Diagnostika in zdravljenje demence v Zdravstvenem domu Radovljica – retrospektivna študija

Diagnostics and Treatment of Dementia in Radovljica Health Center – A Retrospective Study

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Izvleček

Namen: *Namen raziskave je bil preveriti, ali imajo bolniki z na novo diagnosticirano demenco opravljeno oceno kognitivnega stanja in katero diagnostično orodje je bilo za to uporabljeno. Prav tako smo preverili, če so opravili laboratorijsko in slikovno diagnostiko. Zanimalo nas je še, ali so jim zdravniki družinske medicine uvedli antidementiv ali jih napotili h kliničnemu specialistu (nevrologu ali psihiatru).*

Metode: *Opravljena je bila retrospektivna kvantitativna raziskava v Zdravstvenem domu Radovljica za opazovano obdobje od 1. 1. 2014 do 31. 12. 2018 z analizo njihove zdravstvene dokumentacije.*

Rezultati: *V raziskavo je bilo vključenih 98 bolnikov, od tega 28,6 % (n = 28) moškega in 71,4 % ženskega*

Abstract

Aim: *The aim of this study was to determine whether patients with newly diagnosed dementia underwent an assessment of cognitive status and which assessment tool was used. We also examined whether patients underwent laboratory and imaging diagnostics and investigated whether they were prescribed anti-dementia medication by their family physician or referred to a clinical specialist (neurologist or psychiatrist).*

Methods: *A retrospective quantitative study was conducted at the Radovljica Health Center, based on an analysis of patients' medical records from January 1, 2014, to December 31, 2018.*

Results: *The study included 98 patients, 28.6% males (n = 28) and*

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(n = 70) spola, starih od 75 do 96 let. V povprečju so imeli 3,7 kroničnih nenalezljivih bolezni, najpogosteje arterijsko hipertenzijo 81,6 % (n = 80) bolnikov in hiperlipidemijo 41,8 % (n = 41) bolnikov. Povprečno je imel obravnavan bolnik 4,2 rednih zdravil. Kognitivno stanje je bilo ocenjeno pri 19,4 % (n = 19) bolnikih, največkrat je bil uporabljen KPSS pri 89,5 % (n = 17) bolnikih; sledila sta TRU pri 5,3 % (n = 1) bolnikov in MocCA pri 5,3 % (n = 1) bolnikov. V letu diagnoze so bile opravljene laboratorijske preiskave pri 88,8 % (n = 87) bolnikov, od tega osnovne laboratorijske preiskave pri 65,3 % (n = 64) bolnikih. Na slikovno diagnostiko je bilo napotenih 25,5 % (n = 25) bolnikov. H kliničnem specialistu je bilo napotenih 79,6 % (n = 78) bolnikov, 28,6 % (n = 28) k psihiatru in 51,0 % (n = 50) k nevrologiji. Ob določitvi diagnoze demenca je bil pri 9,8 % (n = 10) uveden anitdementiv s strani zdravnika družinske medicine.

***Zaključek:** Ta raziskava je ugotovila, da pri diagnostiki in zdravljenju demence na primarnem nivoju obstaja prostor za izboljšavo obravnave (kognitivna ocena, laboratorijske preiskave, slikovna diagnostika). Predvsem pa je potreben napredek pri samostojnem uvajanju antidementiva s strani zdravnikov specialistov družinske medicine.*

71.4% females (n = 70), aged 75 to 96 years. Patients had average of 3.7 chronic non-communicable diseases, most commonly arterial hypertension (81.6%, n = 80) and hyperlipidemia (41.8%, n = 41). Patients were prescribed an average of 4.2 regular medications. Cognitive status was assessed in 19.4% (n = 19) of patients; the Mini-Mental State Examination (MMSE) was used most frequently (89.5%, n = 17), followed by the Clock Drawing Test (CDT) and the Montreal Cognitive Assessment (MoCA) in 5.3% (n = 1) of cases each. In the year of diagnosis, laboratory tests were performed in 88.8% (n = 87) of patients, of whom basic laboratory tests were conducted in 65.3% (n = 64). A total of 25.5% (n = 25) of patients were referred for imaging diagnostics, while 79.6% (n = 78) of patients were referred to clinical specialists: 28.6% (n = 28) to psychiatrists and 51.0% (n = 50) to neurologists. Anti-dementia medication was initiated by family medicine physicians in 9.8% (n = 10) of cases at the time of diagnosis.

***Conclusions:** This study found that there is room for improvement in the diagnosis and treatment of dementia at the primary care level (cognitive assessment, laboratory tests, and imaging diagnostics). In particular, progress is needed in the independent initiation of anti-dementia medications by family medicine physicians.*

INTRODUCTION

Dementia is one of the most pressing public health challenges of modern times. With an aging population, the global burden of this disease is expected to rise steadily. According to the World Health Organization, dementia affects more than 55 million people worldwide, with nearly 10 million new cases diagnosed annually (1). Projections indicate that by 2050, 52 million people will be living with dementia (2). The incidence of disease increases exponentially with age, from 3.1 per 1,000 persons in the 60–64 age group to 175 per 1,000 persons in individuals over 85 years of age (3). Globally, approximately 7.7 million new cases are expected each year—equivalent to one new case every 4.1 seconds (3).

Dementia is a disease characterized by a decline in cognitive function such as memory, thinking, orientation, comprehension, calculation, learning ability, language, and judgment. The degree of decline exceeds what is expected for the individual's age and interferes with daily functioning. The most common forms of dementia include Alzheimer's disease, vascular dementia, dementia with Lewy bodies, and frontotemporal dementia (4). However, not all cognitive impairment is irreversible. Conditions such as vitamin deficiencies, depression, delirium, hypothyroidism, and adverse drug effects may cause

dementia-like symptoms that are treatable.

Family medicine specialists (FMS) are often the first point of contact for patients, and therefore, play crucial roles in the early recognition of dementia and in distinguishing between reversible and irreversible causes. Countries such as the USA, Canada, and Italy have acknowledged the importance of primary care in dementia management and have developed programs based on interdisciplinary collaboration between family physicians and other healthcare professionals (5,6).

A variety of tools are available for the quantitative assessment of cognitive decline, including the Mini-Mental State Examination (MMSE), Clock Drawing Test (CDT), Addenbrooke's Cognitive Examination-Revised (ACE-R), Test Your Memory (TYM), and Montreal Cognitive Assessment (MoCA) (5,7). In Slovenia, two validated and standardized screening tests are used in clinical practice: MMSE and CDT (8,9). At the primary care level, MMSE is used the most (10). It is a short test with a maximum score of 30 points and is a useful screening tool, though relatively insensitive to mild impairment, particularly in highly educated individuals, for whom test modification may be necessary (11). By contrast, CDT is a rapid test requiring approximately 2 minutes to perform, with a reported specificity of 81% and sensitivity of 76% (12,13). Despite the availability of such tools, approximately 65% of dementia cases in primary care remain undiagnosed, delaying timely implementation of care planning and disease management strategies (2,14).

Laboratory testing helps identify reversible or contributing causes of cognitive decline. The basic laboratory test panel includes glucose, electrolytes, calcium, liver and kidney function tests, TSH, and a complete blood count, with additional tests such as vitamin B12, folate, homocysteine, or relevant serologies performed as indicated based on clinical history (7).

In addition to laboratory testing, Slovenian guidelines also recommend neuroimaging, particularly magnetic resonance imaging (MRI) or computed tomography (CT) (7). A non-contrast CT scan of the head is used to exclude structural abnormalities, while MRI provides a more detailed assessment of brain atrophy patterns and is particularly useful in mild or atypical presentations. Advanced imaging methods such as fluorodeoxyglucose-positron emission tomography (FDG-PET) and Single-Photon Emission Computerized Tomography (SPECT) are reserved for specialist evaluation (7). When available, MRI is preferred. Structural imaging is essential for excluding alternative or coexisting conditions such as space-occupying lesions, stroke, normal-pressure hydrocephalus, and other pathologies (15).

The aim of this study was to determine whether patients with newly diagnosed dementia underwent cognitive status assessments, and which assessment tool was used. This study also sought to determine whether patients received laboratory and imaging diagnostics, and whether they were prescribed anti-dementia medication by their family physician or referred to a clinical specialist (neurologist or psychiatrist).

MATERIALS AND METHODS

Study Type

This was a retrospective quantitative descriptive study conducted across six family medicine clinics and one half-time family and occupational, traffic, and sports medicine clinic at the Radovljica Health Center.

Subjects

The study included data from 98 patients treated between January 1, 2014 and November 23, 2018, who had a recorded diagnosis of dementia (ICD-10 codes: F00–F03, F067). Eligible patients were over 75 years of age, had a dementia diagnosis and had a registered personal physician at the Radovljica Health Center. Residents of the Janka Benedik Nursing Home, which is under the jurisdiction of the Radovljica Health Center but managed by a psychiatrist, were excluded. Patients managed by two general practitioners with concessions, those who changed their family physician during the study period, and those treated exclusively in the emergency clinic were also excluded due to a lack of accessible documentation.

Data Collection

Patient data were retrieved from the ISOZ health information system (SRC Infonet d.o.o.) using the previously-mentioned inclusion criteria and recorded ICD-10 codes of F00–F03 and F067 between January 1, 2014 and November 23, 2018. Initial and follow-up visits were included. Data collection focused on diagnostic and therapeutic management at the time of first dementia diagnosis, including whether a cognitive status assessment was performed, the assessment tool used, referrals made, diagnostic tests ordered, and whether anti-dementia medication was prescribed. For all included patients, we also reviewed permanent therapy records in the e-Prescription system, chronic conditions documented in the ISOZ program, and entries in the medical record. Collected variables included gender, age, year of diagnosis, type of cognitive status assessment (MMSE, CDT, MoCA), laboratory testing in the year of diagnosis, referrals for imaging diagnostics, referrals to psychiatry or neurology, comorbid chronic diseases, and chronic therapy.

Statistical Analysis

All data were analyzed using Microsoft Excel 16.0 (Microsoft Office 2016). A descriptive statistical method was used. The study was approved by the Slovenian National Medical Ethics Committee on 17 January 2019 (No. 0120-527/2018/12).

RESULTS

Sample Description

The documentation of 98 patients, 28.6% males (n = 28) and 71.4% females (n = 70), aged 75 to 96 years was reviewed. The exact distribution by age group is presented in Table 1.

Table 1: *Distribution of subjects by age group.*

Age	Number of patients (%)
75-80 years	29 (29.6%)
81-85 years	28 (28.6%)
86-90 years	26 (26.5%)
91+ years	15 (15.3%)

Among associated chronic conditions, arterial hypertension was the most common, affecting 81.6% of patients (n = 80), followed by hyperlipidemia in 41.8% of patients (n = 40), depression in 31.6% of patients (n = 31), heart failure in 28.6% of patients (n = 28), thrombosis and embolism in 26.5% of patients (n = 26), malignancies in 20.4% of patients (n = 20), and diabetes in 20.4% of patients (n = 20). Other notable comorbidities included benign prostatic hyperplasia in 15.3% of patients (n = 15), thyroid disease in 14.3% of patients (n = 14), atrial fibrillation in 14.3% of patients (n = 14), osteoporosis in 12.2% of patients (n = 12), and chronic kidney disease, gastroesophageal reflux, osteoporosis, and atherosclerosis of limb or neck arteries in 6.1% of patients (n = 6).

Cognitive Function Assessment

Cognitive function was formally assessed in 19.4% of patients (n = 19). Family medicine specialists most frequently used the MMSE [used in 17.3% (n = 17) of patients], while the CDT and MoCA were each used in 1.0% (n = 1) of patients. MMSE scores ranged from 7 to 27, with an average score of 20.76. The patient assessed with the MoCA achieved 24/30 points, while the patient assessed with the CDT scored 2/4 points.

Further Diagnostics and Referrals

A total of 79.6% of patients (n = 78) were referred for further management at the secondary or tertiary level. Of those, 28.6% (n = 28) were referred to psychiatry and 51.0% (n = 51) to neurology. The remaining 20.4% (n = 20) were not referred to any specialist. Imaging diagnostics were requested for 25.5% (n = 25) of patients, all of whom underwent head CT scans. No other imaging referrals were documented. In the year of diagnosis, laboratory tests were performed in 88.8% (n = 87) of patients, of whom basic laboratory tests were conducted in 65.3% (n = 64). Detailed results are presented in Table 2.

Prescription of Anti-dementia Medication at the Time of Diagnosis

Of the 98 patients included in the study, anti-dementia medication was initiated by the physician at the time of diagnosis in 9.8% of cases (n = 10). Following

Table 2: *Laboratory tests performed in the year of diagnosis.*

Laboratory tests performed	Number of patients (%)
CBC	87 (88.8%)
Creatinine, urea	78 (79.6%)
Hepatogram (bilirubin, AST, ALT, AP)	67 (68.4%)
Blood glucose	74 (75.5%)
Electrolytes (K)	72 (73.5%)
TSH	56 (57.1%)
B12 and folic acid	34 (34.7%)

referral and further management, additional patients were started on treatment. By 2018, anti-dementia therapy had been introduced in 51.0% of patients (n = 50).

DISCUSSION

Recent global analyses have highlighted trends in mortality related to Alzheimer's disease and other dementias, showing significant variation between countries and regions (16). A study conducted in the Campania region of Italy between 2015 and 2020 reported a steady increase in the incidence and prevalence of all dementias among the elderly population (17).

This study demonstrated that family physicians managing dementia patients often did not fully adhere to existing guidelines, which is consistent with findings from similar international studies (11,15). Dementia diagnoses were most frequently based on subjective reports from patients and family members, while validated cognitive assessment tools were used less often. Only ~20% of patients underwent formal cognitive testing, most commonly with the MMSE, supporting our initial hypothesis. Those results are comparable with data from Canada and Finland (10,18). Similarly, foreign studies show that MMSE is the most frequently used tool (44%), followed by the CDT (12%) and MoCA (7%) (10). A larger systematic study also confirmed that, when time constraints are not a limiting factor, the MMSE remains the most appropriate tool for primary care cognitive assessment (19). In many countries, MMSE testing is mandatory before initiating anti-dementia medication (20). It can therefore be assumed that the limited use of validated tools in our setting, as elsewhere, is largely due to time constraints (10).

Laboratory diagnostics play a central role in dementia assessment, enabling the detection of comorbidities, risk factors, and in some cases, reversible causes of cognitive decline. In this study, we examined laboratory testing at the time of dementia diagnosis to gain insight into diagnostic practices and the frequency of identifying reversible conditions. Testing was performed in most patients. Complete blood counts were most frequently performed, which is in line with guidelines and our expectations. Interestingly, vitamin B12 testing was performed more frequently than in comparable studies, although it remains unclear whether the tests were ordered by family physicians or specialists—a methodological limitation that may affect interpretation of the findings. Findings from a Finnish retrospective study of dementia and mild cognitive impairment patients found that basic blood counts were performed in 89% of patients, electrolytes were measured in 78% of patients, blood glucose in 68% of patients, TSH in 51% of patients, vitamin B12 in 20% of patients, kidney function in 68% of patients, and liver tests in 31% of patients (18). Compared with these data, family physicians in our study ordered basic laboratory investigations (kidney function, liver tests, electrolytes) somewhat less frequently (18).

Imaging diagnostics are an essential component of dementia workup as they help exclude reversible causes of cognitive decline and support more accurate dementia subtype classifications (21). Clinical guidelines, such as those issued by the UK National Institute for Health and Care Excellence (NICE), recommend structural brain imaging, MRI or CT for most patients, except in cases where the diagnosis is already clear (22).

While it may be challenging to determine which patients will benefit most from imaging, studies have shown that routine imaging can improve diagnostic accuracy and treatment planning. Thus, imaging should be considered a standard component of

dementia assessment, as it can significantly influence further clinical decisions (7,14,15). In our study, only about 25% of patients were referred for imaging, all for head CT, with no referrals for MRI. That frequency was lower than expected and below international data. The shortage of family physicians in Slovenia significantly affects the possibility of providing comprehensive patient care, and as a result, patients are often referred to secondary or tertiary levels of care before imaging diagnostics can be performed. Specialists then determine whether imaging diagnostics are necessary. Additionally, access to imaging is significantly faster when the examination is performed during hospitalization. International guidelines and the Slovenian recommendations state that imaging diagnostics should be used to exclude secondary causes (e.g., tumor, hematoma, hydrocephalus) in atypical cases (4,22).

More than half of the patients in this study were referred to clinical specialists, most often neurologists and less frequently psychiatrists. This referral rate was higher than in comparable studies abroad, which may reflect the heavy workload of family physicians in Slovenia as well as the fact that they were only authorized to prescribe anti-dementia medication beginning in 2018. Prior to 2018, the guidelines required a referral upon suspicion of cognitive decline. Since 2018, family physicians have gained the competence to initiate therapy independently; however, in our study, anti-dementia treatment was started at the primary care level in fewer than 10% of patients.

The main limitations of this study were the relatively small sample size (98 patients) and its single-center design, which limit the generalizability of the results. A limitation of our study was also the use of only descriptive statistical methods. Due to the patient selection method, individuals with undocumented dementia diagnoses may have been excluded. We also identified gaps in documentation that may have reduced data accuracy. In several cases, it was unclear whether laboratory tests were ordered directly by family physicians or by specialists. For patients diagnosed early in the calendar year, some test results from the previous year may have been included, potentially underestimating the actual frequency of testing. Similar limitations apply to cognitive testing and referrals. As data were obtained solely from medical records, it is possible that some tests or referrals were performed but not documented. Finally, the study period (2014–2018) largely predated the time when family physicians in Slovenia gained the authority to prescribe anti-dementia medications, which may have influenced the prescribing patterns. This study paves the way for future research, which should be conducted on larger, multicentre cohorts with prospective data collection.

CONCLUSIONS

Our findings highlight several challenges in dementia care at the primary level, including limited consultation time, administrative burden, lack of specialized knowledge, and incomplete documentation of procedures. To improve care quality, additional training for family medicine specialists and enhanced coordination between primary, secondary, and tertiary care are required. For better diagnostics and early disease detection, public education would play an important role and also, the establishment of dementia centers, where care would be more targeted and diagnostic procedures more accessible. Prior to referral to such a center, it would be recommended that the patient completes the MMSE test at the family physician's office.

Despite the limitations to this study, it provides a valuable foundation for future research and emphasizes the need for improving the quality of care for dementia patients in family medicine.

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