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DOI: https://doi.org/10.3399/BJGPO.2024.0039

To access the most recent version of this article, please click the DOI URL in the line above.

Received 06 Febuary 2024
Revised 03 May 2024
Accepted 05 August 2024

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Word count: 2.492

Tables: 4

Figures: 1

Running head: MoCA use in general practice.

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Table 1: Socio-demographic characteristics of the investigating GPs

Features	Number of GPs concerned [n = 61]	Percentage [%]
Type		
Female	43	70
Male	18	30
Type of practice		
Single practice	8	13
In a group	53	87
Number of GPs in the practice structure		
2	11	21
3	6	11
4	2	4
5	3	6
7	31	58
Exercise structure		
Medical practice	43	71
Health centre	2	3
MSP	16	26
Practice environment		
Rural	2	3
Semi-rural	48	79
Urban	11	18
Type of patient (majority)		
Geriatric	0	0
Paediatrics	1	2
Varied	59	96
Other: Gynaecological and paediatric referral	1	2

MoCA use in general practice for the early detection of cognitive impairment.

ABSTRACT

Background: GPs can detect cognitive impairment at a very early stage, allowing early support for people and their caregivers. The early onset of cognitive impairment is between 50 and 60 years. Currently, in France, the Mini Mental State Examination remains the most used screening test, though it has a lower sensitivity and specificity than the Montreal Cognitive Assessment (MoCA) for detecting mild cognitive impairment, taking an average of 15 minutes to complete.

Aim: To investigate the feasibility of the MoCA during routine consultations in general practice for the early detection of cognitive impairment and to determine prevalence of cognitive impairment in a primary care setting.

Design and setting: A quantitative, prospective feasibility study was carried out in real-life working condition during routine consultation.

Method: GPs performed MoCA on adults aged 50 years and older, without suspected or confirmed cognitive impairment.

Results and Conclusion: 61 GPs performed 221 MoCA with a mean duration of 8 minutes and detected mild neurocognitive impairment in 62% of patients. The MoCA is feasible and easy to perform during routine consultations in general practice by trained and experienced physicians.

How this fits in?

- Early screening of mild cognitive impairment optimizes person-centred accompaniment.
- The Montreal Cognitive Assessment is a reliable screening tool for cognitive impairment.
- We showed that mild cognitive impairment was prevalent in general practice.
- We can encourage GPs to screen for cognitive impairment during routine consultation.

1. INTRODUCTION

In France, more than three million people were affected by Alzheimer's disease or a related dementia in 2019, including about 1.2 million patients and 2 million caregivers (1,2). It is estimated that 2 million people will be affected by 2050 (1,2).

There is currently no cure for neurodegenerative diseases. In general, the disease onset is slow, allowing people to remain active in society from the outset. Early detection is essential from a medical-social point of view to enable people to maintain independence as long as possible.

General practitioners (GPs) have a crucial role to play (3) by screening for cognitive impairment (CI) to provide early support to the person and caregivers (4,5).

As the minimum age for the onset of CI ranges from 50 to 60 (6), it seems appropriate to screen for it at this age.

Several tests are available: the Mini Mental State Examination (MMSE), the General Practitioner assessment of Cognition (GP-COG) and Montreal Cognitive Assessment (MoCA) are the best known.

In France, screening for CI in general practice is encouraged and possible for the same person once a year. This dedicated consultation includes not just the cognitive assessment but also the announcement of the results and, if necessary, programming of complementary investigations such as blood analysis or brain MRT. Considering the time spent for such kind of consultation, this offer (ALQP006) values 69.12 euros, completely reimbursed to the patient by the National Health Insurance Fund (NHIF), which covers a limited list of approved tests (7,8). To date, the MoCA has not been included in this restrictive list.

In France, GPs use the MMSE most (5), among 505 GPs, 76% reported to use it (9), since MMSE was recommended by a consensus conference in 2000 for screening for dementia (10), needing 10 to 15 minutes to be administered (11) by a trained person (12).

The GP-COG has been validated for screening for CI in general practice. It takes an average of 5 minutes to complete (13) and is a robust and consistent tool (14–16).

The MoCA is best suited to screening for mild CI (12,17).

The MoCA has been compared with the MMSE (12). The MoCA is more sensitive and specific than the MMSE for screening for CI in people aged over 60 (12,18) and for the early detection of mild CI (90% sensitivity compared with 18% for the MMSE). The MoCA is not a substitute for the MMSE, which is suitable for moderate to severe CI (13,17).

No early screening test for CI is recommended in general practice (13,19).

The primary aim of this study was to investigate the feasibility of using the MoCA during routine consultations in general practice for the early detection of CI.

Secondary aims were to identify prevalence of CI in a primary care setting, and to determine any difficulties encountered by GPs and patients in completing the MoCA.

2. METHODS

2.1 Study design

A quantitative, cross-sectional study feasibility study was carried out in the Hauts de France region between November 2022 and April 2023.

Since GPs prefer to use the MMSE, taking 10-15 minutes to complete, we set the feasibility of the MoCA at less than 15 minutes. The primary endpoint was the feasibility of the MoCA during a feasibility threshold set at a maximum of 15 minutes. The presence of any difficulties experienced by the GP or patient in performing the MoCA has been reported in an open-ended questionnaire after the test.

2.2 Study population

People aged 50 and over on the active list of GPs practising in Hauts-de-France participated. The inclusion criteria were men and women aged 50 and over who volunteered to take part in the study and who were able to complete the MoCA (having a good command of French) and to follow the instructions of the investigating GP.
The non-inclusion criteria were people under 50 years of age and/or with a history of dementia or CI already diagnosed.

2.3 Recruitment

We invited 301 GPs by e-mail. Their e-mail addresses were obtained through acquaintances and GP networks (GP trainee trainer, university GP teacher). Attached to the email, they received an invitation page explaining the background and interest of this work, a tutorial on how to use and score the MoCA in French version 8.3, and a patient information page explaining the purpose of the test and how to use it. They were also sent a link to complete the questionnaire online.

2.4 Data collection

An online questionnaire was created on Lime Survey® to collect the MoCAs completed by the GPs. The questionnaire consisted of three parts:
1) Socio-demographic data on the GPs: gender, age, practice location, patient profiles, etc.
2) Data on screening for CI: knowledge and use of the ALQP006 score, reasons for non-use, and opinion on the likely under-screening of CI in general practice.
3) The patient's socio-demographic data (gender, age, level of education) were then completed before the MoCA was administered. The start and end times of the test were recorded. After the test was completed, the GP reported any difficulties encountered by him/herself and/or the patient. These data were collected using an open-ended questionnaire. For the analysis, we listed each of the difficulties that might have been encountered by the doctor and the patient, and then tallied the responses. The test was scanned into the Lime Survey® questionnaire in png, gif, doc, odt, jpg or pdf format. This last part was repeated if the GP wanted to include more patients (maximum 10 patients).

2.5 Ethics

The study was authorised by the CNIL (French Data Protection Authority) under the reference 2022-265. Prior to the study, the creators of the MoCA were contacted to obtain authorisation to use the test for unfunded research purposes.
Patients were informed of the study aim and reminded that this was voluntary, confidential, and anonymous. According to the result of the test, the GP proceeded to complementary investigations, if necessary and accepted by the patient. These investigations could include several steps: a prescription analysis to identify iatrogenic causes for the CI, blood analysis, an audition and vision check, brain MRT followed by neurological visits or not.

2.6 Duration of the study

Data collection began with an e-mail sent on 8 November 2022 and ended on 12 April 2023.

3. RESULTS

Of the 301 GPs invited, 61 agreed to participate. A total of 221 MoCAs were carried out.
Table 1 summarises the socio-demographic characteristics of the investigating GPs.

Table 1: Socio-demographic characteristics of the investigating GPs

All the GPs were self-employed in their private office. We did not recruit any salaried doctors, locums, neither GPs with mixed activity. Of all GPs taking part in the study, 70% work in a GP office, 26% in a multiprofessional primary care structure and 3% in a health center. For all GPs, the average length of time in practice was 21.7 years (1;36). Among the 61 GPs, 31 (51%) had already carried out screening tests for CI.

Of the 31 GPs who had performed cognitive screening tests, 19 had performed the MMSE and 5 the MoCA. The Dubois 5-word test and the clock test had been performed by 4 and 3 GPs respectively, 11 did not report which tests they had done.
The ALQP006 score was known by 48 GPs (79%). Only half of them used it.
Of the 24 GPs who knew about the score but did not use it, two said they did not use it because it was too time-consuming, two others said they had forgotten about it, and 20 said they were not concerned. Under-screening for CI in general practice was reported by all but one of the GPs.

MoCA analysis

Table 2 shows the patients' characteristics.

Table 2: Characteristics of patients for whom the MoCA was performed.

The mean age of patients undergoing MoCA was 66 years [50-90], with 23% in the 56-60 age group. The MoCA took an average of 8 minutes to complete (Figure 1). 82% of the tests were completed in 10 minutes and 97% in less than 15 minutes.

Figure 1: Average time taken to complete the MoCA

GPs feedback

The GPs were asked to answer an open-ended question after the realization of the MoCA about possible difficulties.
Through the free commentaries, GPs declared positive experience of performing the MoCA test especially regarding the easy and quick use of it in daily practice. Three GPs among those who already performed cognitive tests in the office declared to prefer to use the MoCA instead of MMSE since their study participation. Five GPs among those who never used cognitive tests before, where happy to discover the MoCA as an easy and reliable tool.

The difficulties encountered by 3 GPs in carrying out the MoCA, concerned 3 patients and were related to the patient's understanding of the instructions and his deafness, which required the instructions to be repeated.

Difficulties encountered by patients (table 3) could be related to a lack of concentration, sometimes leading to a misunderstanding of the instructions, requiring them to be repeated. This lack of concentration caused them to rush through the exercises, leading to inattention errors. Anxiety about the test, combined with a desire to do well, could make it difficult for the patient. Lack of perseverance or low self-esteem could lead to a loss of motivation to continue with the exercise and thus distort the test result.

Sensory impairments, such as hearing or visual problems or tremor, could make the test difficult to perform, especially if they are not compensated by a hearing aid or optical correction.

Table 3: **Difficulties encountered by people subject to the MoCA.**

Of the 221 MoCAs performed, 137 (62%) identified mild CI (between 18-25/30 points in the test), 9 (4%) moderate CI (between 10-17/30 points in the test), and 75 (34%) normal results (>26/30 points). No patients with severe CI (<10/30 points in the test) were identified.

4. DISCUSSION

4.1 Summary

Sixty-one GPs performed a total of 221 MoCA tests among their patients without any prior known CI and 62% of positive tests identified mild CI. This study confirmed an easy and quick MoCA use during routine consultations in general practice.

GPs experienced difficulties in performing the MoCA were related to the patient's deafness.

Patients reported some difficulties around lack of concentration leading to poor understanding of instructions.

Strengths and Limitations

A more comprehensive approach of data highlighting GPs' views of the MoCA initiative would have been insightful in terms of explaining why this intervention may or may not have worked well.

The survey period was busy for GPs due to the winter epidemics. No reminder emails were sent to them, to respect their workload and lack of time.

GPs did not necessarily carry out the MoCA during a specific consultation. People came in for other reasons. There was probably a lack of concentration on the part of the patients, who were caught off guard.

Investigator bias should be considered when one of the factors for incomprehension is a lack of clarity due to a lack of time taken by the investigator to give instructions.
Sensory impairments, such as hearing or visual problems, could constitute a functional bias for the patient.

4.3 – Comparison with existing literature

Recent studies focused on the use of cognitive testing in primary care settings to diagnose CI among symptomatic people (20, 21).
We used the MoCA test among apparently asymptomatic people to assess even mild CI to promote a very early detection of CI to anticipate a person-centered accompaniment of patients and their entourage.
Federman et al. used a similar study design and inclusion criteria to assess the MoCA among a primary care sample of 872 Americans without prior suspicion of CI (21). Our results are comparable regarding our mean ages 66 years in our sample vs 66,8 years old in Federman, as well as the gender distribution with more females in both studies (21). Federman diagnosed CI in 20.8% of subjects (mild CI in 10.5% and moderate-severe CI, 10.3%) (21) whereas we identified in our sample 62% of mild CI.
These differences could be explained by the fact that in our sample, 22% of the participants met difficulties during the test (table 3).
However, Stimmel et al. used the English and Spanish version of MoCA among 231 participants in an outpatient primary care setting, with mean age 73, (72% women) and had similar results for mild CI with 57% (n=133) (22).
Nevertheless, we must keep in mind that the MoCA may sometimes lead to high false-positive rates in diverse ethnoculturally and linguistically circumstances (22).
Among our sample, six participants (12%) had hearing problems. The team of the MoCA creator has meanwhile developed and validated the Montreal cognitive assessment for people with hearing impairment (MoCA-H) which is a sensitive and reliable means of identifying dementia among adults with acquired hearing impairment (23).
In another study of Federman et al., depression was strongly associated with previously undetected CI among a sample of 855 participants with a mean age of 66.8 years old, so again comparable with our sample. We ignore prevalence of depression in our sample, as far as our main objective was to perform the MoCA during routine consultations (24).

4.4 - Implications for Research and practice

Many people are worried about CI, either because of family history or because it is a frightening condition sometimes difficult to discuss with GPs and most GPs believed that CI is under-screened in general practice.
The suggestion of a screening test by the GP may help to reassure patients through a dialogue about prevention of a possible risk of social isolation.

The ease of use of the MoCA, combined with the ability to score it, will optimise early screening for CI in general practice.

GPs found the MoCA to be quick and easy to use and patients were satisfied with this cognitive screening consultation. To promote the MoCA use in general practice, it might be worth including it in the restrictive list defined by the NHIF for cotation as a test for early screening for mild CI.

However, we want here to remind how to optimize screening conditions (table 4).

Screening for CI is not limited to a single test but an overall assessment, based on a range of clinical, cognitive, functional, and behavioural factors (13). Repeating the tests gives confidence in carrying out the procedure, which then quickly becomes part of the GP's daily practice. However, we need to be aware of the screenings' harms, such as leading to overdiagnosis (25).

If a CI is detected, the GP should carry out a full bio-psycho-social assessment of the patient, including close family and friends.

The GP will provide appropriate support to ensure the patient's independence as long as possible through therapeutic training for the patient and caregivers and the introduction of assistive devices (5). As the disease progresses, respite platforms may be used, before, if necessary, early admission to an appropriate institution could be considered (1).

Conclusion

This study confirms the quick and easy MoCA use during routine consultations in general practice to screen for early CI from the age of 50. 62% of the patients had mild CI, highlighting the importance of early screening to promote early support for patients and their entourage.

Funding:
No funding or other material support was sought or received to perform this work.

Ethical approval:
The study was authorised by the CNIL under reference 2022-265. Prior to the study, the creators of the MoCA were contacted to obtain authorisation to use the test for unfunded research purposes.

Competing interests:
All authors declare no competing interests.

Acknowledgments:
We wish to thank all the participating GPs and patients.

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Abbreviations

ANAES: Agence Nationale d'Accréditation et d'Evaluation en Santé (French National Agency for Health Accreditation and Evaluation)

BEP: Brevet d'Etudes Professionnelles (vocational diploma)

BTS: Brevet de Technicien Supérieur (Higher Technical Certificate)

CAP: Certificat d'Aptitude Professionnelle (vocational aptitude certificate)

CNIL: Commission nationale de l'informatique et des libertés (French Data Protection Authority)

DMG: Department of General Medicine

EHPAD: Etablissement d'Hébergement pour Personnes Agés Dépendantes (Residential establishment for dependent elderly people)

FMC: Continuing Medical Education

GP-COG: General Practitioner Assessment of Cognition

MMSE: Mini-Mental State Examination

MoCA: Montreal Cognitive Assessment

MSP: multi-professional health centre

Table 2: Characteristics of patients for whom the MoCA was performed.

Features	Number of patients concerned [n=221]	Percentage [%]
Type		
Female	147	67
Male	74	33
Age range of patients		
50-55 years old	29	13
56-60 years old	50	23
61-65 years	41	19
Aged 66-70	40	18
71-75 years	27	12
76-80 years	14	6
>80 years	20	9
Patients' level of education		
Study certificate	31	14,03
French Certificate of General Education	18	8,14
CAP / BEP	75	33,94
BAC	28	12,67
Higher education	52	23,53
Stop at 12	2	0,9
Stopped at 14	3	1,36
Stop at 16	5	2,26
Stop in 6ème	1	0,45
Did not go to school	2	0,9
BTS	4	1,81

Table 3: **Difficulties encountered by people subject to the MoCA.**

Type of difficulties encountered by the patient	**Number of patients concerned (n=48)**	**[%]**
Lack of perseverance/devaluation	8	17
Calculation	3	6
Language	1	2
Indication	1	2
Dyslexia	1	2
Anxiety about taking the test	2	4
Tongue barrier	1	2
Understanding instructions due to lack of concentration	**13**	**27**
Lack of concentration when doing exercises	3	6
Slowness in carrying out exercises, wanting to do things right	3	6
Acute infection	1	2
Hearing problems	6	12
Visual disorders	7	14
Trembling	6	12

Table 4 : Optimizing screening conditions for cognitive impairment in general practice

Before screening for cognitive impairment,

1. Inform the patient clearly and fairly about the nature of the test and possible consequences, such as complementary exams if needed (3).
2. Obtain patient's consent to the test (3).
3. Ensure that there has been no acute somatic or psychological episode (4).
4. Anticipate that patients may have difficulty concentrating.
5. Ensure that there are no visual or hearing impairments that may lead to bias (13).
6. The trustful relationship between the GP and the patient facilitates this screening.

Figure 1: Average time taken to complete the MoCA.