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Expert Perspectives on the Clinical Use of Piracetam and Citicoline in Stroke and Piracetam Monotherapy in Treating Vertigo

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Abstract

Objective: To gather clinicians' perspectives on the clinical use of piracetam and citicoline in stroke and piracetam monotherapy in treating vertigo in Indian settings.

Methods: This cross-sectional study was conducted among clinicians across Indian settings and focused on theclinical practices, preferences, and experiences on the combination of citicoline and piracetam for stroke, and piracetam alone for vertigo. Participants independently completed the 24-item questionnaire after providing informed consent. Descriptive statistics were used to analyze the data, with categorical variables presented as percentages and visualized through pie and bar charts in Excel.

Result: The study involving 490 participants identified hypertension as the most common risk factor for stroke in young Indian patients (58%). Half of the respondents reported reduced quality of life post-stroke, while 76% supported piracetam and citicoline as effective neuroprotective agents. Citicoline's role in restoring mitochondrial ATPase and membrane Na+/K+ ATPase was emphasized by 48% of experts. Most participants reported common dosages of 800 mg piracetam and 500 mg citicoline (87.55%), with a typical treatment duration of 1-3 months (65%). Tablets were the preferred formulation (93.47%), and 62% highlighted the combination's role in improving cognitive decline, membrane fluidity, and aphasia recovery.

Conclusion: The study emphasizes the prominence of hypertension as a major risk factor and the widespread use of piracetam and citicoline as neuroprotective agents. The combination therapy is notably linked to improved cognitive function, aphasia recovery, and neuronal membrane restoration. The preference for oral tablet formulations and a treatment duration of 1-3 months reflects current clinical practices in Indian settings.

Introduction

Globally, over 12.2 million individuals experience their first stroke every year, equating to one stroke every three seconds.[1] According to the 2025 Global Stroke Fact Sheet, the global burden of stroke has risen significantly, with a 70% increase in incident strokes, a 44% rise in stroke-related deaths, and a 32% increase in disability-adjusted life years (DALYs). This burden is particularly pronounced in lower-income and lower-middle-income countries, which account for 87% of stroke-related deaths and 89% of DALYs.[2] In India, the stroke burden is rising steadily, making it the fourth leading cause of death and the fifth leading cause of disability. The annual incidence of stroke in India ranges between 105 and 152 per 100,000 individuals. [3] Vertigo is a common and often debilitating neurological symptom, affecting approximately one in five individuals at least occasionally. [4] Its global prevalence is estimated to range between 3% and 10%. [4] In India, vertigo is reported in 0.71% of the rural population.[5]

Piracetam is beneficial in managing both vertigo and stroke-related complications due to its multifaceted mechanism of action. In stroke, piracetam enhances neurotransmission in the glutamatergic and cholinergic systems, contributing to improved cognitive and motor recovery. It also restores membrane fluidity and enhances microcirculation by reducing vasospasm and promoting cerebral blood flow, thereby supporting vascular health in ischemic conditions.[6] In vertigo, piracetam helps reduce the frequency, severity, and duration of episodes, along with improving associated malaise and imbalance.

Citicoline, on the other hand, aids in neuronal recovery by providing choline and cytidine, essential for phosphatidylcholine synthesis and acetylcholine production. This facilitates neuronal membrane repair and regeneration. Furthermore, citicoline reduces free fatty acid-induced toxicity during ischemic insults, offering neuroprotection in acute stroke and aiding functional recovery.[7]

The synergistic action of piracetam and citicoline addresses both vascular and neuronal mechanisms for the effective management of stroke. This study aims to gather expert opinions on the clinical use of piracetam and citicoline in stroke recovery, as well as piracetam monotherapy in treating vertigo.

Methodology

We carried out a cross-sectional study among neuropsychiatry experts from routine healthcare settings across India from June 2024 to December 2024. The study was conducted after receiving approval from Bangalore Ethics, an Independent Ethics Committee, which was recognized by the Indian Regulatory Authority, the Drug Controller General of India.

A convenient sampling technique was used, and an invitation was sent to leading clinicians in managing neurological conditions in the month of March 2024 for participation in this Indian survey. About 490 clinicians from major cities of all Indian states, representing the geographical distribution, shared their willingness to participate and provide necessary data. The questionnaire booklet titled TRYGO (CiTicolineandPiRaceteam molecule in Management of stroke) was sent to clinicians who were interested in participating in this study.

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The TRYGO study questionnaire included 24 questions related to clinical practices, preferences, and experiences with citicoline and piracetam for stroke, as well as piracetam monotherapy for vertigo. Survey questions were developed using the methods designed to collect perspectives from the practitioners. Reliability as determined by a split-half test (coefficient alpha) was adequate but should be improved in future versions of the questionnaire. A study of criterion validity was undertaken to test the questionnaire and to develop methods of testing the validity of measures of Physicians' Perspectives. However, the extraneous variable in this includes the clinician's experience, usage of the newer drugs, etc. The two criteria used were the doctors' perspectives from the clinical practice and the assessment of an external assessor and statistician. Participants were allowed to skip questions and were instructed to complete the survey independently without consulting colleagues. Informed consent was obtained from all participants before the study commenced.

Statistical analysis

The data were analyzed using descriptive statistics, with categorical variables expressed as percentages to illustrate their distribution. Frequency and percentage calculations were conducted, and pie and bar charts were created using Microsoft Excel 2013 (version 16.0.13901.20400).

Results

The study gathered responses from 490 participants. Nearly 42% reported that the 36–45-year age group is the most common demographic for young adult stroke patients (18 to 50 years) in clinical practice in India. More than half of the participants (53.27%) indicated that they encounter young adult stroke patients in clinical practice 11–20% of the time. Approximately 58% of the experts identified hypertension as the most common risk factor for stroke among young Indian patients (Figure 1).

About 44% of participants highlighted limited access to physical rehabilitation as a significant challenge faced by young adult stroke patients during recovery in India. Over half of the participants (58.57%) emphasized the importance of regular counseling sessions for assessing the psychological and emotional needs of young adult stroke patients during their recovery.

Approximately 62% of participants identified rehabilitation centers as the most commonly available and effective resources for supporting the recovery of young adult stroke patients in India. Around 40% of clinicians suggested that training healthcare professionals on early stroke recognition measures could improve stroke awareness and encourage early intervention for young Indians. Half of the respondents (50.82%) reported that young adult stroke patients experience reduced quality of life due to long-term implications and challenges in daily life (Table 1). About 34% of clinicians cited patient compliance with regular medication as one of the most challenging aspects of managing young adult stroke patients in clinical practice. According to 40% of participants, 26-50% of young adult stroke patients are prescribed neuroprotective agents.

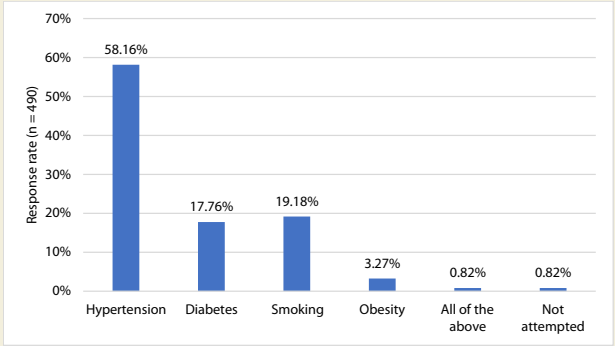

Figure 1: Distribution of responses to common risk factors for stroke among young Indian patients

Over half of the respondents (56.12%) acknowledged that neuroprotective agents help improve functional outcomes and quality of life for young adult stroke patients. A significant 76% of the clinicians considered the combination of piracetam and citicoline as promising neuroprotective agents for young adult stroke patients in India (Figure 2).

Approximately 48% of participants highlighted that citicoline benefits young adult stroke patients by restoring the activity of mitochondrial ATPase and membrane Na+/K+ ATPase (Table 2). The majority (61.22%) of experts reported that 26–50% of young adult stroke patients are prescribed a combination of piracetam and citicoline. Most respondents (87.55%) stated that the most commonly

Table 1: Distribution of responses to long-term implications and challenges faced by young adult stroke patients in daily life

Implications and challenges	Response rate (n = 490)
Risk of recurrent episodes	17.14%
Social isolation	7.55%
Reduced quality of life	50.82%
Complications due to non-compliance with treatment	24.08%
All of the above	0.2%
Not attempted	0.2%

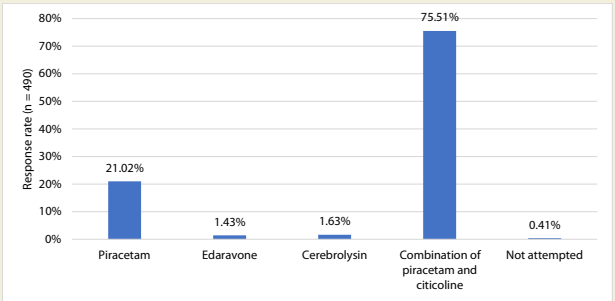

Figure 2: Distribution of response to promising neuroprotective agents for young adult stroke patients in Indian settings

Table 2: Distribution of responses to the benefits of citicoline in stroke patients

Benefits	Response rate (n = 490)
Restoring the activity of mitochondrial ATPase and membrane Na+ /K+ ATPase	48.37%
Inhibits the activation of phospholipase A2	22.04%
Accelerates the reabsorption of cerebral edema	28.98%
All of the above	0.2%
Not attempted	0.41%

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prescribed dosages of piracetam and citicoline for acute stroke in young patients are 800 mg and 500 mg, respectively (Figure 3).

About 26% of participants reported that the key advantage of fixed-dose combinations of piracetam and citicoline is their synergistic effects. According to 65% of respondents, the typical duration of piracetam and citicoline combination treatment for young adult stroke patients is 1–3 months (Figure 4). Nearly all participants (93.47%) indicated that tablets are the preferred formulation of piracetam and citicoline for young adult stroke patients in clinical practice (Table 3). Around 62% of experts noted that the combination of piracetam and citicoline helps restore neuronal membrane fluidity, improve cognitive function, and alleviate aphasia in post-stroke recovery (Table 4).

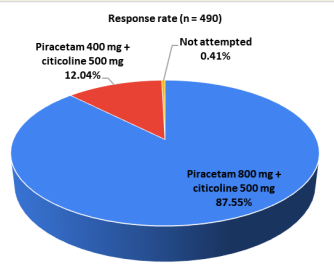

Figure 3: Distribution of responses to the most commonly prescribed strengths of piracetam and citicoline for acute stroke in young patients

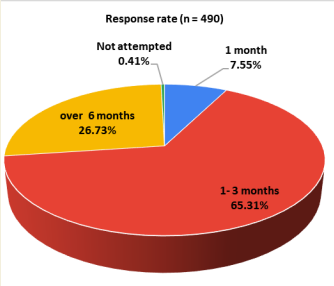

Figure 4: Distribution of responses to the duration of piracetam and citicoline combination treatment for young adult stroke patients in clinical practice

Table 3: Distribution of responses to the most preferred formulation of piracetam and citicoline combination for young adult stroke patients in clinical practice

Most preferred	Response rate (n = 490)
Tablets	93.47%
Syrup	4.29%
Injection	1.22%
All of the above	0.61%
Not attempted	0.41%

Table 4: Distribution of responses to the opinion regarding the combination of piracetam and citicoline in post-stroke recovery

Opinion	Response rate (n = 490)
Restores neuronal membrane fluidity	10.82%
Improves cognitive decline	16.53%
Improves aphasia due to stroke	10.2%
All of the above	62.04%
Not attempted	0.41%

Nearly half of the participants (47.96%) considered adjuvant therapy a factor influencing their preference for piracetam in treating vertigo patients. Approximately 43% identified mixed-origin vertigo as the most common indication for piracetam prescription. About 49% of experts reported that piracetam treatment reduces the frequency of vertigo episodes.

Over half of the experts (53.27%) recommended a piracetam dosage range of 800–1600 mg/day for vertigo treatment. Nearly 42% indicated that the typical duration of piracetam treatment for vertigo is 1-4 weeks.

Discussion

The study results underscore the importance of early intervention and combination therapies in managing neuropsychiatric disorders. Hypertension emerged as the most common risk factor for stroke among young Indian patients, as reported by a majority of participants. Consistent with these findings, Parikshith et al. identified hypertension as the most prevalent risk factor for stroke, affecting 18 patients (36%) in their cohort.[8] Similar observations were made by Dalal et al., who reported an incidence of 46.7%, and Alvarez et al., who reported 23%, all recognizing hypertension as a significant contributor to stroke risk.[9,10] This underscores the need for aggressive blood pressure control as part of preventive strategies.

Respondents also highlighted the long-term impact of stroke on young patients' quality of life, emphasizing challenges in daily living and sustained health concerns.Schneider et al. found that young ischemic stroke survivors often experience persistent declines in health-related quality of life (HRQOL), except for those achieving excellent functional recovery.[11] Similarly, Rohner et al. reported that self-rated HRQOL, depression, and fatigue levels in adult paediatric stroke survivors are comparable to those of healthy adult peers.[12]

Most study participants identified the combination of piracetam and citicoline as a promising neuroprotective treatment for young adult stroke patients in India. This aligns with findings from previous studies, including a cross-sectional survey conducted by the current authors, which reported this combination as the most commonly prescribed neuroprotective agent.[13] A prospective study by Shibu et al. demonstrated that while both citicoline and citicoline-piracetam combination improved post-stroke recovery, combination therapy showed superior neuroprotection and quality of life outcomes, supporting its inclusion in stroke recovery protocols.[14] Additionally, clinical evidence suggests that citicoline aids in restoring neuronal membrane integrity and enhancing mitochondrial function, while piracetam facilitates neuroplasticity, collectively contributing to improved recovery outcomes in young adult stroke patients.[15,16]

Many study participants emphasized that citicoline benefits young adult stroke patients by restoring mitochondrial ATPase and membrane Na+/K+ ATPase activity. Supporting this, a pharmacological and clinical review by Secades reported citicoline's role in restoring these enzyme activities, inhibiting phospholipase A2 activation, and accelerating cerebral edema reabsorption in experimental models.[17] Similarly, Bermejo et al. reported that citicoline not only restores mitochondrial ATPase and membrane

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Na+/K+ ATPase activity but also reduces neuroinflammation caused by ischemia, limits reactive oxygen species production, and promotes cerebral edema resolution, underscoring its multifaceted neuroprotective effects.[18]

Most participants reported that the typical prescribed doses of piracetam and citicoline for acute stroke in young patients are 800 mg and 500 mg, respectively. Murugesan et al. found that a 500 mg oral dose of citicoline can be safely taken with minimal adverse effects and appears to improve both functional and neurological deficits. [19] Similarly, Doijad et al. highlighted the availability of a fixed-dose combination tablet containing 500 mg of citicoline and 800 mg of piracetam, providing a convenient treatment option. [20] A related cross-sectional study further indicated that 800 mg of piracetam is frequently prescribed to most stroke patients, reinforcing its common use in clinical practice.[13]

A significant proportion of current study participants reported that the typical duration for the combination treatment of piracetam and citicoline in young adult stroke patients is 1-3 months. Tablets were identified as the preferred form for administering these agents in clinical practice.A previous study by the current authors similarly observed that many physicians recommend this combination therapy for a 1-3-month duration.[13] Additionally, the authors also noted that 400 mg tablets are commonly prescribed, with 11% of clinicians opting for 1200 mg tablets specifically for managing vertigo, reflecting diverse dosing preferences based on clinical indications.[13]

A majority of respondents emphasized that the combination of piracetam and citicoline effectively restores neuronal membrane fluidity, improves cognitive decline, and alleviates aphasia during post-stroke recovery. A similar cross-sectional study reported significant improvement in aphasia following stroke, with 18% of respondents attributing this to restored neuronal membrane fluidity. Additionally, 93% of clinicians in the study agreed that piracetam enhances cognitive recovery after surgery.[13] Sharma et al. further highlighted that piracetam, a nootropic agent, enhances cerebral blood flow, improves oxygen extraction, restores membrane fluidity, and modulates neurotransmission, reinforcing its role in neuroprotection and cognitive enhancement.[21]

The study provides valuable insights into clinical practices related to young adult stroke patients in India, offering data on demographics, risk factors, treatment approaches, and recovery challenges. It highlights the use of piracetam and citicoline in acute stroke management, particularly their effectiveness in improving cognitive decline and post-stroke recovery. The large sample size (490 participants) strengthens the findings and helps identify trends in treatment practices, such as dosage preferences and rehabilitation strategies. However, the reliance on self-reported data may introduce bias or inaccuracies. Additionally, the survey's cross-sectional design limits conclusions about long-term outcomes or causality. The findings are specific to clinical practices in India and may not be generalizable to regions with different healthcare systems or stroke management protocols.

Conclusion

The study highlights hypertension as the most common risk factor in young adult stroke patients in Indian settings, with limited rehabilitation access and medication non-compliance as key challenges. The combination of piracetam and citicoline is widely regarded as having perceived efficacy for cognitive recovery, with oral tablets preferred for convenience. Improved healthcare training and enhanced rehabilitation access are crucial for better outcomes.

Disclosure of compliance with ethical principles

The study was conducted after receiving approval from Bangalore Ethics, an Independent Ethics Committee, which was recognized by the Indian Regulatory Authority, Drug Controller General of India.

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