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Current status and future directions for the diagnosis and management of mild cognitive impairment in Southeast Asia: A SEACURE consensus paper

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ABSTRACT

Global aging populations are facing increased prevalence of mild cognitive impairment (MCI) – the preclinical stage of dementia characterized by single/multi-domain neurocognitive decline that does not impair an individual's normal daily functioning. Asian populations are at increased risk of developing MCI and dementia, and many cases go undetected in Southeast Asia (SEA), resulting in increased burden on patients, caregivers and national healthcare systems. There is an urgent need for efficient and scalable diagnostic and management strategies across SEA. Our findings illustrate that current strategies are limited by insufficient resources and a lack of awareness, particularly in developing SEA nations. Strategies for improving the MCI landscape in SEA include increasing widespread community awareness and cognitive health screenings for individuals with a history of vascular risk factors, validation of traditional cognitive screening tests in the respective countries, greater access to blood-biomarker testing, and the development and validation of novel digitized diagnostics.

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1. Introduction

Global aging populations are seeing greater prevalence of mild cognitive impairment (MCI) and dementia [1]. MCI is defined as the preclinical stage of dementia [2], presenting with neurocognitive decline across one or more cognitive domains that is not sufficient enough to impair daily functioning [3]. Notably, individuals with MCI have an annual progression rate of 12 % of developing dementia [4], compared to healthy older adults who are at a lower risk of 1 – 2 % [5]. The global dementia population is estimated to reach 152·9 million cases by 2050 [6], with the prevalence of MCI reaching 15·6 % [7]. However, not all individuals with MCI will progress to dementia, leading this stage to be identified as a potential target for early diagnosis and interventions to prevent the onset of dementia in older populations [7], especially across Southeast Asia (SEA). Given the large population of SEA of almost 700 million or 8·5 % of the global population [8], and that Southeast Asians are at increased risk of developing MCI and dementia [9], efficient and scalable diagnostic processes and algorithms are urgently needed.

Dementia places a significant burden on patients, caregivers and national healthcare systems [10]. The global economic burden of Alzheimer's disease and related dementias is projected to increase to USD $16·9 trillion in 2050, up from USD $2·8 trillion in 2019 [11]. This is of increasing concern specifically in SEA given the rapidly aging population [12]. There is no official estimate of MCI prevalence in SEA due to varying diagnostic criteria, insufficient healthcare resources, cultural norms such as the unwillingness to seek medical advice for memory and mental issues, and a general lack of awareness of early symptom presentation [13].

The main strategy to tackle the increasing incidence of MCI is to improve current management and early diagnostic practices across SEA. This consensus paper, as part of Southeast Asian countries' collaborations, aims to understand the current state of diagnostic and management practices, to develop evidence-based improvements and to tailor these practices towards southeast Asian populations.

The Southeast Asian Consortium on Neurocognition, Neuroimaging and Biomarker Research (SEACURE) first convened in 2023 and consists of experts including neurologists, psychiatrists and geriatricians representing six countries – Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam. The five key objectives of SEACURE include: understanding the epidemiology of MCI and dementia in SEA; to study the biological mechanisms of cognitive disorders in SEA; to develop non-pharmacological and pharmacological interventions catered to the southeast Asian phenotype; to support member institutions with data processing (neuroimaging, neuropsychological assessments and fluid biomarkers) in a harmonized, shared manner; and to develop digital platforms for diagnostics and therapeutics of cognitive disorders.

In the most recent meeting, SEACURE members convened to address the first objective by consolidating information on MCI diagnostic and management practices to represent the current landscape in SEA. Additional discussions included strategies to tackle issues regarding early diagnosis, management and preparedness for future advances in MCI diagnosis and management.

2. Methods

The data collection phase included a pre-meeting online survey and an in-person meeting. SEACURE members completed an online survey between July and August 2024 regarding their MCI diagnostic and management practices prior to the meeting. The survey included questions on patient numbers and profiles, current diagnostic practices, current management strategies, challenges faced in diagnosing and managing MCI and future strategies to improve these practices. The questions were a combination of quantitative and qualitative, and included multiple-choice and open-ended responses.

An in-person consensus meeting was subsequently held in August 2024 which was attended by five experts from Singapore, four from Malaysia, two from Philippines, two from Indonesia, two from Vietnam and one from Thailand. During the in-person meeting, the survey results were shared item-by-item and further inputs as well as clarifications were sought for each of the survey items. The pre-meeting survey results and inputs obtained during the consensus meeting, taken together represents the current state of MCI management and diagnosis in SEA. All members reviewed the final manuscript and reached a consensus on each statement presented in this paper.

3. Results

3.1. Patient numbers and profiles in memory clinics

The average number of new patients referred to a dementia specialist with a possible diagnosis of MCI in memory clinics across SEA ranges from 10 to 100 per month (Table 1). Approximately 15–20 % of these patients are eventually given an MCI diagnosis. MCI is diagnosed using either the Petersen's criteria or the National Institute on Aging and Alzheimer's Association criteria.

Among those given a diagnosis of MCI, about half present with a predominant complaint of memory difficulties and are given a diagnosis of amnestic-MCI. The experts also shared that 80 % of patients diagnosed with MCI in their respective clinics, typically present with risk factors for cerebrovascular diseases, such as obesity, hypertension, hyperlipidaemia, diabetes or a history of a symptomatic stroke.

3.2. MCI diagnostic practices

All clinicians reported that they collect a detailed informant and patient history, followed by cognitive evaluation, neuroimaging and blood biochemistry testing for newly diagnosed MCI patients. Vietnam, Singapore and Philippines currently conduct routine cognitive evaluation for patients with potential MCI. Blood biochemistry include thyroid panels and vitamin B12 levels for all patients. Selected patients may also be evaluated for neurosyphilis and HIV depending on their risk profiles. Neuroimaging would typically include MRI brain scans or CT brain scans. Clinical cerebrospinal fluid (CSF) testing is currently only being conducted in Singapore and Thailand for selected patients depending on their risk profile. CSF parameters routinely evaluated include Amyloid-β40 and 42, phosphorylated tau and total tau. Thailand and Philippines are the only southeast Asian countries conducting Apolipoprotein E4 (APOE4) genetic testing and offering genetic counselling prior to testing in memory clinics. In the Philippines, genetic counselling and the interpretation of results is conducted by dementia specialists.

National health screening programmes which include cognitive screening are available in Malaysia, Indonesia and Thailand. However, these are not being consistently implemented in memory clinics (Table 2). In contrast, the national health screening programs in the other countries do not include cognitive screenings. In Malaysia and Indonesia, Muslims who register to go for the Hajj pilgrimage are required to undergo cognitive screening.

3.2.1. Cognitive evaluation tools

The most widely used cognitive evaluation tool in southeast Asian memory clinics is the Mini-Mental State Examination (MMSE) [14], followed by the Montreal Cognitive Assessment (MoCA) [15]. The Visual Cognitive Assessment (VCAT) is being used in Singapore, Malaysia and Indonesia in selected memory clinics [16,17]. Less commonly used tools include the Quick Dementia Rating System (QDRS) [18], Elderly Cognitive Assessment Questionnaire (ECAQ) [19], Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) [20], and the Vietnam Cognitive Assessment (VnCA) (Supplementary Figure 1).

3.2.2. Neuropsychological assessments

Services for neuropsychological assessment (NPA) by psychologists are available in all countries. However, referral for NPA is not routinely

Table 1
Summary statistics on patient profiles

Question	Singapore	Malaysia	Philippines	Indonesia	Vietnam	Thailand
On average, how many new patients with Mild Cognitive Impairment (MCI) do you see in your practice each month?	20 –100	10 - 80	10 - 20	10 - 20	10	50
In your memory clinic, what proportion of patients have MCI?	20 %	10 %	10–15 %	10 %	10 %	20 %
What percentage of MCI patients you see each month are classified as amnestic?	60 %	50–60 %	60 %	50–60 %	40–50 %	60 %
What proportion of your MCI patients are likely to have cerebrovascular disease and/or cerebrovascular risk factors?	80 %	75 %–80 %	80–90 %	75 %	50 %	80–90 %

Table 1. Summary of responses from SEACURE members representing Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam regarding their patient numbers per month and patient profiles for new patients seen in their respective memory clinics.

Table 2
Summary of diagnostic practices

Question	Singapore	Malaysia	Philippines	Indonesia	Vietnam	Thailand
Do you conduct interviews with patients and/or informants?	Yes	Yes	Yes	Yes	Yes	Yes
In your clinic, do you routinely conduct cognitive evaluation for new patients with potential MCI?	Yes	No	Yes	No	Yes	No
Do you utilize MRI scans or blood test for potential MCI patients?	Yes	Yes	Yes	Yes	Yes	Yes
Do you perform genetic screening in the clinic such as APOE4 testing? (Do you provide genetic counselling prior to conducting genetic screening?)	No	No	Yes (yes)	No	No	Yes, for early onset dementia/MCI (yes)
At the national level in your country, do routine health screening programs include cognitive screening?	No	Yes, but it is not widely implemented at the primary care level Muslims going to Hajj have to go through compulsory cognitive screening	No	Yes, but it is not being implemented on the ground Muslims going to Hajj have to go through compulsory cognitive screening	No	Yes, but it is not widely implemented at the primary care level

Table 2. Summary of the diagnostic practices implemented in SEA memory clinics for incoming patients at the clinic and national level.

performed for all patients with MCI but is reserved for patients with diagnostic uncertainty as well as those with medicolegal issues. The lack of psychologists was cited as the reason for selective NPA referrals. Within the NPA protocols of the various memory clinics, the most widely used neuropsychological test items included the Trail Making Task (TMT) [21], followed by the Boston Naming Test (BNT) [22]. Tests of episodic memory such as the Weschler Adult Intelligence Scale (WAIS) [23], Rey Auditory Verbal Learning Test (RAVLT) [24], Rey Complex Figure Test (RCFT) were also often included in the NPA [25]. The Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) [26] is less commonly used in SEA (Supplementary Figure 2).

3.2.3. Magnetic resonance imaging (MRI)

MRI was routinely offered to patients with MCI in memory clinics for all six countries. The most widely used MRI sequences in the MRI protocol included T1-weighted and T2-weighted imaging.

Most centres also included Diffusion-Weighted Imaging (DWI) to exclude acute cerebral infarcts. Fluid-Attenuated Inversion Recovery (FLAIR) was often included to evaluate for evidence of cerebral small vessel disease. Gradient Echo (GRE) and Susceptibility-weighted Imaging (SWI) were routinely performed to evaluate the presence of microbleeds. Other MRI methods include Computed Tomography (CT), Magnetic Resonance Angiography (MRA) and Arterial Spin Labelling (ASL) (Supplementary Figure 3).

3.2.4. Blood-based biomarkers

SEA memory clinics do not currently offer clinical evaluation of blood-based biomarkers. However, several memory clinics in Singapore and Thailand have concurrent research programmes with blood-based biomarker evaluation. The common biomarkers evaluated for research include Glial Fibrillary Acidic Protein, Neurofilament Light Chain, pTau181, pTau217, Amyloid-beta 40 and 42 (Supplementary Figure 4).

3.3. MCI management practices

The average follow-up interval period for MCI patients is six months after the initial diagnosis for memory clinics across SEA. All clinicians conduct interviews with patients and caregivers during follow-up consultations. Majority of clinicians perform cognitive evaluation tests and 50 % perform follow-up neuropsychological assessments, additional neuroimaging and blood tests to track the progression of MCI.

All clinicians said they offer lifestyle advice (e.g. dietary change, exercise etc.) to MCI patients. Majority said their memory clinics offer non-pharmacological interventions such as one-to-one therapy and group-based activities. For pharmacological intervention strategies, majority reported that patients are prescribed with gingko biloba preparations [27,28] followed by Omega-3, vitamin B complex, vitamin D, and cholinesterase inhibitors. Additionally, clinicians in Vietnam are offering transcranial magnetic stimulation as a non-invasive intervention strategy for MCI.

3.4. Role of digital solutions and disease modifying therapy

At present, digital tools and wearables for the screening, diagnosis and management of MCI are not being used in clinical settings but are available in research settings. There is significant interest across SEA in using digital solutions in clinical practice for more in-depth monitoring of MCI progression, however there are barriers to doing so. These include a lack of knowledge in interpreting and communicating the results of such tools, especially to patients who may not be able to comprehend the information, and the lack of commercially available and clinically validated digital tools. The clinicians shared that despite the barriers,

digital diagnostics and therapeutics could fill the gap in terms of lack of manpower to perform cognitive evaluation as well as to increase detection of MCI in community and primary care settings.

All clinicians were of the opinion that disease-modifying therapy including anti-amyloid therapy (e.g. lecanemab and donanemab) may be useful in managing patients with MCI in their clinics. However, many clinicians shared that to be able to offer disease-modifying therapy in memory clinics, certain basic requirements must be met including availability of Positron Emission Tomography Amyloid imaging; facilities for cerebrospinal tap and analyses; sufficient MRI capacity to monitor for side-effects such as amyloid related imaging abnormality (ARIA), and infusion centres. Currently, Singapore and Philippines are preparing to offer this treatment, while the remaining Southeast Asian countries are working towards adopting this approach.

3.5. Challenges faced and strategies to improve the diagnosis and management of MCI

Clinicians face the challenge of not having adequate resources and capacity to conduct in-depth cognitive evaluation for incoming potential MCI patients. Additionally, some clinics are not reimbursed for the costs of these tests if the patient is eventually found not to be at risk of MCI or dementia.

The strategies highlighted across Southeast Asian countries to improve the management of MCI include:

a) to increase awareness and knowledge of MCI through programmes targeting the community and primary care physicians
b) to encourage wider screening of patients at community settings, primary care clinics, screening of patients having risk factors such as those having diabetes mellitus, hypertension or past history of strokes
c) resources to collect normative data and validation of cognitive screening tests for respective countries
d) develop and validate novel digital-based diagnostic tests for use in the community and healthcare settings
e) increasing resources and capacity to perform in-depth consultations including having more psychologists and clinicians in primary care settings
f) the increased need for clinically validated blood-based biomarker testing for amyloid and tau pathology
g) inclusion of cognitive screening in national health screening programmes for older populations

4. Conclusion

The SEACURE consensus on MCI highlights that in the southeast Asian context, there is a sizeable proportion of patients with MCI attending memory clinics in the respective countries. The consensus also demonstrate that amnestic MCI is the more prevalent type of MCI and the majority of patients with MCI have concomitant cerebrovascular risk factors or cerebrovascular disease including white matter hyperintensities. MCI diagnostics primarily rely on patients' history, caregiver information, and cognitive evaluation tests. A limitation of the current consensus was adopting a more liberal approach in discussing MCI rather than focusing on the individual subtypes such as MCI of the vascular and AD types. With the advent of monoclonal antibodies for MCI of the AD type, future consensus will specifically address the diagnosis and management of MCI based on subtype. Genetic screening, such as testing for APOE4, and blood-based biomarkers are not commonly performed for at-risk patients. This also includes mutations of the APP, PA1 and PS2 genes.

For follow-up visits, MCI patients typically undergo additional assessments, including neuropsychological evaluations, MRI scans, and blood-based biomarker tests, to exclude other potential causes. Currently, MCI treatment is largely focused on lifestyle modifications. While disease-modifying therapies show promise, many southeast Asian countries still face challenges related to adequate facilities and capacity for specialist healthcare manpower.

Current MCI diagnostic and management practices differ across southeast Asian countries primarily due to differences in cultural, lingual and healthcare resource availability. Several of these issues can potentially be resolved through the use of digital tools for MCI screening, diagnosis and management, specific to the southeast Asian phenotype. Digital tools would significantly reduce manpower and healthcare infrastructure costs [29] but would require raising awareness about digital tools and MCI in local communities. There may be some hesitation amongst older individuals in using such novel tools [30], and other anticipated concerns such as translations to local languages and dialects which would need to be handled appropriately by taking into consideration local cultural ethos. While digital literacy is increasing worldwide, there may be certain subsets of populations who are unable or unwilling to use complex digital tools. We recommend using these tools to supplement traditional clinical diagnostic and management methods on a case-by-case basis.

Developing and validating such evidence-based digital tools and blood-based biomarkers requires large samples of MCI patients who have undergone the traditional battery of diagnostic tests including neuropsychological assessment, blood-based biomarker testing and neuroimaging. It would thus be prudent to pool together data from participating southeast Asian countries to establish such digital tools and blood-based biomarkers. This would also help identify potential intervention targets for community-based intervention programs to prevent the onset of MCI or delay the progression from MCI to dementia.

It is imperative that southeast Asian countries collaborate and continually engage in discourse to improve the landscape of MCI across SEA. This is of major concern given rapidly aging populations in all SEA countries.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.tjpad.2025.100110.

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