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Dry Needling for Relief of Spasticity in Patients with Chronic Stroke: An Evidence Synthesis

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DRY NEEDLING FOR RELIEF OF SPASTICITY IN PATIENTS WITH CHRONIC STROKE: AN EVIDENCE SYNTHESIS

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INTRODUCTION

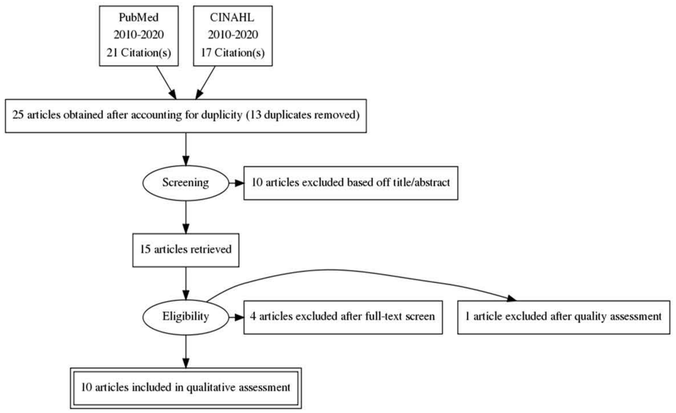
Spasticity is a common symptom in patients with a history of stroke with a 20-30% prevalence rate.[1] Spasticity is defined as a muscles resistance to stretch that is velocity-dependent, due to the hyperexcitability of the stretch reflex.[2] A variety of daily and functional tasks are affected by spasticity, with a primary impact on upper extremity function and ambulation. Spasticity is most commonly treated pharmacologically.[3] While medications offer potential benefit for physiological reduction in muscle tone, inhibition is often accomplished in conjunction with a variety of adverse side effects. Thus, non-pharmacological treatment options, such as dry needling, are being sought out to offer relief of spasticity. Current research is limited but emerging regarding the efficacy of dry needling on improving spasticity in patients with a history of stroke. **The purpose of this research is to evaluate the effectiveness of dry needling for relief of spasticity in patients with chronic stroke.**

METHODS

Search Strategy

- PubMed and CINAHL databases
  - "Dry needling" AND "stroke"

Figure 1. PRISMA flowchart



- Inclusion Criteria: Studies involving human participants with a history of stroke and corresponding spasticity
- Exclusion Criteria: Spasticity caused by other neurological conditions; studies published prior to 2010
- Quality Assessment: Joanna Briggs Institute Critical Appraisal Checklist for Case Reports[4] and Randomized Controlled Trials[5]

RESULTS

Study Characteristics

- Subjects: All participants had a history of stroke resulting in hemiparesis and spasticity
  - Sample size range: 1-34 participants
  - Mean age range : 48-60 years old

Muscles Treated

- Upper Extremity: Upper trapezius, infraspinatus, subscapularis, pectoralis major, biceps brachii, pronator teres, flexor carpi ulnaris, dorsal surface of the hand
- Lower Extremity: Rectus femoris, semitendinosus, biceps femoris, tibialis anterior, tibialis posterior, gastrocnemius

Interventions

- Dry needling as the sole intervention [6,7 8, 9, 10, 11]
- Dry needling followed by 15 minutes of electrical stimulation to the wrist extensor muscles[10]
- Standard rehabilitation to both groups (treatment and control), while only the treatment group received dry needling[12]
- Bobath treatment to both groups (treatment and control), while only the treatment group received dry needling[13]

Intervention Protocol

- Fast-in fast-out [6, 8, 9, 10, 11, 12, 13, 14, 15]
- One minute of dry needling per muscle [6, 8, 9, 10, 12]
- 45-60 seconds of dry needling per muscle[13]
- 25-30 seconds of dry needling per muscle[12]

Outcome Measures

- Modified Modified Ashworth Scale (MMAS) [6, 8, 9, 10, 11, 12, 13, 14, 15]
- Brunnstrom Stages[6, 9]
- Pain Pressure Thresholds[10]
- Tensiomyography[7]
- Hmax/Mmax ratio and H reflex latency[8]
- Passive Force Resistance Force (PRF) and Box and Block test (BBT)[8]
- Computerized Dynamic Posturography[11]
- Fugl-Meyer scale[11]

Assessment

- Single follow-up[6, 10, 11, 15]
- Multiple follow-ups[7, 8, 9, 13, 14]
- One time per week for three weeks[13]
- One week, immediately after third session, and one-month later[12]

CONCLUSION

For treating spasticity in patients with chronic stroke, dry needling is emerging as an effective treatment option. More robust research is needed to assess effectiveness of dry needling. Future research may establish clinical practice guidelines for proper implementation of dry needling in treatment of spasticity for patients with chronic stroke.

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Application of Dry Needling and Follow-up Listed Across Days

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	...	35	...	42
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Salom-Moreno et al.(2014)	DN, A																																	
Sánchez-Mila et al. (2018)	DN, A																																	

DN = Dry Needling, A = Assessment