



Systematic Review

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Systematic Review on Ayurveda and Complementary Medical Intervention for Cerebrovascular Accidents

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ABSTRACT

A Cerebrovascular Accident (CVA), commonly known as a stroke, is characterized by the sudden death of brain cells resulting from insufficient oxygen caused by the blockage or rupture of a cerebral artery leads to a disruption in blood flow to the brain[1]. The primary clinical manifestation, hemiplegia manifests as a neurological deficit impacting the face, limbs, and trunk unilaterally or bilaterally. Paralysis results from damage to the pyramidal tracts or upper motor neurons responsible for voluntary movement, caused by lesions, trauma, ischemia, or hemorrhage [1]. Ayurveda correlates CVA with the term '*Pakshaghata*,' attributing its onset to the vitiation of *Vata Dosh*a [2]. CVA is a leading cause of deaths and adults disability in worldwide3. **Materials & Methods:** This study aimed to systematically review Randomized Control Trials (RCTs) on the effectiveness of Ayurveda and Complementary Medicine for CVA. The PubMed, EMBASE, Cochrane Library, PMC, MEDLINE, Science direct, Research gate databases and AYU Journal, International Ayurvedic Medical Journal, International Journal of Scientific Research, Evidence- Based Complementary and Alternative Medicine, Journal of Ayurveda and Integrated Medical Sciences, Stroke AHA Journal were searched in open access from 1999 to 2019. All the full papers of RCTs were included to perform the analysis for assess the quality of each included RCTs by using Jadad Score. **Results:** Total 38 RCTs were met inclusion criteria with 9 Ayurveda medical research articles, 24 Traditional Chinese Medicine and Acupuncture research articles, and 5 other Complementary Medical system research articles. There are six research articles have scored highest, 5 points in Jadad Score which interventions of these high quality researches were proved as valid, reliable, and effective in management of CVA significantly by their results and conclusions. **Conclusion:** Well-planned RCTs should be performed on CVA in the future, to get better treatment modalities and improve the present treatment modalities.

Keywords: Ayurveda medicine, Cerebrovascular Accidents, Complementary Medical Intervention, Hemiplegia, Pakshaghata.

INTRODUCTION

According to the World Health Organization, in 2019 reported stroke as the second leading cause of global deaths, representing 11% of total annual fatalities [3]. Globally, 15 million people annually undergo a stroke, resulting in 5 million deaths and an additional 5 million individuals enduring disabilities [4]. Concurrently, according to 2019 Sri Lankan health statistics, Cerebrovascular Accident (CVA) emerged as the fifth leading [5] cause of hospital deaths, especially in the middle and later stages of life. This situation poses a considerable healthcare burden, notably in the context of limited resources [6]. Ayurveda correlates CVA with the term '*Pakshaghata*,' attributing its onset to the vitiation of *Vata Dosh*a [2]. The critical demand for effective treatment modalities and drug preparations to address the complications of CVA is evident. Current treatment patterns require validation to both save lives and reduce associated complications. Scholars in Conventional Medicine, Ayurveda, and Complementary Medicine have conducted numerous studies on CVA, and their outcomes are presently applied in patient treatment. In Ayurveda medicine, among traditional medical systems, demonstrates higher efficacy in treating CVA globally compared to Allopathic medicine. Emphasizing evidence-based clinical practice for enhanced patient outcomes and cost-effectiveness, Randomized Control Trials (RCTs) gain prominence across clinical medicine domains. Despite their cost and time intensity, RCTs are considered the gold standard for epidemiological studies, minimizing bias and providing a robust foundation for testing medical interventions [7]. Their results, aggregable through systematic reviews and meta-analyses, contribute to evidence-based decision-making in clinical practice [8]. The ongoing study aims to systematically review RCTs evaluating the effectiveness of Ayurveda and Complementary Medicine in treating CVAs. The insights gained are intended to benefit Ayurveda General Practitioners, researchers, drug manufacturers, acupuncturists, and policymakers. This review seeks to aid in the development of updated treatment modalities for CVA within these medical practices.

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MATERIAL AND METHODS

Research Design: Systematic Review

Data Collection: Electronic and manual searching through the open access media and Journals, all the articles in Ayurveda medicine, Unani Medicine, Traditional Chinese Medicine, Acupuncture, Traditional Korean Medicine and Complementary Medicine within the period from 1999 to 2019 on the topic of CVA.

Electronic searches: In Databases- PubMed, EMBASE, Cochrane Library, PMC, MEDLINE, Science direct, and Research gate. Open access journals- AYU Journal, International Ayurvedic Medical Journal (IAMJ), International Journal of Scientific Research (IJSR), Evidence- Based Complementary and Alternative Medicine, Journal of Ayurveda and Integrated Medical Sciences (JAIMS), and Stroke-American Heart Association Journal.

Manual searches: Sri Lanka Journal of Indigenous Medicine (SLJIM), *Ayurveda Sameeksha*, Journal of Ayurveda and Integrative Medicine, and Journal of *Ayush*.

Key words- Ayurveda Medicine, Acupuncture, Complementary Medical Interventions, CVA, Cerebro- Vascular Accidents, Cerebro- Vascular Diseases, Hemiplegia, Herbal Medicine, *Pakshaghata*, *Pakshvadha*, Stroke, Systematic Review, Traditional Chinese Medicine, Traditional Korean Medicine, Unani Medicine.

Identification of Eligible Research Articles:

Inclusion criteria:

- RCTs - Patients who are diagnosed with stroke (acute, chronic, ischemic or haemorrhagic etc.) adult age (20- 90 years), both sex (female and male), and any race.
- Full texts only.

Exclusion criteria:

- Conventional Medical researches on CVA.
- Literature Reviews, unavailable full texts or abstracts papers, Non-Randomized trials, case studies, animal studies or in vitro studies, observational studies, systematic reviews and duplicate articles on CVA.

Data extraction:

- General Information: Title, Author (s), Year of Publication.
- Trial Characteristics: Study design, Randomization, Methods of randomization, Blinding, Duration of follow up.
- Interventions: Main intervention (dose, route and timing), Comparison or placebo intervention (dose, route and timing), and other co- medications (dose, route and timing).

- Patients: Inclusions and Exclusion Criteria, Number of the patients in each group, Diagnostic criteria, Withdrawal or loses the follow up (reason, duration).
- Outcomes: Observations, Primary and Secondary outcomes, Scales or scores which used for assessing outcomes.
- Results and conclusions were extracted.

Assessing score system: Jadad Score [9].

Table 1: Accepted structure for 'Jadad Score' calculation [9]

Item	Score
Was the study described as randomized (This includes words such as randomly, random and randomization)?	0/1
Was the method used to generate the sequence of randomization described and appropriate (Table of random numbers, computer generated, etc.)?	0/1
Was the study described as double blind?	0/1
Was the method of double blinding described and appropriate (Identical placebo, active placebo, dummy, etc.)	0/1
Was there a description of withdrawals and dropouts?	0/1
Deduct one point if the method used to generate the sequence of randomization was described and it was inappropriate (Patients were allocated alternately or according to birth, hospital number etc.)	0/-1
Deduct one point if the study was describes as double blind but the method blinding was inappropriate (e.g.- Comparison of tablets vs Injection with no double dummy)	0/-1

RESULTS & DISCUSSION

In the study encompassing a span from 1999 to 2019, a total of 149 research articles available in open access were gathered. Out of this pool, thirty-eight (38) RCTs were selected for quality assessment (Figure 1).

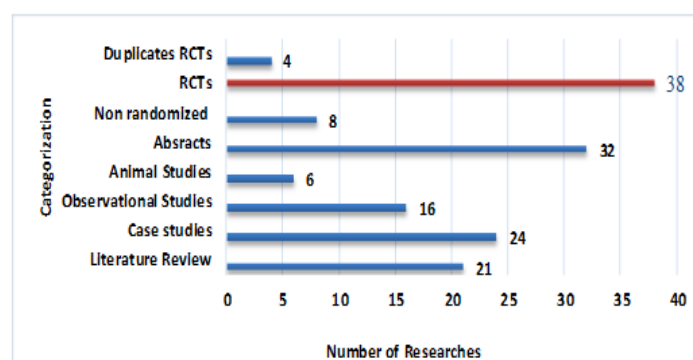


Figure 1: Bar Chart representing the total collected articles for the study

Among these 38 RCTs, 24 were classified as high-quality, meeting rigorous standards. A detailed analysis using the Jadad score revealed that 14 RCTs scored 3 points, indicating a noteworthy proportion achieving a commendable level of quality. Furthermore, four research articles secured a score of 4 points, while six research articles obtained the highest score of 5 points according to the Jadad scoring system (Figure 2).

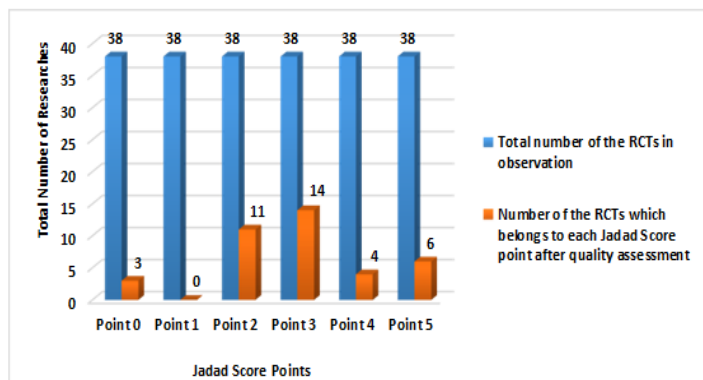


Figure 2: Bar chart representing the RCTs points according to the Jadad score

In the categorization of Randomized Control Trials (RCTs) across different medical systems, Traditional Chinese Medicine (TCM) predominates, followed by Ayurveda, Traditional Korean Medicine (TKM), Traditional Thai Medicine (TTM), Traditional Myanmar Medicine (TMM), and Unani medicine, each having an equal number of representation (Figure 3). Specifically for Ayurveda, a total of 9 research articles were identified among the 38 RCTs. The majority of these, five research articles, scored 2 points, while three research articles scored 0 points, placing a total of eight research articles in the low-quality category. Only one research article achieved a score of 3 points, qualifying for the high-quality category, with no RCTs scoring 4 or 5 points according to the Jadad Score. In TCM, a total of 24 research

articles were discovered among the 38 RCTs. The majority of these, eleven research articles, scored 3 points, while three scored 4 points, and five scored the highest possible 5 points. Impressively, 19 research articles fell into the high-quality category, with only five research articles categorized as low quality according to the Jadad Score. Among other complementary medical research articles related to TKM, TTM, and TMM, a total of 5 articles were identified, with 4 falling into the high-quality category. TTM and TMM research articles scored 3 points, while one TKM research article achieved the highest score of 5 points in the Jadad Score. Additionally, only one research article related to Unani medicine scored 2 points (Figure 3).

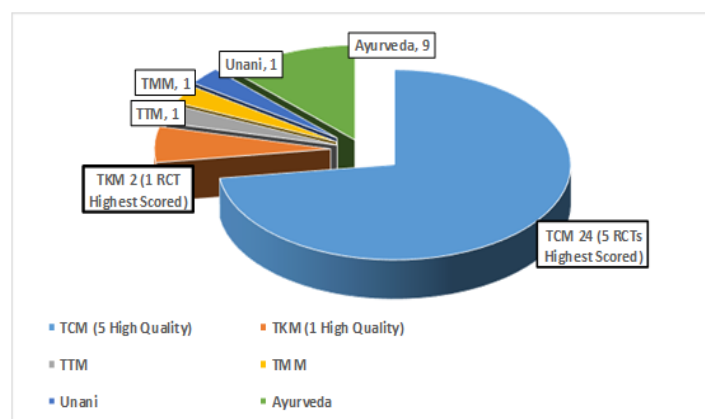


Figure 3: Distribution of the RCTs according to different medical system

This comprehensive classification offers a detailed overview of the distribution and quality assessment of RCTs across diverse medical systems, providing valuable insights into the landscape of evidence-based research in these fields. Evaluation of the high-quality research articles also provides a foundation for further analysis and conclusions as shown in table 2.

Table 2: Detailed description of the high quality RCTs in the study

No	Name of the Author	Title of the Research Article	Name of the Journal	Interpretation of the study results
1	Gong B <i>et al.</i> ^[10]	Safety and efficacy of the C-117 for vulnerable carotid artery plaques (<i>Spchim</i>): a randomized double-blind controlled pilot study.	Evid-based Alt Med.2019	C-117 is an effective TCM herbal formula in treatment of carotid atherosclerotic vulnerable plaques in stroke patients.
2	Kwon S <i>et al.</i> ^[11]	Study on the evaluation of various types of sham acupuncture treatments in hemiplegic stroke patients: the protocol of a randomized clinical trial.	Evid-based Alt Med.2019	Protocol for exploring verum acupuncture, Park <i>Sham</i> Device acupuncture, <i>Steinberger's</i> needle acupuncture, insertion- and removal-type acupuncture. The study's results will be used to standardize current acupuncture treatments for hemiplegic stroke patients and assess the optimal sham acupuncture device for future clinical studies.
3	Jia J <i>et al.</i> ^[12]	Efficacy and safety of the compound Chinese medicine <i>SaiLuoTong</i> in vascular dementia: a randomized clinical trial, Alzheimer's & Dementia.	Trans Res Clini Int.2018	<i>SaiLuoTong</i> (SLT), a Traditional Chinese Medicine (TCM) formula, in a capsule form has potential benefits in improving cognition and daily functioning for Chinese patients with mild to moderate Vascular Dementia after a stroke.
4	Chen C <i>et al.</i> ^[13]	<i>Danqi Piantang Jiaonang</i> (DJ), Traditional Chinese medicine,	AHA Journal.2009	Evaluate the superiority the efficacy and safety of <i>Danqi Piantang Jiaonang</i> (DJ) and <i>Buchang Naoxintong Jiaonang</i>

		in post stroke recovery. Stroke		(Traditional Chinese Medicine drugs) in individuals with recent ischemic stroke utilization of results findings for future treatments for cerebrovascular accidents (CVA).
5	Chen CL <i>et al.</i> ^[14]	Chinese medicine neuroaid efficacy on stroke recovery (a double blind, placebo controlled, randomized study.	Stroke AHA Journal.2013	MLC601 (NeuroAid), a Traditional Chinese Medicine demonstrating its neuroprotective and neurorestorative actions in the context of acute stroke recovery.
6	Wei D <i>et al.</i> ^[15]	The positive effects of <i>Xue Shuan Xinmai</i> tablets on brain functional connectivity in acute ischemic stroke: a placebo controlled randomized trial.	Sci Rep.2017	<i>Xueshuan Xinmai</i> tablets (a TCM drug) is potential for neurologic deficits, quality of life and brain functional connectivity in acute ischemic stroke patients results, they have mentioned that future longitudinal studies are suggested to confirm the study

CONCLUSION

In conclusion, the discerning evaluation employing the Jadad score has identified six research articles characterized by a remarkably high level of methodological excellence, achieving the maximum score of 05. The RCTs conducted in the Traditional Chinese Medical and Traditional Korean Medical systems, as well as Acupuncture therapy, emerge as exemplars of reliability and effectiveness. These trials exhibit not only resilient study designs but also a notable absence of serious side effects. Conducting high quality RCTs for the treatment modalities in the Ayurveda system of medicine, for CVA or *Pakshaghta*, is crucial.

Conflict of interest

There is no conflict of interest.

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