease of transfers, kinematic parameters within the gait cycle, timed 10 meter walk test, frequency of bladder incontinence episodes, and tremor in individuals with MS.
- After analysis of the articles, the following themes were identified: spasticity, pain, physical performance, bladder function, and adverse effects.

DISCUSSION

- Spasticity[8-19]
  - Positive results seen in reduction of spasticity with medical cannabis.
  - Commonly used outcome measures were the Ashworth scale (and Modified Ashworth scale), Numeric Rating Scale, and Visual Analog Scale.
  - One study evaluated the combined effects of Nabiximols with PT, and found that PT was the main predictor of effectiveness of the Nabiximol treatment.
- Pain[10,11,13,17,19,22]
  - Generally positive results were seen in reduction of pain with medical cannabis.
  - Many studies used different combinations of cannabinoid extracts that authors found to be significant in reducing pain.
    - Nabiximols, cannabis extract of 2.5mg THC and 1.25mg CBD, THC extracts, CBD extracts, cigarettes with 4% THC.
- Physical Performance[9,10,13,15-20]
  - Results in the category of physical performance were generally indifferent.
  - Most studies used the Rivermead Mobility Index or Barthel Index and no significant differences were found between the cannabis and placebo group.
  - Few studies used the Ambulation Index, 10m walk test, or spatial-temporal parameters of gait; however, significant improvements were noted.
- Bladder Function[10,11,16,17,21,22]
  - Few studies investigated the effect of medical marijuana on bladder function.
  - Some studies found subjects to perceive an improvement, but results did not reach significance.
  - The main study in this category (Kavia et al.) did not find a statistical significance in their primary endpoint of reduction in number of daily incontinence episodes.
- Adverse Effects (AE)[8-22]
  - AE were reported in all studies; however most were mild to moderate, and no serious AE were reported in any studies.
  - Most common AE within all studies were:
    - dizziness, headache, fatigue, confusion, blurred vision, disturbed attention, drug toxicity.

IMPLICATIONS

- Medical marijuana may be an effective alternative treatment for some patients with MS, whose pain and spasticity are not well-managed with traditionally prescribed drugs.
  - Traditionally prescribed drugs for spasticity include baclofen, tizanidine, dantrolene, etc. and side effects of these are muscle weakness, sedation, and fatigue.[23]
  - Traditionally prescribed drugs for bladder function include anticholinergics and side effects of these are dry mouth, blurred vision, constipation, and cognitive dysfunction.[24]
- Medical marijuana can also potentially improve gait quality and walking speed for patients with MS.[11,20]
  - Walking speed and ability are key indicators for disease progression in people with MS, and are assessed best with the Timed-25 foot walk and Expanded Disability Status Scale.[25,26]
  - Research is needed to determine whether medical marijuana could possibly even slow motor deterioration in MS and elucidate likely responders.
- Low to moderate AE were found overall, and are generally not worse than side effects seen with other prescribed symptomatic drugs.
  - When researchers incorporated self-titration, subjects were more consistently able to achieve optimal dosing of medical marijuana, while minimizing adverse effects.[9,16]
- Future research is needed to examine the interaction of medical marijuana use and physical therapy intervention, in terms of both safety and efficacy.

CONCLUSION

- This systematic review provides evidence to support the use of medical marijuana to manage common MS symptoms. Strongest evidence was found for reductions in pain and spasticity.
- Further research is necessary to identify the extent of which medical marijuana is able to improve function and quality of life for individuals living with MS.