Journal of Ayurveda & Holistic Medicine

https://jahm.co.in

eISSN-2321-1563

Case Report

Integrative multimodal Ayurveda-based Management of Alcohol-Related Wernicke–Korsakoff Syndrome (WKS): A Case Report

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ABSTRACT:

Background: Wernicke–Korsakoff syndrome (WKS), chronic neuropsychiatric disorder commonly associated with prolonged alcohol consumption and thiamine deficiency. It frequently leads to persistence of considerable cognitive, behavioral and functional impairment despite standard conventional treatment. In Ayurveda clinical manifestations of alcohol-associated WKS can be understood through the lens of *Unmada* and *Smritibhramsha*. **Methodology:** A single case report of 51-year-old male with 16-year history of chronic alcohol intake presented with gradually progressive memory impairment, gait instability, sleep disturbance, mood changes, confusion, craving for alcohol and occupational dysfunction started since last 9 months. Patient had a history suggestive of Wernicke encephalopathy managed with standard pharmacological treatment previously, followed by persisting cognitive disturbances. Baseline assessment revealed moderate cognitive impairment when assessed on Mini-Mental Status Examination (16/30), harmful alcohol use pattern when assessed through AUDIT scale (21/40) and depressive symptoms when assessed through Hamilton Depression Rating scale (15/52). **Intervention:** Patient was managed with 6 months structured multimodal integrative Ayurvedic based treatment protocol consisting of *Nasya* with *Brahmi Ghrita, Sarvanga Abhyanga* with *Bala-Ashwagandhadi taila* and *bhashpa sweda, Shirodhara* and *Shirotalam* with *Brahmi taila*, *Shamana* medicines which includes *Draksharishtam*, *Brahmi Vati, Saraswata Ghrita, Medhya Rasayana* and Syrup Cognium along with *Satwawajaya Chikitsa*, *Marma* therapy and *Yoga*. Treatments were administered over a phased inpatient, outpatient and home based follow-up manner. **Outcomes**: Gradual, progressive and sustained neurocognitive as well as functional improvement was observed over follow-up period in terms of psychometric scales like Mini-Mental Status Examination, AUDIT, Hamilton Depression Rating Scale. No adverse drug events were reported while compliance with prescribed treatment was good. **Conclusion**: Over 6 months, multimodal integrative Ayurveda based intervention with systematic follow-up was administered. Which shown progressive and sustained improvement across cognitive function and other symptoms. Case highlight's potential adjunctive role of Ayurveda-based neuro-rehabilitative intervention in chronic phase of alcohol-related Wernicke–Korsakoff syndrome.ple chalazia, *Utsangini*.

KEYWORDS: Case Report, *Smritibhramsha*, *Unmada*, Wernicke-Korsakoff syndrome.

RECEIVED ON:
15-01-2026

REVISED ON:
06-02-2026

ACCEPTED ON:
14-02-2026

Access This Article Online:

Quick Response Code:

Website Link:

https://jahm.co.in

DOI Link:

https://doi.org/10.70066/jahm.v14i2.2547

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CITE THIS ARTICLE AS

Rajimunnisa Begam Shaik, Sunil Kumar, Bawadkar Prasad, Bhushan Mhaiskar. Integrative multimodal Ayurveda-based Management of Alcohol-Related Wernicke–Korsakoff Syndrome (WKS): A Case Report. Journal of Ayurveda and Holistic Medicine (JAHM) 2026; 14(2):55-63.

1. INTRODUCTION

Wernicke-Korsakoff syndrome (WKS), a rare neurological disorder caused by deficiency of thiamine (vitamin-B1), most frequently due to chronic alcohol intake. It is classically characterized by a triad of features including altered mental status, ocular abnormalities like nystagmus or ophthalmoplegia and gait ataxia; though, fewer than a third of patients exhibit all 3 features. [1] WKS is combined presence of Wernicke encephalopathy and Korsakoff syndrome. [1-3] Reported prevalence of WKS is around 0-2% globally. [4] Treatment modalities includes provision of thiamine and other vitamins, proper nutrition, abstinence from alcohol and general supportive care. [5] There is no highly effective treatment for and full recovery is rare. Symptoms of encephalopathy are usually reversible with thiamine replacement within 5-12 days. Very few patients achieve full recovery and require long term rehabilitation. [6] There is no benefit to prophylactic thiamine treatment neither on mortality nor to prevent Wernicke syndrome. [7] At the time of discharge, almost 50% of patients exhibit residual cognitive and psychosocial deficits and many have poor prognosis despite standard treatment with parenteral thiamine. [6] Ayurvedic classics have depicted similar severe mental and it's cognitive disturbances under broad concept of *Unmada* and *Smritibhramsha* (memory impairment). Ayurveda considered *Unmada* as disorder abounding with distortion pertaining to thought, awareness, memory, behavior and social functioning. [8] *Unmada* as clinical condition involving imbalance of bodily humors (*Vata, Pitta* and *Kapha*) together with perversion of mind (*Sattva, Rajas* and *Tamas*) which ends in affliction of higher mental faculties. [8] *Manasika Gunas* involves predominance of *Rajas* and *Tamas*, meaning *Manasika Guna dushti* as well. Involvement of *Rasa* and *majja dhatu* along with *ojodushti* (deranged vital essence) as reflected in the form of *Hina Bala* (lack of physical strength) and *Avara Sattva (lack of mental strength) in this cases*. Physical as well as psychological stressors are believed to further exacerbate this imbalance, resulting in cognitive, emotional and psychomotor abnormalities developing in acute stages or gradually over time. *Acharya Charaka* describes a complete treatment protocol for *Unmada* compromising *Daivavyapashraya* (spiritual practices), *Yukti Vyapashraya* (rational therapeutic measures) and *Satwawajaya* (psychotherapeutic approaches) comprising medication and non-medication processes for management of *Unmada*. [9]

This case is unique in multiple doamins. Most important is, it represents a rare, well documented presentation of chronic WKS managed through integrative Ayurvedic approach. Secondly clinical course was prospectively recorded using standardized assessment tools ensuring objective documentation of outcomes. Third one is that patient was followed over a long term period, as it allows evaluation of sustained therapeutic effects. Fourth is clearly structured, phased treatment protocol was implemented, combining inpatient and home-based interventions. Additionally, there was no recurrence of psychotic as well as cognitive symptoms during follow-up period. Lastly considering that recovery rates with conventional thiamine based therapy remain modest, observed clinical improvement highlights potential adjunctive value of integrative Ayurvedic management in refractory cases like WKS.

2. CASE PRESENTATION

Patient Information: A 51 year old male laborer presented with progressive complaints of forgetfulness, poor memory of recent events, confusion, poor work efficiency, poor sleep, irritability and unsteady gait since last nine months. These symptoms were severe enough to cause significant impairment in his occupational as well as social life. He has a 16-year history of chronic alcohol consumption (180-240 ml/day) and irregular eating habits. He was a known case of type 2 diabetes mellitus and hypertension since past five

years on irregular treatment with telmisartan 40 mg once a day metformin 500 mg and glimepiride 2 mg. He had received parenteral thiamine in the past but he was not on any supplementation at the time of presentation. There was no significant family history of psychiatric or neurological disorders.

Clinical Findings: 9 months back, patient suffered an acute episode of confusion, disorientation and imbalance requiring hospitalization, where he received parenteral thiamine (current Serum thiamine levels>472 nmol/L). Though his acute symptoms remitted, his memory and cognitive symptoms persisted. He was unable to return to work and continued to consume alcohol intermittently. On general examination, he was conscious and cooperative, oriented to person and inconsistently to time and place with mild truncal ataxia. There were no any abnormalities reported on neurological examination. Mental status examination revealed anterograde amnesia, poor attention, impaired abstraction, partial insight and depressive mood with affective restriction. No delusions or hallucinations were present. Examination of other systems did not reveal any gross abnormality. Ayurvedic examination assessment revealed a *Vata-Kapha* predominant *prakriti* (constitution). He had a *Vata-pradhana tridoshaja* vitiation. *Ashtavidha Pariksha* (eight-fold examination) revealed a *Vata-Kapha* dominant *nadi* (pulse), *nirama jivha* (uncoated tongue) hard and unsatisfactory bowel evacuation and had reduced capacity to digest food as well as perform work. *Samprapti ghataka* involvement includes chronic *Madya sevana* as *nidana* (cause) factor with *Vata pradhana tridoshaj dosha dushti* with dominance of *rajas* and *tamas manasika gunas* (disturbed mental qualities). Involvement of *Rasa* along *Majja dhatu* (nutritive and marrow tissues) with *Ojodushti* was reported along with *Mandagni* (weak digestion). *Manovaha* and *Majjavaha srotas* were affected through *Sanga* and *Vimargagamana* (obstruction and abnormal movement) with condition involving at *Hridaya* and *Mastishka* (heart and brain). *Dashavidha pariksha* indicated *Vata–kapha prakriti* and *vata pradhana tridoshaj vikriti* (pathological state), *Avara sattva* as well as *samhanana* (reduced mental strength and body build), *Madhyama pramana* and *vaya* (average body build and middle age) with reduced *ahara* as well as *vyayama shakti* (digestive and physical capacity). A detailed timeline of clinical events outlined in Table 1.

Table 1: Timeline of Clinical Events

Time point	Clinical events, assessments, and interventions
16 years prior	Initiation of regular alcohol consumption, gradually increasing quantity, irregular dietary intake
9 months prior	Acute episode of confusion, disorientation and gait imbalance, hospitalized locally, diagnosed clinically as Wernicke's encephalopathy; treated with parenteral thiamine(serum thiamine levels are < 472 nmol)
Following weeks	Acute confusional state improved, persistent memory impairment, reduced attention and functional decline noted (Gait)
3–6 months prior	Difficulty performing occupational tasks, disturbed sleep, low mood, continued intermittent alcohol intake
Baseline (Day 0)	Presentation to OPD: MMSE 16/30, AUDIT 21, HDRS 15, diagnosis of alcohol-related WKS established
Day 7	Completion of initial Panchakarma procedures, mild improvement in sleep and attention.
Day 30	MMSE 18/30, AUDIT 14, HDRS 10, improved mood and reduced alcohol intake
Day 90	MMSE 22/30, improved executive function and daily activity performance
Day 180	MMSE 23/30, AUDIT 7, HDRS 7, functional independence in daily activities

Diagnostic Assessment: Baseline neurocognitive examination revealed Mini-Mental State Examination score of 16/30 indicative of moderate cognitive impairment, significant severity of alcohol use (AUDIT score: 21) and moderate depressive symptoms (HAM-D score: 15). A repeat laboratory evaluation was not carried out as recent reports showed borderline serum thiamine level following parenteral supplementation and mild elevation of aspartate aminotransferase suggestive of metabolic involvement secondary to alcohol use. Advanced neuroimaging was not carried out due to financial constraints. There were no focal neurological deficits on examination.

Diagnostic Challenges: Diagnostic was difficult due to lack of the full classical triad on presentation, partial modification of symptoms and marginal thiamine levels with prior supplementation.

Differential Diagnosis: Differentials considered and reasons for their exclusion are mentioned in Table 2.

Table 2: Differential diagnosis in there reason for consideration and exclusion

Condition	Reason for Consideration	Reason for Exclusion
Alcohol-related dementia	Chronic alcohol use with progressive cognitive decline	Acute onset following Wernicke's episode and partial reversibility favored WKS
Hepatic encephalopathy	History of alcohol-related liver dysfunction	Preserved consciousness, absence of asterixis, stable biochemical parameters
Early onset Alzheimer's disease	Memory impairment and executive dysfunction	Temporal association with alcohol misuse and nutritional deficiency
Depressive pseudodementia	Depressive symptoms with cognitive complaints	Objective cognitive deficits on MMSE
Vitamin B12 deficiency	Cognitive and gait disturbances	Normal serum vitamin B12 levels
Alcohol-related Wernicke–Korsakoff syndrome (Final diagnosis)	Long-standing alcohol use, prior episode suggestive of Wernicke's encephalopathy, persistent anterograde amnesia, gait instability, mood and behavioral disturbances	Diagnosis confirmed by fulfilment of Caine's criteria, characteristic clinical course, exclusion of alternative causes, supportive laboratory findings, and longitudinal response to integrative management

On basis of chronic alcohol consumption, presentation and fulfiling of 3 of 4 Caines criteria, [10, 11] final diagnosis of alcohol-related WKS was made. From Ayurvedic understanding, presentation was interpreted as that of *Unmada* predominance of *Smritibhramsha*.

Prognosis: WKS has a guarded prognosis, with reports indicating that only 20–25% of patients achieve nearly complete recovery while 40–50% of patients partially improve, particularly if diagnosed and treated delays.. In current case, short term prognosis was favorable, with progressive and marked cognitive as well as functional improvement seen on follow up over 6 months..

Therapeutic Intervention: A structured comprehensive multimodal phased integrative Ayurvedic treatment was planned. Patient was not receiving any concurrent medication during whole intervention period except hypertensive and glycemic control medication. Details of the therapeutic interventions are outlined in Figure 1 and Table 3.

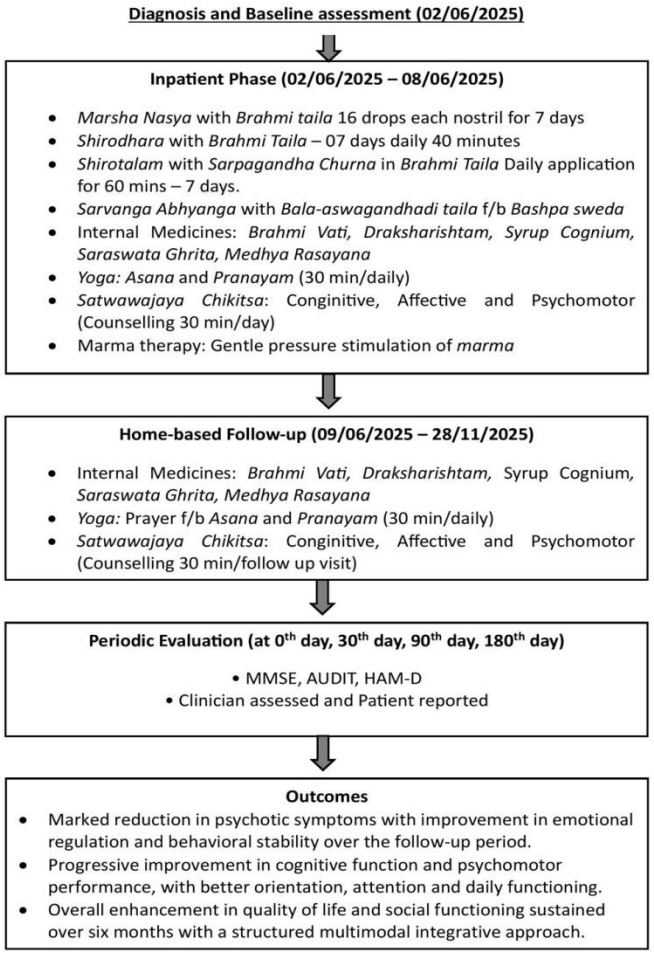

Figure 1. Phase wise summary of Therapeutic Interventions

Follow-Up and Outcomes: Follow-up assessments were carried out at regular intervals using clinician assessed objective scales and patient assessed subjective outcomes over period of 6 months. (Table 4)

Adherence, Tolerability and Adverse Events: Adherence were monitored and carried out using direct supervision during inpatient phase while at home based phase via regular teleconsultations, medicine count, patient maintained logs as well as caregiver reports. Patient followed all prescribed therapies and medications as instructed with good tolerability with no adverse effects.

3. DISCUSSION

Previous studies have reported positive outcomes of Ayurvedic intervention in many neuropsychiatric and cognitive disorders. *Medhya Rasayana* (nootropic rejuvenative) formulations like *Brahmi*, *Saraswata Ghrita* and *yoga* may have favorable effect on memory, attention, and behavioral symptoms in small clinical trials and in case series with cognitive impairment. [12] Nasya therapy has shown favorable outcome in psychological disorders like Unmada and anxiety, also it has influence on higher mental functions. Even *Shirodhara* (pouring if medicated liquid on forehead), *Satwawajaya Chikitsa* had describing stress relieving and mood stabilizing effects. [9]

Table 3: Details of Therapeutic Interventions (In-Patient and Home-based)

Therapy Type	Intervention	Drugs/Materials	Dose / Duration	IP-based (02/06/25–08/06/25)	Home-based		
					09/06/25–01/07/25	01/07/25–30/08/25	30/08/25–28/11/25
Nasya (therapeutic nasal instillation) and External Therapies	*Nasya Karma (Marsha)*	*Brahmi Ghrita* (Batch No.YJ1e)	16 drops/nostril, 7 days	✓	–	–	–
	Shirodhara	*Brahmi Taila* (Batch No.241)	1.5 L total, 7 days	✓	–	–	–
	Sarvanga Abhyanga f/b *Bashpa Sweda*	*Bala–Ashwagandhadi Taila* (Batch No.55/24)	Daily, 7 days	✓	–	–	–
	Shirotalam	*Brahmi Taila with Sarpagandha Churna* (Batch No.241)	60 minutes daily, 7 days	✓	–	–	–

Shamana Medicines	Syrup Cognium (Batch No.S00041)		1 tsp BID with warm water	✓	✓	✓	-
	Draksharishtam (ADF-066)		3 tsp BID with warm water	✓	✓	✓	-
	Brahmi Vati (Batch No.YPY-2301)		2 tablets BID	✓	✓	✓	-
	Saraswata Ghrita (Batch No.I-K-22-23)		3 tsp BID with warm water	–	✓	✓	✓
	Medhya Rasayana (Batch No.MR2317)		2 tsp BID with warm water	–	✓	✓	✓
Satwawajaya Chikitsa (Psychotherapy)	Cognitive orientation, reassurance, memory engagement tasks, behavioral counseling for alcohol cessation		30 min/session for first 7 days and at follow up	✓	✓	✓	✓
Marma Therapy (Vital point stimulation)	Vital point stimulation applied at *Indrabasti, Manibandha, Talahridaya Marma* using gentle thumb pressure		16 presses/*marma*/day (5 min)- 7 days	✓	–	–	–
Yoga	*Asana* practice	Prayer f/b *Pawanmuktasana, Tadasana, Shavasana*	Daily 20 min daily, 90 days	✓	✓	✓	✓
	Pranayama	*Dhyana, Ujjayi, Bhramari, Nadi Shodhana*	Daily 20 min daily, 90 days	✓	✓	✓	✓

Table 4: Follow-up-wise Outcome Assessment

Follow-up point	Time since baseline	Clinician-assessed outcomes	Patient-assessed outcomes
Baseline	02/06/25	MMSE: 16/30 (moderate cognitive impairment); AUDIT: 21 (harmful alcohol use); HDRS: 15 (moderate depression); mild truncal ataxia	Severe forgetfulness, poor sleep, low mood, reduced work capacity, strong alcohol craving
Follow-up 1	01/07/25	MMSE: 18/30; AUDIT: 14; HDRS: 10; improved attention and sleep	Subjective improvement in sleep, slight reduction in forgetfulness, reduced alcohol intake, improved motivation
Follow-up 2	30/08/25	MMSE: 22/30; further improvement in executive function; gait stability improved	Better daily activity performance, improved memory recall, reduced irritability, improved confidence
Follow-up 3	28/11/25	MMSE: 23/30; AUDIT: 7; HDRS: 7; functional independence achieved	Marked improvement in memory, mood stability, minimal alcohol craving, independent daily functioning (no alcohol consumption in last 1 month)

This reported case is in accordance with above-mentioned observations and exploration their significance in chronic WKS. Chronic alcoholism hampers *vata* affecting *prana, udana* along with *vyana* vata. *Prana vata* responsible for mental clarity and its impairment leads to confusion as well as memory loss. *Udana vayu* responsible for speech and higher mental functions causing poor memory as well as lack of initiative when disturbed. *Vyana vayu* regulates circulation as well as coordination and its disturbance results in sluggish circulation and fatigue. All together contribute to memory loss, disorientation along with behavioral problems seen in *Smritibhramsha* and *Unmada* similar to WKS.

Nasya is regarded as treatment of choice for *Urdhvajatrugata Vikara* (disorders involving head and higher mental functions) [13] and is also indicated in psychological conditions like *Unmada*. [14] Hence to act on the central site of pathology, *Nasya* was chosen for this chronic presentation of prominent cognitive, behavioral and emotional disturbances in this case. *Brahmi (Bacopa monnieri* (L.) Pennell*) Ghrita* was selected for its *Medhya* (nootropic) property. Classical text mentions that nasal administration of medicated *Ghrita* influences cerebral structures and pacifying aggravated *Vata*, thereby stabilizing mental functions. [15] *Shirodhara* along with *Shirotalam* (application of medicated paste on scalp) were used for pacifying *Prana Vata, Sadhaka Pitta* and *Tarpaka Kapha*, consequences of which were observed with reduced agitation and improved stress response. [9, 16] *Sarpagandha* (*R. serpentina*) with *Brahmi Taila* was used for its known antipsychotic action. Follow-up medications, *Medhya Rasayana* [12,17] and *Saraswata Ghrita* were provided for cognitive recovery, whereas *Draksharishta* may have helped in lessening the alcohol craving. *Satvavajaya Chikitsa*, [18] *Yoga* and *Pranayama* [12] contributed to cognitive, emotional and behavioral control including alcohol cessation through autonomic stabilization as well as regular counselling in addition *Marma* therapy [19] triggered mental and emotional stability as per previous case reports. Overall, structured multimodal approach was associated with gradual improvement in psychomotor function and improved quality of life during a period of six months, which highlighted its potential value in chronic relapsing neuropsychiatric conditions. (Figure 2)

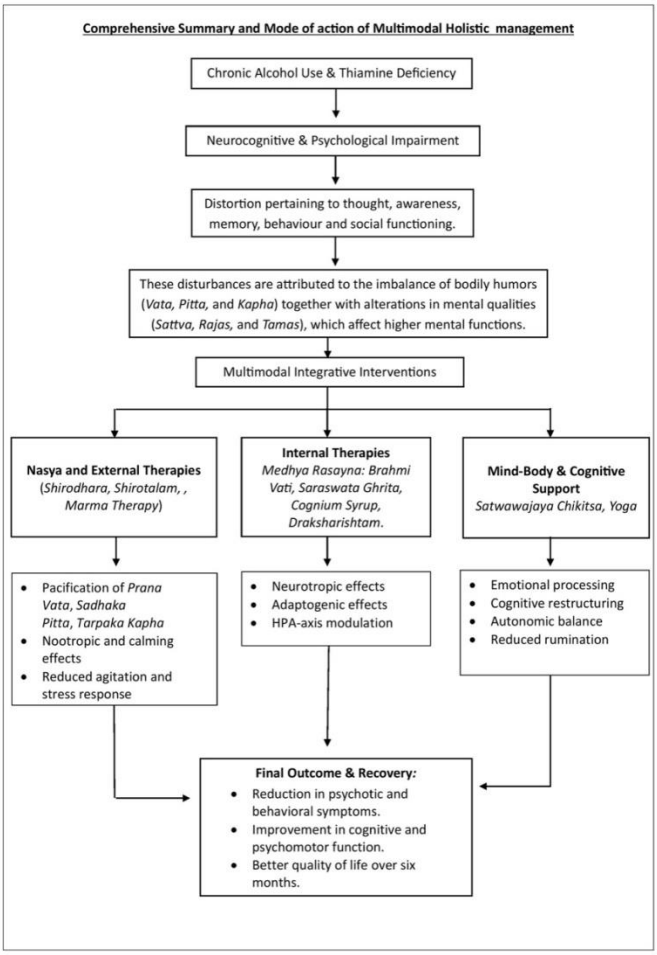

Figure 2: Summary of Mode of Action of Multimodal integrative Ayurveda treatment

Strengths: This case has proved successful application of a systematic, long term; multimodal Ayurveda based intervention in a situation with less odds of expected recovery (20%). Combined in-patient and home-based therapies helped to ensure the continuity of care and compliance while the simultaneous use of objective (Clinician) and subjective (patient-reported) assessments provided comprehensive evaluation of treatment outcomes.

Limitations: Limitations of the study is its single case design and so generalisability of findings is limited. No control or comparator group, haematological investigation was used, so it is not possible to conclude whether the intervention was better than usual care or another type of treatment.

Future research should include larger size, controlled clinical trials to verify the effectiveness and safety of the intervention. Standardized objective and subjective, hematological assessment tools should be essential to ensure reproducibility and facilitate inter study comparative analysis.

4. CONCLUSION

A structured, multimodal integrative Ayurvedic intervention which included external therapies (*nasya, shirodhara, shirotalam)*, internal *medhya* drugs, *satwawajaya chikitsa, marma* therapy and *yoga pranayama* was administered over a period of 180 days, with total of 4 systematic follow-up demonstrated sustained improvement in cognitive function, mood, alcohol craving, gait stability, sleep quality as well as overall functional independence assessed through standardised scales (AUDIT reduced from 21 to 7, MMSE was improved from 16 to 23) in a patient with chronic alcohol-related Wernicke–Korsakoff syndrome suffered since last 9 months. Phased inpatient, outpatient and home-based approach ensured continuity of care and good treatment adherence with no adverse events were reported throughout whole treatment and follow-up course. This case highlights the potential role of Ayurveda-based neurorehabilitative strategies as adjunct to standard conventional management in addressing long-term sequelae of WKS. Although findings from a single case cannot be generalized, they highlight need for further well-designed clinical trials to evaluate efficacy, safety and reproducibility of integrative therapies.

List of Abbreviations used:

AUDIT – Alcohol Use Disorders Identification Test

HAM-D/HDRS – Hamilton Depression Rating Scale

MMSE – Mini-Mental State Examination

WKS – Wernicke–Korsakoff Syndrome

WE – Wernicke Encephalopathy

KS – Korsakoff Syndrome

CNS – Central Nervous System

IP – Inpatient

OP – Outpatient

Declaration of Patient Consent – The authors confirm that they have acquired a patient consent form, in which the patient or caregiver has granted permission for the publication of the case, including accompanying images and other clinical details, in the journal. The patient or caregiver acknowledges that their name and initials will not be disclosed, and sincere attempts will be undertaken to safeguard their identity. However, complete anonymity cannot be assured.

Patient perspective - Patient reported improved memory, sleep, confidence and importanatly alcohol cravings. At the end carving ceased completely which was major boost what patient told.

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Data Collection and literature search: BP, RBS

Writing -Original Draft: BP, RSD

Reviewing & editing: RBS, BP, RSD

Approval of final manuscript: All authors

Declaration of Generative AI

The authors declare this manuscript was written without the use of generative artificial intelligence tools. All the content, including text generation, data analysis and references was developed and reviewed by the author without assistance from AI technologies.

Conflict of Interest – The authors declare no conflicts of interest.

Source of Support – The authors declare no source of support.

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REFERENCES:

1. Akhouri S, Kuhn J, Newton EJ. *Wernicke–Korsakoff syndrome* [monograph on the Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan– [cited 2025 Jan]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK430729/
2. Vasan S, Kumar A. *Wernicke encephalopathy* [monograph on the Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan– [cited 2025 Jan]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470344/
3. Covell T, Siddiqui W. *Korsakoff syndrome* [monograph on the Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan– [updated 2024 Mar 12; cited 2025 Jan]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK539854/
4. Cook CCH, Hallwood PM, Thomson AD. B vitamin deficiency and neuropsychiatric syndromes in alcohol misuse. *Alcohol and Alcoholism.* 1998;33(4):317–336. Available from: https://doi.org/10.1093/oxfordjournals.alcalc.a008400
5. Thomson AD, Guerrini I, Marshall EJ. Wernicke's encephalopathy: Role of thiamine. *Nutrition Issues in Gastroenterology* [Internet]. Series No. 75. Practical Gastroenterology; 2009 Jun. Available from: https://med.virginia.edu/ginutrition/wp-content/uploads/sites/199/2014/06/ThomsonArticle-09.pdf
6. Huang CL. Residual cognitive deficit in adults with depression who recovered after 6-month treatment: Stable versus state-dependent markers. *Journal of Clinical Medical Research.* 2009 Oct;1(4):202–206. Available from: https://doi.org/10.4021/jocmr2009.10.1266
7. Royal College of Psychiatrists. *Alcohol and brain damage in adults: With reference to high-risk groups* (College Report CR185) [Internet]. London: The Royal College of Psychiatrists; 2014. Available from: https://www.rcpsych.ac.uk/docs/default-source/improving-care/better-mh-policy/college-reports/college-report-cr185.pdf?sfvrsn=66534d91_2
8. Yadavaji Trikamaji (editor). *Charaka Samhita* of Charaka, Chikitsasthana, chapter 9, verse no.1–14. Reprint edition, Varanasi; Chaukhambha Orientalia;2015;467-468.
9. Kulamarva K, Shivakumar V, Chikkanna U, Ramakrishna KK, Bhargav H, Varambally S. Role of Ayurveda in the management of psychotic disorders: A systematic review of clinical evidence. *Journal of Ayurveda and Integrative Medicine.* 2023 May–Jun;14(3):100720. Available from: https://doi.org/10.1016/j.jaim.2023.100720
10. Lin S, Leppla IE, Yan H, Probert JM, Randhawa PA, Leoutsakos JMS, Probasco JC, Neufeld KJ. Prevalence and Improvement of Caine-Positive Wernicke-Korsakoff Syndrome in Psychiatric Inpatient Admissions. *Psychosomatics*. 2020;61(1):31–38. Available from: https://doi.org/10.1016/j.psym.2019.08.002
11. Caine D, Halliday GM, Kril JJ, Harper CG. Operational criteria for the classification of chronic alcoholics: identification of Wernicke's encephalopathy. *J Neurol Neurosurg Psychiatry*. 1997;62(1):51–60. Available from: https://doi.org/10.1136/jnnp.62.1.51
12. Chobe S, Patra SK, Chobe M, Metri K. Efficacy of integrated yoga and Ayurveda Rasayana on cognitive functions in elderly with mild cognitive impairment: A non-randomized three-arm clinical trial. *Journal of Ayurveda and Integrative Medicine.* 2022 Jan–Mar;13(1):100373. Available from: https://doi.org/10.1016/j.jaim.2020.11.003
13. Yadavaji Trikamaji (editor). Susruta Samhita of Susruta, Chikitsasthana, chapter 40, verse no.23,54. Reprint edition. Varanasi; Chaukhambha Sanskrit Sansthan; 2024;555,557
14. Yadavaji Trikamaji (editor). Charaka Samhita of Charaka, Chikitsasthana, chapter 09, verse no.27. Reprint edition. Varanasi: Chaukhambha Surbharati Prakashana; 2008;470.
15. Bhimsagacharya Harisastri Paradakara Vaidya (editor). Astangahrdayam of Vagbhata, Uttarasthana, chapter 06, verse no.23–26. Reprint 10th edition. Varanasi: Chaukhambha Orientalia; 2017;799.
16. S Kumar MA, S R. Therapeutic efficacy of Shirodhara on mental health conditions and sleep disorders: A review. *Annals of Ayurvedic Medicine.* 2023;12(2):186–195. Available from: https://doi.org/10.5455/AAM.109973
17. Kulkarni R, Girish KJ, Kumar A. Nootropic herbs (Medhya Rasayana) in Ayurveda – an update. *Pharmacogn Rev.*2012;6(12):147–153. Available from: https://doi.org/10.4103/0973-7847.99949
18. Amin H, Sharma R. Nootropic efficacy of Satvavajaya Chikitsa and Ayurvedic drug therapy: A comparative clinical exposition. *International Journal of Yoga.* 2015 Jul–Dec;8(2):109–116. Available from: https://doi.org/10.4103/0973-6131.158473
19. Nibley S. *How to harness Marma therapy for holistic healing* [Internet]. National Ayurvedic Medical Association; 2024 Dec 20 [cited 2025 Nov 27]. Available from: https://www.ayurvedanama.org/insights/2024/12/20/how-to-harness-marma-therapy-for-holistic-healing