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About us

European Journal of Geriatrics and Gerontology is the official open access scientific publication organ of the Academic Association of Geriatrics. It is a double peer-reviewed journal published quarterly in April, August and December.

The target audience of the journal includes physicians working in the fields of geriatrics and gerontology and all other health professionals who are interested in these topics.

The editorial processes of the journal are shaped in accordance with the guidelines of the international organizations such as the International Council of Medical Journal Editors (ICMJE) (http://www.icmje.org) and the Committee on Publication Ethics (COPE) (http://publicationethics.org).

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Instructions to Authors

European Journal of Geriatrics and Gerontology is the official publication of Academic Association of Geriatrics. The publication language of the journal is English.

European Journal of Geriatrics and Gerontology does not charge any fee for article submission or processing. Also manuscript writers are not paid by any means for their manuscripts.

The journal should be abbreviated as "Eur J Geriatr Gerontol" when referenced.

The European Journal of Geriatrics and Gerontology accepts invited review articles, research articles, brief reports, case reports, letters to the editor, and images that are relevant to the scope of geriatrics and gerontology, on the condition that they have not been previously published elsewhere. Basic science manuscripts, such as randomized, cohort, cross-sectional, and case control studies, are given preference. All manuscripts are subject to editorial revision to ensure they conform to the style adopted by the journal. There is a double blind kind of reviewing system.

The Editorial Policies and General Guidelines for manuscript preparation specified below are based on "Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals (ICMJE Recommendations)" by the International Committee of Medical Journal Editors (2013, archived at http://www.icmje.org).

Editorial Process

Following receiving of each manuscript, a checklist is completed by the Editorial Assistant. The Editorial Assistant checks that each manuscript contains all required components and adheres to the author guidelines, after which time it will be forwarded to the Editor in Chief. Following the Editor in Chief's evaluation, each manuscript is forwarded to the Associate Editor, who in turn assigns reviewers. Generally, all manuscripts will be reviewed by at least three reviewers selected by the Associate Editor, based on their relevant expertise. Associate editor could be assigned as a reviewer along with the reviewers. After the reviewing process, all manuscripts are evaluated in the Editorial Board Meeting.

European Journal of Geriatrics and Gerontology's editor and Editorial Board members are active researchers. It is possible that they would desire to submit their manuscript to European Journal of Geriatrics and Gerontology. This may be creating a conflict of interest. These manuscripts will not be evaluated by the submitting editor(s). The review process will be managed and decisions made by editor-in-chief who will act independently. In some situation, this process will be overseen by an outside independent expert in reviewing submissions from editors.

Preparation of Manuscript

Manuscripts should be prepared according to ICMJE guidelines (http://www.icmje.org).

Original manuscripts require a structured abstract. Label each section of the structured abstract with the appropriate subheading (Objective, Materials and Methods, Results, and Conclusion). Case reports require short unstructured abstracts. Letters to the editor do not require an abstract. Research or project support should be acknowledged as a footnote on the title page.

Technical and other assistance should be provided on the title page.

Title Page

Title: The title should provide important information regarding the manuscript's content.

The title page should include the authors' names, degrees, and institutional/professional affiliations, a short title, abbreviations, keywords, financial disclosure statement, and conflict of interest statement. If a manuscript includes authors from more than one institution, each author's name should be followed by a superscript number that corresponds to their institution, which is listed separately. Please provide contact information for the corresponding author, including name, e-mail address, and telephone and fax numbers.

Running Head: The running head should not be more than 40 characters, including spaces, and should be located at the bottom of the title page.

Word Count: A word count for the manuscript, excluding abstract, acknowledgments, figure and table legends, and references, should be provided not exceed 3000 words. The word count for an abstract should be not exceed 300 words.

Conflict of Interest Statement: To prevent potential conflicts of interest from being overlooked, this statement must be included in each manuscript. In case there are conflicts of interest, every author should complete the ICMJE general declaration form, which can be obtained at: http://www.icmje.org/coi_disclosure.pdf

Abstract and Keywords: The second page should include an abstract that does not exceed 300 words. Moreover, as various electronic databases integrate only abstracts into their index, important findings should be presented in the abstract.

Abstract

Objective: The abstract should state the objective (the purpose of the study and hypothesis) and summarize the rationale for the study.

Materials and Methods: Important methods should be written respectively.

Results: Important findings and results should be provided here.

Conclusion: The study's new and important findings should be highlighted and interpreted.

Other types of manuscripts, such as case reports, reviews and others will be published according to uniform requirements. Provide at least 3 keywords below the abstract to assist indexers. Use terms from the Index Medicus Medical Subject Headings List (for randomized studies a CONSORT abstract should be provided (http://www.consort-statement.org).

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Original Articles

Original articles should have the following sections;

Introduction: The introduction should include an overview of the relevant literature presented in summary form (one page), and whatever remains interesting, unique, problematic, relevant, or unknown about the topic must be specified. The introduction should conclude with the rationale for the study, its design, and its objective(s).

Materials and Methods: Clearly describe the selection of observational or experimental participants, such as patients, laboratory animals, and controls, including inclusion and exclusion criteria and a description of the source population. Identify the methods and procedures in sufficient detail to allow other researchers to reproduce your results. Provide references to established methods (including statistical methods), provide references to brief modified methods, and provide the rationale for using them and an evaluation of their limitations. Identify all drugs and chemicals used, including generic names, doses, and routes of administration. The section should include only information that was available at the time the plan or protocol for the study was devised on STROBE (http://www.strobe-statement.org).

Statistics: Describe the statistical methods used in enough detail to enable a knowledgeable reader with access to the original data to verify the reported results. Statistically important data should be given in the text, tables and figures. Provide details about randomization, describe treatment complications, provide the number of observations, and specify all computer programs used.

Results: Present your results in logical sequence in the text, tables, and figures. Do not present all the data provided in the tables and/or figures in the text; emphasize and/or summarize only important findings, results, and observations in the text. For clinical studies provide the number of samples, cases, and controls included in the study. Discrepancies between the planned number and obtained number of participants should be explained. Comparisons, and statistically important values (i.e. p value and confidence interval) should be provided.

Discussion: This section should include a discussion of the data. New and important findings/results, and the conclusions they lead to should be emphasized. Link the conclusions with the goals of the study, but avoid unqualified statements and conclusions not completely supported by the data. Do not repeat the findings/results in detail; important findings/results should be compared with those of similar studies in the literature, along with a summarization. In other words, similarities or differences in the obtained findings/results with those previously reported should be discussed.

Study Limitations: Limitations of the study should be detailed. In addition, an evaluation of the implications of the obtained findings/results for future research should be outlined.

Conclusion: The conclusion of the study should be highlighted.

References

Cite references in the text, tables, and figures with numbers in parentheses. Number references consecutively according to the order in which they first appear in the text. Journal titles should be abbreviated according to the style used in Index Medicus (consult List of Journals Indexed in Index Medicus). Include among the references any paper accepted, but not yet published, designating the journal and followed by, in press. Authors are solely responsible for the accuracy of all references.

Examples of References:

1. List All Authors

Bonanni E, Tognoni G, Maestri M, Salvati N, Fabbrini M, Borghetti D, DiCoscio E, Choub A, Sposito R, Pagni C, Iudice A, Murri L. Sleep disturbancesin elderly subjects: an epidemiological survey in an Italian district. ActaNeurol Scand 2010;122:389-397.

2. Organization as Author

American Geriatrics Society 2015 Updated Beers Criteria Expert panel. American geriatrics society 2015 updated Beer criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015;63: 2227-2246.

3. Complete Book

Ham RJ, Sloane PD, Warshaw GA, Potter JF, Flaherty E. Ham's primary care geriatrics : a case-based approach, 6th ed. Philadelphia, Elsevier/Saunders, 2014.

4. Chapter in Book

BG Katzung. Special Aspects of Geriatric Pharmacology, In:Bertram G. Katzung,Susan B. Masters, Anthony J. Trevor (Eds). Basic and Clinical Pharmacology. 10th edition, Lange, Mc Graw Hill, USA 2007, pp 983-90.

5. Abstract

Reichenbach S, Dieppe P, Nuesch E, Williams S, Villiger PM, Juni P. Association of bone attrition with knee pain, stiffness and disability; a cross sectional study. Ann Rheum Dis 2011;70:293-8. (abstract).

6. Letter to the Editor

Rovner B. The Role of the Annals of Geriatric Medicine and Research as a Platform for Validating Smart Healthcare Devices for Older Adults. Ann Geriatr. 2017;21:215-216.

7. Supplement

Garfinkel D. The tsunami in 21st century healthcare: The age-related vicious circle of co-morbidity - multiple symptoms - over-diagnosis - over treatment - polypharmacy [abstract]. J Nutr Health Aging 2013;17(Suppl 1):224-227.

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Instructions to Authors

Case Reports

Case reports should be structured as follows:

Abstract: An unstructured abstract that summarizes the case.

Introduction: A brief introduction (recommended length: 1-2 paragraphs).

Case Presentation: This section describes the case in detail, including the initial diagnosis and outcome.

Discussion: This section should include a brief review of the relevant literature and how the presented case furthers our understanding to the disease process.

Review Articles

Reviews should include a conclusion, in which a new hypothesis or study about the subject may be posited. Do not publish methods for literature search or level of evidence. Authors who will prepare review articles should already have published research articles on the relevant subject. There should be a maximum of two authors for review articles.

Images in Geriatrics and Gerontology

Authors can submit for consideration an illustration and photos that is interesting, instructive, and visually attractive, along with a few lines of explanatory text and references. No abstract, discussion or conclusion are required but please include a brief title.

Letters to the Editor

Letters can include no more than 600 words of text, 10 references, and 1 figure or table. No abstract is required, but please include a brief title.

Invited Review Article: Invited review articles are comprehensive analyses of specifictopics in medicine, which are written upon invitation due to extensive experience and publications of authors on there view subjects. All invited review articles will also undergo peer review prior to acceptance.

Editorial Comment: Editorial comments are a briefremark on an article published in the journal by there viewer of the article or by a relevantauthority. Most comments are invited by the Editor-in-Chief but spontaneous comments are welcome. An abstract is not required with this type of manuscripts.

Tables, Graphics, Figures, and Images

Tables: Supply each table on a separate file. Number tables according to the order in which they appear in the text, and supply a brief caption for each. Give each column a short or abbreviated heading. Write explanatory statistical measures of variation, such as standard deviation or standard error of mean. Be sure that each table is cited in the text.

Figures: Figures should be professionally drawn and/or photographed. Authors should number figures according to the order in which they appear in the text. Figures include graphs, charts, photographs, and illustrations. Each figure should be accompanied by a legend that does not exceed 50 words. Use abbreviations only if they have been introduced in the text. Authors are also required to provide the level of magnification for histological slides. Explain the internal scale and identify the staining method used. Figures should be submitted as separate files, not in the text file. High-resolution image files are not preferred for initial submission as the file sizes may be too large. The total file size of the PDF for peer review should not exceed 5 MB.

Article Type	Abstract (words)	Document (words) (excluding references)	References	Total Tables and Figures
Original Articles	300	3000	50	5
Review Articles	300	3500	75	5
Invited Review Article	300	3500	75	5
Case Reports	100	1000	15	2
Images	None	500	10	2
Letters to the Editor	None	600	10	1
Editorial Comment	None	1500	20	2

Authorship

Each author should have participated sufficiently in the work to assume public responsibility for the content. Any portion of a manuscript that is critical to its main conclusions must be the responsibility of at least 1 author.

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Acknowledgments

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When reporting experiments conducted with humans indicate that the procedures were in accordance with ethical standards set forth by the committee that oversees human experimentation. Approval of research protocols by the relevant ethics committee, in accordance with international agreements (Helsinki Declaration of 1975, revised 2013 available at http://www.wma.net/e/policy/b3.html "Guide for the Care and use of Laboratory Animals" www.nap.edu/catalog/5140.html), is required for all experimental, clinical, and drug studies. Studies performed on human require ethics committee certificate including approval number. It also should be indicated in the "Materials and Methods" section. Patient names, initials, and hospital identification numbers should not be used. Manuscripts reporting the results of experimental investigations conducted with humans must state that the study protocol received institutional review board approval and that the participants provided informed consent.

Non-compliance with scientific accuracy is not in accord with scientific ethics.

Plagiarism: To re-publish whole or in part the contents of another author's publication as one's own without providing a reference. Fabrication: To publish data and findings/results that do not exist.

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4. All authors are responsible for the manuscript's content
5. All authors participated in the study concept and design, analysis and interpretation of the data, drafting or revising of the manuscript, and have approved the manuscript as submitted. In addition, all authors are required to disclose any professional affiliation, financial agreement, or other involvement with any company whose product figures prominently in the submitted manuscript.

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Instructions to Authors

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The ORCID (Open Researcher and Contributor ID) number of the correspondence author should be provided while sending the manuscript. A free registration can create at http://orcid.org.

The Review Process

Each manuscript submitted to the European Journal of Geriatrics and Gerontology is subject to an initial review by the editorial office in order to determine if it is aligned with the journal's aims and scope, and complies with essential requirements. Manuscripts sent for peer review will be assigned to one of the journal's associate editors that has expertise relevant to the manuscript's content. All manuscripts are double-blind peer reviewed. All accepted manuscripts are sent to a statistical and English language editor before publishing. Once papers have been reviewed, the reviewers' comments are sent to the Editor, who will then make a preliminary decision on the paper. At this stage, based on the feedback from reviewers, manuscripts can be accepted, rejected, or revisions can be recommended. Following initial peer-review, articles judged worthy of further consideration often require revision. Revised manuscripts generally must be received within 3 months of the date of the initial decision. Extensions must be requested from the Associate Editor at least 2 weeks before the 3-month revision deadline expires; the Journal of Urological Surgery will reject manuscripts that are not received within the 3-month revision deadline. Manuscripts with extensive revision recommendations will be sent for further review (usually by the same reviewers) upon their re-submission. When a manuscript is finally accepted for publication, the Technical Editor undertakes a final edit and a marked-up copy will be e-mailed to the corresponding author for review and to make any final adjustments.

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CONTENTS

EDITORIAL

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Let's Write About the Interference in Scientific Research on COVID-19 in Turkey: Is This Real or a Biased Dream

Gülistan Bahat Öztürk[1], Alpay Medetalibeyoğlu[2], Tufan Tükek[2], Mehmet Akif Karan[1]

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[2]İstanbul University İstanbul Faculty of Medicine, Department of Internal Medicine, İstanbul, Turkey

We have read the article by Bayram et al. (1) entitled "Interference in scientific research on Coronavirus disease-2019 (COVID-19) in Turkey" with great interest. There, the authors made may claims, i) The authors declared that tension soon started building among the public sector and medical and scientific organizations due to the Ministry of Health's lack of transparency, its reluctance to share basic data, and its refusal to collaborate. There were also concerns about the shortage of personal protective equipment (PPE) for health-care workers.

We would like to declare the situation we have been experiencing, from the beginning of this great pandemic in Turkey, from Istanbul University Istanbul Medical School which is the only university that has been declared within the first 500 ranking among the Academic Ranking of World Universities (2). We are completely free in sharing our data and suggestions with the rest of the World in order to improve the fight against the unprecedented COVID-19 pandemic. We have published two articles (3,4) which outlines the polymerase chain reaction (PCR) positive cases from our institution which has identified the first COVID-19 case in our country on March 1, 2020, and had become a major center of the pandemic in Istanbul. The other 37 articles among which we compare the data of the PCR positive and negative cases and early follow-up of more than 600 cases in our post-covid follow-up the outpatient clinic is on the way and they have all received approval from the local ethics committee and the Ministry of Health as well.

ii) Another the claim of the authors was a shortage of PPE for health-workers. This is not true in our institution. Furthermore, the Turkish Ministry of Health has supplied not only the health care workers but all of each individual in the general population with surgical masks which were given freely by the pharmacies or with free of charge delivery to the individual settings on-demand (5,6). This happened all through the country population which is more than 80 million by number. Another important point is that all patients and any exempted visitors have been recommended to absolutely bring or be given masks (e.g., non-medical or cloth masks) to wear upon entry into the health care setting for universal control (7). It has been declared that, when supplies are limited, cloth masks maybe reasonable for certain workers in health care settings.

The World Health Organization (WHO) recommends mask-wearing where there is the widespread transmission and social distancing is difficult (8,9). The WHO advises that most individuals in the community wears a non-medical mask (e.g., a cloth or fabric mask). In the United States, the centres for disease control (CDC) and prevention CDC also recommends that individuals wear a mask when in public settings or around other people who are not household contacts, particularly when social distancing is difficult to achieve (10). Noteworthy, the CDC specifies that the mask recommendation does not include medical masks, which should be reserved for health care workers (11). Considering the economical power of the United States, these approaches clearly show that there is no shortage of PPE in Turkey, which directly provides the surgical medical masks to their all citizens without any charge and without any consideration of social security insurance, being immigrant or not.

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iii) The authors claimed that "the final stroke came with the control of COVID-19 research by the Ministry of Health. Despite the great interest in research on COVID-19 in Turkey by researchers and physicians, the Turkish Ministry of Health announced a mandatory application for permission for research on COVID-19, before any application is made to ethics committees. This the unprecedented decision was against the constitution and laws regulating research activities in Turkey. It appears that most submitted projects have been approved by the Ministry of Health, but some projects, including a large, a multicentre observational study by the Turkish Thoracic Society, have been rejected without any clear explanation."

As authors noted, most of the submitted projects have been approved by the Ministry of Health. We would like to express that we had no difficulty in the approval of any projects by the Ministry. This detail for the Turkish Thoracic Society maybe, most probably, related to their own board, which proves to be very biased in their scientific conclusions. This approach is clearly against the rules of good science.

As the authors noted "the regular procedure for research activities in Turkey is well defined. In keeping with the international regulations, researchers must get approval from the independent ethics committee." This is a standard that has been applied to all researchers in Turkey. It should be noted that it is required for the researchers to be registered to clinical trials web site in many cases in order to be able to derive a good and trustable data and study. As COVID-19 is a global health concern for the country and the world, it is not surprising that the COVID studies should receive permission from the Ministry of health. This approach could only be appreciated as the scientists that aim to derive good data and trustable, ethical studies. Furthermore, the Minister of Health, who has been directing this health crisis with great success from the beginning of the pandemic, called Turkish scientists to publish their data as soon as possible, publicly.

The authors did not write anything about the successful management of COVID-19 health demand in Turkey. We had no shortage of hospital beds, no shortage of intensive care unit beds. These health services have been supplied to every single individual that reside in Turkey, who may be immigrant even with no identity number. We had no deaths due to a shortage of medical care. This point has been appreciated many times (12).

Another point is that the Turkish Thoracic Society has been well criticized by their such biased declaration by the respiratory physicians themselves. It would be expected by the board members of the society to yield a general view from the respiratory physicians, as they owe this to the scientific committee they claim that they already represent. In fact, such a declaration without any survey among respiratory physicians is another major fault of the society.

In conclusion, we, as Istanbul University Istanbul Medical Faculty, are greatly worried and concerned about the biased approach of the few members of the Turkish Thoracic Society that fails to represent the respiratory physicians.

Ethics

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Concept: G.B.Ö., M.A.K., Design: G.B.Ö., T.T., Data Collection or Processing: G.B.Ö., A.M., Analysis or Interpretation: T.T., Literature Search: G.B.Ö., A.M., Writing: G.B.Ö., A.M., M.A.K.

Conflict of Interest: No conflict of interest was declared by the authors.

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ORIGINAL RESEARCH

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Epidemiology of Adrenal Insufficiency Among Elderly Patients in a Convalescent Care Unit and One Year Outcome

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Abstract

Objective: Adrenal insufficiency (AI) is associated with significant morbidity and mortality. The diagnosis of AI in elderly people is difficult with its non-specific presentation. The aim of this study is to describe the epidemiology, pattern of comorbidity and one-year outcome among elderly people after their initial diagnosis of AI.

Materials and Methods: Patients aged >65 years, who underwent the Short Synacthen test (SST) done during the period of 1.1.2014 to 30.6.2019, were retrieved. Basic demographic information, comorbidities as measured by the Charlson Comorbidity index (CCI), cause for admission, length of stay, one year unplanned readmission and death were recorded.

Results: Two hundred forty two patients with the mean age of 79.6 (standard deviation 8.75) were identified. The causes for admission were pneumonia (22.3%), electrolytes abnormalities (11.6%) urinary tract infection (UTI) (8.6%) and poor oral feeding (7.8%). Ninety four (38.3%) were diagnosed to have AI. The most common indication for SST was electrolytes abnormalities. Unplanned readmission was present in 52.7% of patients. Inpatient mortality was 11.6% and one year mortality was 44.8%. There was no statistically significant difference between the AI and normal response group in age, gender, CCI score, length of stay, cause for admission, indication for SST and mortality. However, the AI group had a much lower baseline cortisol level (389 nmol/L vs. 192.4 nmol/L, p<0.001).

Conclusion: This unrecognized group of elderly AI patients presents non-specifically. Respiratory and UTIs were the most common cause of admission. Physicians should be more alert on this easily unrecognized problem in the elderly. What is known on the subject and what does the study add: The incidence of AI in elderly subjects is on the rising trend, yet, it is easily unrecognized; this study highlights the importance of infection that contributes to AI development and the non-specific presentation of this disease in older population.

Keywords: Adrenal insufficiency, elderly, epidemiology

Introduction

Adrenal insufficiency (AI) is an uncommon problem, but it can be associated with significant morbidity and mortality (1). Causes of AI can be primary or secondary. Primary AI is due to inadequate production of adrenocorticosteroids as a result of damage to the adrenal gland. Common etiologies include autoimmune disease, infection, tumour or hemorrhage. Secondary AI is far more common than primary AI (2,3). It is due to disease in the pituitary or hypothalamus, causing inadequate adrenocorticotropic hormone production, which in turn reduces stimulation to adrenal cortex on corticosteroid production. Surveys in the Western population revealed that the prevalence of primary and secondary AI increased with time. The reported prevalence rate of primary and secondary AI in the 1990s was 9-14/10^5 and 15-28/10^5 population respectively (2,4) which was much higher than those reported in the 1960s. However, a Japanese study has observed that the incidences of primary

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AI decreased with time (5). On the contrary, a nationwide Taiwanese study showed that the annual incidence of AI had continuously increased and elderly patients were accounted for the majority of this increase (6).

The diagnosis of AI is non-specific. It usually presented with variable symptoms such as fatigue, fever, poor appetite or gastrointestinal discomfort. It can progress to adrenal crisis with electrolytes disturbances, change of conscious level, shock and even death. Making the diagnosis of AI in older people is even more difficult. Older people have multiple comorbidities, and the symptoms might be mistaken as ageing processes (7). Epidemiological studies about AI among the elderly population are limited. Contributing factors and the signs and symptoms of AI are not well studied. Prevention of an adrenal crisis requires early recognition and prompt initiation of treatment. However, not much data are available on the incidence and prevalence of AI, and the low awareness among medical professionals may lead to adverse outcome in an unrecognized adrenal crisis.

This study aims to describe the demographic profile, the pattern of comorbidity, contributing factors for older adults with AI and the 1-year outcome after the diagnosis of AI.

Materials and Methods

Hospital records were retrieved from 3 extended care units of a hospital network in Hong Kong. Case notes of subjects with age >65 and with Short Synacthen test (SST) done during the period 1.1.2014 to 30.6.2019 were retrieved. Those who were admitted as day-procedure for SST were excluded. Patient's age, gender, place of residence, comorbidities measured by Charlson Comorbidity index (CCI) (8) on admission, principal diagnosis and length of stay were recorded. An infection was classified as principal diagnosis or secondary diagnosis based on the condition that the disease was caused by an organism such as urinary tract infection (UTI), pneumonia or lower respiratory tract infection (LRTI) or where an infectious agent was coded (9). A virus was identified as present when specific viral agent was identified or where a diagnostic code had a viral agent included (9). Gastroenteritis was recorded by any code that specifies gastroenteritis whether it can be viral, bacterial or non-infectious in origin. Pneumonia/LRTI/chest infection was classified as pneumonia. Acute bronchitis and chronic obstructive pulmonary disease (COPD) with mentioning of infection were also considered as chest infection. In contrast, COPD, asthmatic exacerbation or bronchiectasis where the infection was not mentioned were not considered as infection.

Baseline cortisol level were recorded. AI is diagnosed by SST. For standard dose SST using 250 mcg tetracosactin, a failure of the cortisol level taken at 30 min to rise >550 nmol/L from baseline is considered as positive (10). For low dose SST using one mcg of tetracosactin, a failure of 30 min cortisol to rise >400 nmol/L from baseline is considered as positive (11). Indication for SST were be recorded. These include hypotension, electrolytes abnormality, unexplained poor general status, poor appetite, weight loss and other indications were collected. All subjects will be further followed for one year after their diagnosis. The proportion of patients with unplanned hospital readmission will be calculated. The discharge diagnosis and death were analyzed.

Subjects who failed the SST were considered as cases while those showed a normal response were considered as the control group.

Statistics

Descriptive statistics on baseline demographic variables as mean +/- standard deviation (SD) or median where appropriate. Between-groups comparison on demographic variables, possible precipitating causes, length of stay and inpatient mortality will be analyzed by t-test or Mann-Whitney U test for continuous data and x^2 test for categorical data. Hospital readmission rate and mortality at one year were also compared. A p-value of <0.05 is considered as statistically significant.

This study is approved by the Hong Kong Hospital Authority Cluster Hospital Research Ethics Committee.

Results

There were a total of 292 SST done during the period of 1.1.2014 to 30.6.2019. Among them, 242 subjects met the inclusion criteria, and their records were retrieved. Figure 1 shows the consort flow diagram. The mean age was 79.6 (SD 8.75). There were 135 male subjects (55.6%). One hundred seventy one low dose SST and 72 standard dose SST were performed. The most common cause for hospitalization was pneumonia (54, 22.3%) followed by electrolytes abnormalities (28, 11.6%), UTI (21, 8.6%) and poor oral feeding (19, 7.8%). There were 28 subjects died during the index admission. The in-patient mortality rate on the index admission was 11.6%. During the one-year observation period after discharge from the index hospital admission, 152 subjects were readmitted with a median number of readmission of 2,96 of them were dead in one year and the one year mortality rate was 44.8%. Indications for SST was shown in Figure 2. One hundred fourty eight (61.15%) of them have a normal response to SST while 94 were diagnosed as AI (38.84%). There was no statistically significant difference between the two groups on age, CCI, causes for hospitalization and indications for SST. For electrolytes abnormalities, all of them were due to hyponatremia. There was also no statistical significant difference in hospital length of stay, inpatient and one year mortality between those who have normal and failed response to SST. However, the adrenal insufficient group has a much lower baseline cortisol level than the normal response

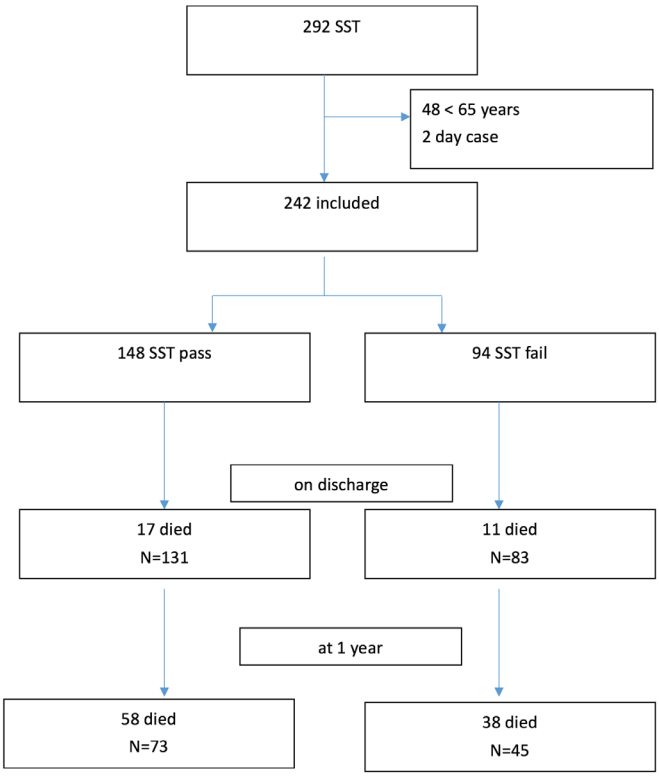

Figure 1. Consort flow diagram

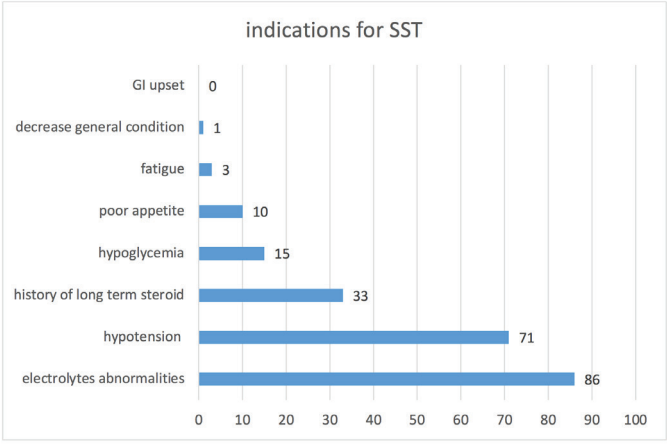

Figure 2. Indications for SST among the whole sample group each bar represents number of case

SST: Short Synacthen test, GI: Gastrointestinal

group (Table 1).

Discussion

There were many causes for AI. Many studies have reported on primary and secondary causes of AI, mostly related to brain tumour. Primary AI is rare with an estimated incidence of 0.56-0.62/10^5 (4), while for secondary AI, no definite data on the incidence rate is available (12). A study in Taiwan (6) reported an increasing incidence of all-cause AI over a 13-year period of 6.4 to 15.2/10^5. This can be attributed by an ageing population, increasing incidence of underlying diseases that lead to AI and perhaps, better diagnostic ability. The peak age for primary AI is reported to be around 40s while for secondary AI, it was at the 6th decade of life (2). In our study, the mean age for all causes of AI is around 80, which is much older than those reported previously (2). In spite of this, it seems that AI in Asian/Chinese ethnicity is more common among the older age group. The proportion of subjects with AI with age >80 is on the rising trend as reported in a nationwide survey (6). The incidence rate was 10.6% in 1997, rising to more than twofold to 27% in 2008. In echo with this, it is suggested that the growing number of AI in the elderly population may be due to an increase in the incidence of disease that precipitates adrenal failure. Moreover, older people have a lower sensitivity of the hypothalamus-pituitary-adrenal axis (HPA) to cortisol feedback (13) which might explain the higher incidence of AI among them. For secondary AI, sudden discontinuation of exogenous glucocorticoid therapy or hypothalamic-pituitary-adrenal axis suppression due to long term steroid use and inadequate cortisol production in response to physiological stress is common among elderly patients with long term steroid use due to COPD or arthritic conditions (14).

This study reveals the non-specific presentation of AI. Most cases of AI were diagnosed in an acute hospital setting in which the classical signs and symptoms of AI such as hypotension, hypoglycemia, hyponatremia will be presented to an acute hospital for urgent medical treatment. Those cases that managed in extended care and rehabilitation units were usually more stable with limited symptoms that seldom arouse awareness on the possibility of adrenal problem. In spite of this, we were still able to detect a certain proportion of patients who were undiagnosed. We postulated that this underdiagnoses of AI might be due to lack of unawareness or the non-specific presentation of AI in older adults.

Our findings showed that pneumonia was the most common cause for acute hospital admission in subjects with newly diagnosed AI. Bacterial infection will impact subjects with AI. Studies have shown that patients with hypoadrenalism have a higher risk of bacterial infection (15,16). Furthermore, the presence of a bacterial infection will provoke a strong inflammatory cytokine response that stimulates the HPA to increase cortisol production. This can lead to a reduction in inflammation and protect against tissue damage. However, in the case of hypoadrenalism, the lack of an increase in cortisol production will lead to a severe inflammatory response which may result in tissue damage and systemic effects including hypotension, shock and organ failure (17). A study in Japan (18) showed that infectious disease was the major cause for inducing adrenal crisis. Another study (19) supported the finding of a close relationship between the severity of community-acquired pneumonia, inpatient mortality and the average

Table 1. Characteristics of patients undergoing Short Synacthen test

	SST pass (N=148)	SST fail (N=94)	p
Age (years)	79.43 (SD 9.17)	79.61 (SD 8.75)	0.706
CCI (median)	2	2	0.742
Gender (male)	82 (57.77%)	52 (55.32%)	1
Old age home residents	36 (24.32%)	25 (26.6%)	0.762
Length of hospitalization (days)	38.68 (SD 64.77)	31.39 (SD 46.45)	0.345
Unplanned readmission	91 (64.48%)	61 (65.59%)	0.584
In patient mortality	17 (11.4%)	11 (11.7%)	1
One year mortality	58 (44.2%)	38 (45.7%)	0.892
Baseline cortisol level (nmol/L)	389.89 (SD 143.56)	192.41 (SD 130.67)	<0.001 (95% CI -233.15, 161.81)
Indications for SST			
Hypotension	49 (33.1%)	21 (22.3%)	0.082
Electrolytes abnormalities	56 (37.83%)	30 (31.9%)	0.409
Fatigue	1 (0.6%)	2 (2.1%)	0.335
Poor appetite	6 (4.1%)	9 (9.6%)	0.591
Hypoglycemia	7 (4.7%)	8 (8.5%)	0.278
History of long term steroid	15 (10.1%)	18 (19.1%)	0.055
Decrease general condition	8 (5.4%)	8 (8.5%)	0.428

SST: Short Synacthen test, CCI: Charlson Comorbidity index, SD: Standard deviation

length of hospitalization with adrenal function. A recent study reported that infection was the most prevalent comorbidity for adrenal crisis among adrenal insufficient subjects, followed by respiratory disease (20). There are many risk factors for adrenal crisis among subjects with chronic AI. It is well reported that initial illness, especially sepsis, was associated with AI (21). From our study, there were a number of patients who were newly diagnosed as having AI only after they were transferred to convalescence unit. This reiterated the fact that presentation of AI is very vague and easily missed. This group of patients may have more comorbidities and may be much older in age. The altered HPA function in older people would have an influence on the onset of adrenal crisis (22). Therefore, adrenal failure thus developed would lead to a more severe condition than the younger population and higher incidence as well. A population survey found that excluding those with chronic AI, patients with the adrenal crisis were older and had more comorbidities than those with primary and central AI (23). Thus, physicians caring for patients with AI, besides attention on the general status and predisposing conditions, the patient's age and comorbidities should also be taken into account.

The most common indication for performing SST in our sample population was electrolytes abnormalities. This is one of the alerting sign for the diagnosis of AI (24). AI is not a common cause for hyponatremia (25). However, it has been described that a low serum sodium level is present in 80% of cases with adrenal crisis (26). In contrast, a more recent study (6) showed that among 4.85% of patients with newly diagnosed AI has electrolytes imbalance. The author postulated that the severity of AI in their population group does not reach the level of adrenal crisis. This is in accordance with the setting of non-acute convalescence unit diagnosing AI. Those patients with a borderline adrenal reserve will have subtle signs and symptoms that would have been detected in convalescence in which the longer length of hospital stay would enable clinicians to have a thorough investigation of non-specific presentations. Thus a high index of suspicion should help to alert clinicians on the diagnosis of AI.

The second most common indication for performing SST is unexplained hypotension. Those with very low blood pressure or even shock would have been detected during an adrenal crisis. Those frail elderly patients with relatively low blood pressure, but asymptomatic, would have been missed. Clinicians managing patients with asymptomatic hypotension may consider this low blood pressure was due to dehydration, occult sepsis or side effects of drugs. These diagnostic uncertainties may differ between clinicians with varying level of experience. Both hypotension and electrolytes imbalance was only present in 22-31% of our subjects. This low prevalence of the classical signs and symptoms of AI warrant thorough evaluation of elderly patients with non-specific signs and symptoms. Patients with chronic AI may present non-specifically and only when exposed to medical conditions such as infection will result in adrenal crisis and mortality.

Inpatient and one year mortality were high in our study population. 11.6% of our sample died during the index hospitalization while the one year mortality was up to 40%. This reflects the severity of medical problems and the poor health status of our study sample. However, our study showed

that the one year mortality rate were similar between subjects with or without AI. This could represent the effectiveness of the replacement therapy. As such, offering more screening in suspected patients may benefit more patients with undiagnosed AI.

Furthermore, it is postulated that those underdiagnosed hypoadrenal patients would have their medical illness treated in acute hospital and discharge back home directly. There is a possibility that they will develop adrenal crisis after another episode of medical illness. They are a group of vulnerable patients with potentially lethal outcome. It is suggested that those frail elderly with a low or borderline electrolytes abnormalities and/or unexplained low blood pressure should have screening for AI.

Management of AI is practically difficult in older patients. The pharmacokinetics and pharmacodynamics of drugs change with age. Polypharmacy, which is common in the elderly population, complicate drug-drug interaction. Cognitively impaired elderly patients will have compliance issues (27), and the increasing prevalence of comorbid conditions with ageing will further influence the disease management. Typical signs and symptoms of infection such as fever may not be experienced by elderly patients. Thus, the stress dose of glucocorticoid may not be administered. Furthermore, delirium is common among elderly with sepsis, self-management of taking extra steroid dose will not be possible.

There were several limitations in our study. Only database on SST was retrieved. We cannot identify the true incidence of AI among subjects in the convalescence care unit. We could not differentiate primary from secondary AI, although the management for both causes of AI remains the same. The severity of AI cannot be adequately assessed. We only have data on the baseline cortisol and electrolytes level. There was no information on the clinical state of the subjects nor the blood pressure response. Details on drug prescription were not recorded. The cause for hospital readmission were not known. The incidence of AI may be under-estimated since those cases that were diagnosed and treated in ambulatory setting were not included. There was no information on the infectious agent causing the sepsis.

Finally, we cannot ascertain the cause and effect on the relationship between AI and as it was only a retrospective study.

Conclusion

A certain proportion of elderly people with AI were unrecognized in acute hospital and present non-specifically. Infection of the chest and urinary tract were the most common comorbidity. Hypotension was the most common manifestation of AI among convalescence care elderly patients. Clinicians should be more aware of the signs and symptoms of AI, which is easily overlooked in the elderly population.

Ethics

Ethics Committee Approval: This study is approved by the Hong Kong Hospital Authority Cluster Hospital Research Ethics Committee (date: 18.12.2019, number: KC/KE- 19-0218/ER-2).

Informed Consent: Since this is a retrospective study, no patient consent is required.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Concept: D.K.Y.M., Design: D.K.Y.M., Data Collection or Processing: D.K.Y.M., S.P.M., S.K.F.T., Analysis or Interpretation: D.K.Y.M., Literature Search: D.K.Y.M., Writing: D.K.Y.M., S.P.M., S.K.F.T.

Conflict of Interest: No conflict of interest was declared by the authors.

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ORIGINAL RESEARCH

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Association Between Dementia and Common Geriatric Syndromes

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Abstract

Objective: Dementia is a neurodegenerative disease characterized by a decline in cognition involving one or more cognitive domains (learning and memory, language, executive function, complex attention, perceptual-motor, social cognition). We aimed to assess the relationship of dementia with falls, urinary incontinence, polypharmacy, malnutrition, frailty and sleep disorders.

Materials and Methods: Two hundred and five individuals with the diagnosis of dementia and with no signs of dementia, who attended Istanbul University Faculty of Medicine geriatrics outpatient clinic, were retrospectively evaluated. Univariate and multivariate regression analyses were performed to investigate the association between dementia and other Geriatric syndromes.

Results: The mean age was 77.9±6.47 years and 72.7% of the patients were female and 27.3% were male. The prevalence of dementia was 39.5% (n=81). In univariate analysis, dementia was found to be associated with malnutrition (p=0.024), sleep disorders (p=0.032), falls (p=0.001), frailty (p=0.037), male gender (p=0.001) and polypharmacy (p=0.001). In multivariate analysis, dementia was found to be independently associated with malnutrition (p=0.028, odds ratio=5.106, 95% confidence interval=1.189-21.932) and male gender (p=0.001, odds ratio=3.407, 95% confidence interval=1.786-6.500).

Conclusion: In our study, it was found that malnutrition and male gender were independently associated with dementia. Patients with neurodegenerative diseases are at risk of malnutrition, while reduced food intake is associated with disease symptoms. Geriatric syndromes increase mortality and morbidity in dementia patients. Therefore, clinicians should be aware of Geriatric syndromes in dementia patients.

Keywords: Dementia, malnutrition, urinary incontinence, falls, frailty

Introduction

Dementia is a neuropsychiatric syndrome characterized by cognitive decline and progressive deterioration of daily function, often associated with behavioral disturbances. Neurological disorders are now responsible for the largest number of disability-adjusted life years (a combined index of early mortality and years spent in disability). They now account for 10% of the global burden of disease. The prevalence of dementia in older participants is reported to be nearly 6% worldwide (1). It is probable that dementia is being underestimated, since in some parts of the world, patients with dementia never come to clinical attention. Dementia being considered as an inevitable consequence of aging (2) and, with global population ageing, it is expected to rise, although some recent studies have suggested declining trends in dementia frequency (3).

Dementia is any disorder where significant decline from one's previous level of cognition causes interference in occupational, domestic, or social functioning. Generally, dementia should be considered to be an acquired syndrome, with multiple possible causes, rather than a specific disease itself. For example, the dementia syndrome of progressive decline in language can be caused by various diseases, such as Alzheimer's disease (AD), a tumor in the language cortex, or frontotemporal lobar degeneration. Global estimates of dementia prevalence are up to 7% of individuals above the age of 65, with a slightly higher prevalence (8-10%) in developed countries due to longer life spans (1).

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AD is the most common form of dementia in older people, accounting for 60% of cases. Numbers likely to increase given our ageing population. There are lots of concomitant problems progressing with dementia, like polypharmacy, malnutrition, sleep disorders, frailty, falls etc. Polypharmacy, the co-prescription of multiple drugs, is common and a particular concern amongst patients with dementia (4,5).

According to the World Alzheimer Report 2018, about 50 million people worldwide lived with dementia in 2018, with the number projected to increase to 152 million by 2050 (6).

There are extensive range of risk factors associated with dementia such as smoking, alcohol abuse, and other non-communicable diseases like diabetes mellitus, hypertension, hypercholesterolemia, metabolic syndrome, obesity which are listed as cardiometabolic risk factors and atrial fibrillation, chronic kidney disease etc. The risk of having dementia increased in older groups especially from the age of 65 or above (7).

Turkish Statistical Institute shows that life expectancy keeps growing in Turkey. So, we have to be prepared the problems of aging like dementia as well. This may lead to excessive health care cost in government budget. There is obvious relationship between dementia and other geriatric syndromes. If we know the association between them, we can avoid complications such as fall related fractures, malnutrition related prolonged hospitalization, incontinence related urinary infections etc. In that way increased living comfort level, reduced number of hospitalization, lowered number of medication usage for the patient to be sustained. The aim of the study to assess the relationship between dementia and falls, urinary incontinence (UI), polypharmacy, malnutrition, frailty and sleep disorders in our population.

Materials and Methods

Study participants were recruited among older adults ≥65 years of age admitted to Istanbul University Faculty of Medicine, Department of Geriatrics outpatient clinic for the first time between a period of September 2015- August 2016 were evaluated retrospectively. Between study participants there were patients who have been medically diagnosed with dementia or showing signs and symptoms of dementia. Patients were evaluated retrospectively by a geriatrician using the patients' records on admission. Patients' data about number of chronic diseases and prescribed drugs; falls (in the preceding year); the presence of UI, frailty; nutritional status; sleep disorders; and dementia were noted. Dementia was diagnosed according to diagnostic and statistical manual of mental disorders, fifth edition criteria. UI was defined as "a complaint of any involuntary leakage of urine in the past 12 months" (8). Nutritional status was assessed by Mini Nutritional Assessment short form, which indicates the presence of malnutrition, malnutrition risk, and normal nutritional state when the score is 0-7 points, 8-11 points, and >11 points, respectively (9). Polypharmacy was defined as the daily use of five or more medications (10). Frailty was assessed by The International Association of Nutrition and Aging's FRAIL scale which includes five components; fatigue, resistance, ambulation, illness and loss of weight. FRAIL scale scores range 0-5; ≥3 represents frail, 1-2 pre-frail and zero for robust health status (11). In our study FRAIL score ≥3 was accepted frail and scores <3 non-frail. Sleep disorders components are insomnia and restless leg syndrome (RLS). Insomnia was assessed by asking the patients if they have experienced any difficulty in falling sleep and/or maintaining sleep (12). For evaluating RLS a single question was asked; do you experience unpleasant and restless feeling in your legs which is relieved by walking or movement (13). The study protocol has been evaluated and approved by Istanbul University Faculty of Medicine Ethics Committee (decision no: 90562, date: 05.06.2020). Informed consent was obtained from all the patients.

Statistics

The variables were assessed in terms of the normality of their distribution using the Kolmogorov-Smirnov test. Numerical variables with normal distribution were presented as mean ± standard deviation and those with skewed distribution were presented as median (minimum-maximum). Categorical variables were shown as frequencies. For comparison of two groups, we used independent sample t-test or Mann-Whitney U test where appropriate. Chi-square test and Fisher's Exact test were used for comparison of non-numerical data. P values less than 0.05 were accepted as statistically significant. Binary logistic regression models were used to investigate the association between variables. The factors found significantly associated with dementia in univariate analysis were further evaluated by logistic regression analysis. The IBM SPSS for Windows, version 22.0 (IBM Corp., Armonk, NY, USA) was used for statistical analysis.

Results

Among a total of 1.034 patients, 205 participants aged ≥65 were included in this study. The sample was composed of women 149 (72.7%) and men 56 (27.3%). Mean age was 77.9±6.47 years. Eighty-one patients (39.5%) have a diagnosis of dementia. One hundred and eighty-eight (88.3%) patients reported at least one fall in the previous year and 101 (48.8%) patients have one of the sleep disorders. The frequency of UI is 58%. 6.3% of the patients have malnutrition.

The characteristics of the study population including the age, number of drugs, dementia, nutritional status, UI, falls, and frailty are given in Table 1.

Univariate Analysis for the Association of Geriatric Syndromes and Dementia

In univariate analysis dementia was not associated with UI (p=0.149). In the other hand, dementia was found associated with malnutrition (p=0.024), sleep disorders (p=0.032), falls (p=0.001), frailty (p=0.037), male gender (p=0.001) and polypharmacy (p=0.001) (Table 2).

Multivariate Analysis for the Association of Geriatric Syndromes and Dementia

Regression analysis was performed to find independent factors associated factors with dementia. Dementia was our dependent variable, and the independent variables were falls, sleep disorders, malnutrition, polypharmacy, frailty and male gender. A statistically significant relationship was found between malnutrition [p=0.028, odds ratio (OR)=5.106, 95% confidence interval (CI)=1.189-21.932] and male gender (p=0.001, OR=3.407, 95% CI=1.786-6.500) (Table 3) in regression analysis.

Discussion

As the population ages worldwide, the overall burden of dementia is increasing simultaneously. Dementia may have more than one cause, particularly as the condition progresses and especially in older people. In addition, medical illnesses, comorbidities also some medications exacerbating poor cognition are common in older adult patients with dementia. Globally, an estimated 47 million people are affected by dementia (14).

AD is the most common cause of dementia from middle age to the elderly and has a prevalence of 5-6% of all individuals age 65 and above, and up to 30% in those over age 85 (15). In our study the frequency of dementia is 39.5%. Our study population consist mainly from old subjects. Mean age was 77.9±6.47 years. Therefore, our dementia prevalence is in accordance with the literature. In a Turkish study the prevalence of dementia was found 21.6% (16). This may be due to the presence of more advanced and older patients.

Advanced age and gender, two of the most prominent risk factors for dementia. Lifestyle factors such as smoking, excessive alcohol use and poor diet modulate sensitivity to dementia in both males and females. Depending on the subtype of dementia, the ratio of male to female prevalence differs. Females are at greater risk of developing AD dementia, whereas males are at greater risk of developing vascular dementia or Parkinson disease dementia. Data from the Framingham study, which enrolled a total of 2.611 cognitively intact participants (1.550 women and 1.061 men) and followed-up on many for 20 years, indicated that for a 65-year-old man, remaining lifetime risk of AD was 6.3% (95% CI, 3.9 to 8.7) and remaining lifetime risk of developing any dementing illness was 10.9% (95% CI, 8 to 13.8); corresponding risks for a 65-year-old woman were 12% (95% CI, 9.2 to 14.8) and 19% (95% CI, 17.2 to 22.5), almost twice that of men (17). This can be particularly valid for subjects over the age of 85 years, due to differences in life expectancy.

Table 1. General demographic data and geriatric syndrome data of the study population

Male	56 (27.3%)
Female	149 (72.7%)
Age (years)	77.9±6.47
Dementia	81 (39.5%)
Malnutrition	13 (6.3%)
Frailty	68 (33.2%)
Polypharmacy	183 (89.3%)
Falls	181 (88.3%)
Sleep disorders	100 (48.8%)
Urinary incontinence	119 (58%)

Table 3. Logistic regression analysis for factors associated with dementia

Factor	p	Odds ratio	95% confidence interval
Malnutrition	0.028	5.106	1.189-21.932
Male gender	0.001	3.407	1.786-6.500

Dependent variable was the presence of dementia; independent variables were female gender and malnutrition (Factors included in the multivariate analysis are sleep disorders, falls, frailty, polypharmacy, malnutrition and male gender)

Table 2. Univariate analysis for dementia and related factors

Variables	Total	Dementia (+)	Dementia (-)	p
Male gender [n, (%)]	56 (27.3%)	34 (60.8%)	22 (39.2%)	p<0.01*
Age (years)	77.9±6.47	78.7±6.6	77.3±6.3	p=0.45
Malnutrition [n, (%)]	13 (100%)	9 (69.2%)	4 (30.8%)	p=0.024*
Falls [n, (%)]	181 (100%)	57 (31.5%)	124 (68.5%)	p<0.01*
Frailty [n, (%)]	68 (100%)	20 (29.4%)	48 (70.6%)	p=0.037*
Urinary incontinence [n, (%)]	119 (100%)	52 (43.7%)	67 (56.3%)	p=0.149
Sleep disorders [n, (%)]	100 (100%)	32 (32%)	68 (68%)	p=0.032*
Polypharmacy [n, (%)]	183 (100%)	59 (32.2%)	124 (57.8%)	p<0.01*

n: Number, *: Statistically significant

On the other hand, ın our study male gender is highly associated with dementia (p=0.001). We know that men with a Lewy body dementia and Parkinson disease dementia have a higher incidence of dementia than women across the age spectrum.

It is common for Alzheimer pathology to coexist with other processes, including vascular lesions, cortical Lewy bodies, argyrophilic grain disease, and Parkinson disease. The combination of two pathologies could influence the clinical presentation and course of the disease and present diagnostic challenges (18). The most common combination is that of AD and vascular dementia. Mixed dementia is more common in males than females (19) and also in older age groups, such as those over 75 years. Although we do not know the dementia subtype of our patients, if we consider that the mean age of our patient population is high, we can interpret that the results are compatible.

We have found the malnutrition frequency is 6.3%. In a study which was conducted in Japan, the prevalence of those with malnutrition in early-stage AD 8.2% and were higher among those with early-stage AD and the people who have normal cognition (p<0.001) (20). In another Turkish prevalence study, the malnutrition prevalence is 9.6% (16). So, our results were also similar with the literature. In our study we found a significant relationship between malnutrition and dementia in both univariate analysis and bivariate analysis (p=0.024, p=0.028). Inadequate nutrition is very common in patients with dementia and is associated with increased mortality (21). Decreased sense of smell is also common in dementia patients and can exhibit itself as weight loss and poor appetite. As a result, malnutrition develops in dementia patients. A few studies recently reported that nutritional problems, which are likely appetite changes, weight loss, and sarcopenia, start with mild cognitive impairment and early-stage AD (22-25). There is no need for advanced dementia.

In our study the frequency of frailty was 33.2%. Frailty is a common geriatric syndrome. Frailty is defined as a clinical state in which there is an increase in an individual's vulnerability to developing negative health-related events (including disability, hospitalizations, institutionalizations, and death) when exposed to endogenous or exogenous stressors (26). In most studies' frailty prevalence was 3.5%-27.5% (27). Frailty prevalence varies according to tool used. Also, we found a relationship between frailty and dementia in univariate analysis. Dementia is a progressive, debilitating disease which affects approximately half the residents in aged care impacting significantly on their care needs. Due to the inherent cognitive and physical decline over time, residents become increasingly dependent on care from others. Therefore, our frailty prevalence is close to upper limit. Also, we can explain the relationship between frailty and dementia by this.

Other important issue in the geriatric group is a number of a medication. Optimizing drug therapy is an important goal of caring for the older adult population. Polypharmacy is defined as the use of multiple medications and generally ranges from five to ten medications (10). Polypharmacy has been independently associated with an increased risk for an adverse drug event, and increased risk of hospital admission and length of stay (28). In our study the frequency of polypharmacy was 89.3%. And we found a relationship between dementia and polypharmacy (p<0.01). Also, we found a relationship between dementia and sleep disorders (p=0.032). Vascular risk factors have been linked to increased risk of cognitive decline and dementia. These risk factors are diabetes mellitus, hypercholesterolemia, hypertension, metabolic syndrome and obesity. Therefore, the comorbidities of dementia patients are quite much and the number of drugs they use has increased. Our study population is older. The number of comorbidities of the patients with whose comorbidity data we had access to was high. On the other hand, sleep disorders and disturbances are common complaints among patients with dementia. Multiple factors contribute to sleep impairment in this population. Such as; age and dementia related changes in sleep and circadian rhythms, primary sleep disorders, comorbid illnesses and medications (29). Hypnotic use or sedating medication has also increased due to the frequent occurrence of sleep disorders in dementia patients, and this causes an increase in the number of drugs used by patients.

UI is more common in the elderly populations with dementia than without dementia. UI may complicate dementia morbidity and mortality. In our population UI frequency is 58%. In most of the studies prevalence rates over 50 percent have been reported (30). In a Turkish study the prevalence of UI was found 47.6% (16). As a result, rates are at quite similar. We couldn't find a relationship between UI and dementia (p=0.149). This is a surprising result. Although UI is a critical symptom and prevalent concomitant in patients with dementia, study about the association between UI and dementia is rare maybe because of the difficult assessment of UI in patients with severe cognitive and physical deterioration. This result may be due to the low number of dementia patients.

Study Limitations

There are a number of limitations in this study. The sample size was not very large and especially we had few patients with dementia. This is a retrospective population-based study, so we did not have objective data including questionnaire, Dementia rating scale such as mini mental state examination. Therefore, the data did not provide information on stage and severity of dementia. Besides, we did not separate and analyze patients with dementia according to dementia subtype. This situation may affect the results. On the other hand, there are few studies

evaluating the prevalence of dementia and possible related factors among community-dwelling older persons in Eastern Europe. Our study is one of the few studies in this area.

Conclusion

In our study we found high frequency of dementia among older adults in Turkey as much as 39.5%. And dementia was highly associated with male gender and malnutrition. We have suggested the importance of screening other geriatric syndromes in dementia patients. It's known that, morbidity and mortality tend to increase due to these concomitant geriatric syndromes in dementia patients. If we screen specifically for these syndromes, we can prevent them faster. Therefore, more attention shall be paid to screening activities.

Ethics

Ethics Committee Approval: The study protocol has been evaluated and approved by Istanbul University Faculty of Medicine Ethics Committee (decision no: 90562, date: 05.06.2020).

Informed Consent: Informed consent was obtained from all the patients.

Peer-review: Internally peer-reviewed.

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ORIGINAL RESEARCH

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Medication Adherence and Related Factors in Elderly Patients

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Abstract

Objective: The present study investigates medication adherence, motivation, and knowledge level in the elderly who are on chronic medication as well as adherence-related factors.

Materials and Methods: The study included 316 patients aged 60 years and above who were admitted to the family medicine outpatient clinic and who had been on chronic medication for at least one year. Demographic characteristics, presence of polypharmacy, number of medications, duration of chronic medication use, and comorbid diseases were determined. The Modified Morisky scale (MMS) whose validity and reliability of the Turkish version has been evaluated was used to determine medication adherence in the patients. To analyze adherence-related factors, Spearman's correlation coefficient was used.

Results: The mean age of the 316 patients was 68.6±6.8 years, the mean number of chronic diseases was 2.49±1.2, the mean number of medications was 4.53±2.2, and the mean duration of medication use was 12.8±7.7 months. The analysis of patients' medication adherence using the MMS revealed that the level of motivation to medication adherence was 97.2% and knowledge level was 97.5%. The level of motivation to medication adherence were significantly higher in male patients (r=0.149, p=0.008) and professionally active patients (r=0.140, p=0.013). The level of knowledge of therapeutic goals was significantly higher in male patients (r=0.140, p=0.013) and professionally active patients (r=0.125, p=0.026).

Conclusion: We believe that frequent and appropriate patient education can help improve drug compliance.

Keywords: Elderly, medication adherence, Modified Morisky scale

Introduction

Although the elderly population worldwide was 841 million people in 2013, this figure is estimated to reach 2 billion by 2050 (1). The increase in the average age, which is seen as one of the biggest problems of European countries, is also being observed in Turkey. According to the data made available by the Turkish Statistical Institute, the ratio of our citizens aged 65 years and above to the overall population was 8% in 2014, which reached 8.8% in 2018 (2). Polypharmacy is an important Geriatric syndrome among elderly patients and is a problem for all patients, although it occurs mostly in the elderly (3,4). In the elderly population, the polypharmacy rate varies between 23% and 39% (3). Polypharmacy is an important problem that affects the whole world economically and in terms of healthcare (5).

With the progression of age, the frequency of chronic diseases that require use of multiple medications also increases (6). It was shown that there exist one in 90%, two in 35%, three in 23%, and four or more concomitant diseases in 14% of the population aged above 65 years in Turkey. This, along with it, leads to an increase in drug consumption (7). One of the most important factors that determines the success rate of the treatment of chronic diseases is medication adherence

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(5,8,9). Long-term medication adherence in chronic diseases in developed countries diminishes by up to 50%, whereas in developing countries, this figure is estimated to be lower (10). The rate of medication non-adherence in the elderly population ranges from 21% to 55% (3). In elderly, complex medical conditions are relatively frequent, which may indicate multiple drug therapy (11). Long-term use of medication that is both longer in duration and involves higher number of medications used in the elderly than in the younger population negatively affects medication adherence of elderly individuals (12).

Presence of multiple diseases, combined use of different treatment methods, and reduced cognitive functional capacity are indicated as factors that reduce medication adherence (13). This deteriorates the quality of life of the elderly population.

To achieve medication adherence in patients, level of disease perception, level of disease-related knowledge, will, and motivation are important (14). In many clinical trials, the average rates of medication adherence may be significantly higher depending on the study population selected and the attention paid to patients; however, the mean rate of medication adherence among patients treated for chronic conditions is reported to be between 43% and 78% (15-17). Therefore, we believe that it is important to increase the number of studies on medication adherence and the factors related to it (especially in elderly patients). There is no gold standard method to determine the level of medication adherence based on disease perception, level of knowledge, and motivation, but it is still possible to assess medication adherence using surveys and scales developed for this purpose (18). The Turkish Modified Morisky scale (MMS), whose validity and reliability in Turkish was examined by Vural et al. (19), is a short and easy-to-apply test to evaluate the habit of medication use.

Using the MMS, the present study aimed to evaluate medication adherence, level of motivation, and knowledge of patients aged 60 years and above who have been on chronical follow-up at our family medicine clinic, which is a tertiary center, and to investigate the factors associated with medication adherence.

Materials and Methods

Patients and Study Design

This prospective study includes patients aged 60 years and above who were admitted to the Family Medicine Outpatient Clinic of the Bakırköy Dr. Sadi Konuk Training and Research Hospital in the University of Health Sciences Turkey between January and April 2019 and who had been on chronic medication use for at least 1 year. Patients (n=428) who had been on chronic medication use for less than one year and those who were unwilling to participate in the study (n=84) were excluded. A total of 316 patients suitable for the study were included. Chronic medications used by patients were prospectively analyzed in terms of medication adherence and adherence-related factors. Demographic characteristics of the patients, presence of polypharmacy, number of medications at the time of first admittance, duration of chronic medication use (1 year, 1-5 years, 5 years and more), and comorbid diseases as well as number of such diseases were identified. Data concerning what group of medications the patients used was also recorded. In our study, the use of five and more medications was considered polypharmacy (5).

Patients were analyzed in terms of educational background as no degree, elementary school, secondary school, high school, or university; in terms of marital status as single, married, or widowed; and in terms of professional status as housewife, pensioner, and employed. This study was approved by the Ethical Committee of University of Health Sciences Turkey, Bakırköy Dr. Sadi Konuk Training and Research Hospital (2018/452). The authors assert that all procedures contributing to this work comply with the ethical standarts in Bakırköy Dr. Sadi Konuk Training and Research Hospital and the Helsinki Decleration of 1975, as revised in 2008. The participants' consent to parcipate in the study was requested personally from each individual.

Modified Morisky Scale

The MMS, whose validity and reliability in Turkish have been confirmed, was used to assess the medication adherence of patients (20). The Turkish MMS is a short and easy-to-apply test comprising six questions, which can evaluate the levels of knowledge and motivation for medication use separately. MMS is used to question whether there is a belief in the benefit of treatment as well as to investigate the habit of taking medications on time and the state of forgetting to take medications or quitting medications use. The six items in this test are as follows: 1. Do you ever forget to take your medicine/medication? (yes/no); 2. Are you careful to take your medicine/medication on time? (yes/no); 3. Have you stopped taking your medication when you feel good? (yes/no); 4. Sometimes when you feel bad, do you think that this is due to the drug and stop taking the drug? (yes/no); 5. Do you know the long-term benefits of taking medication? (yes/no); and 6. Do you ever forget to get your medication prescribed even though it is time? (yes/no). Questions were answered as yes/no. While assessing the responses, yes is considered equal to 1 point and no to 0 point in the 2nd and 5th questions, whereas yes is considered equal to zero point and no to one point in other questions. A total score of 0 or 1 in the questions 1, 2, and 6, indicates low motivation level, whereas a total score of >1 indicates high level of motivation. A total score of 0 or 1 in the questions 3, 4, and 5 indicates low level of knowledge, whereas a total score of >1 indicates high level of knowledge.

Statistics

All data was analyzed using SPSS software (SPSS Inc, Chicago, IL) for Windows 15.0 version. Categorical variables were given as ratios, whereas continuous values were expressed as mean ± standard deviation. Chi-square (χ^2) test was used to assess medication adherence as per gender. To assess medication adherence based on the MMS and adherence-related factors, analysis was performed using Spearman's correlation test. P<0.05 was considered statistically significant.

Results

The mean age of 316 patients included was 68.6±6.8 years, and the female and male patients accounted for 57% (n=180) and 43% (n=136), respectively, of the study population. Demographic status of all patients, their clinical characteristics, and the medications used are shown in Table 1.

The response rates of all patients to the questions in the MMS and medication adherence as per gender are shown in Table 2. Medication adherence as per gender showed a significant difference only in question 4. Further, 5.1% (n=16) of the patients provided the response "yes" to the "Have you stopped taking your medication thinking sometimes that, when you feel bad, it was because of your medication?" question. In particular, the rate of medication discontinuation among the female patients was significantly higher than that among the male patients (p=0.02).

MMS assessment of medication adherence in the patients and adherence-related factors are shown in Table 3. Accordingly, the motivation level in medication adherence was 97.2% and the knowledge level was 97.5%. The level of motivation for medication adherence was significantly higher in male patients (r=0.149; p=0.008), professionally active patients (r=0.140; p=0.013), and patients using proton pump inhibitors (PPIs) (r=0.120; p=0.033). However, among patients using bronchodilators (r=-0,178; p=0.001), the level of motivation for medication adherence was statistically significantly lower. Although the level of motivation for medication adherence was positively correlated with age; educational background; number of medications; and antihypertensive, anti-ischemic, antirheumatic, anti-osteoporotic, and antidepressant medications, this correlation was not statistically significant. Although there was a negative correlation between marital status (widowed), number of chronic diseases, duration of chronic medication use, and antidiabetic drug use, this correlation was also not statistically significant. The level of knowledge in medication adherence was significantly higher among male patients (r=0.140; p=0.013) and professionally active patients (r=0.125; p=0.026). In addition, the level of knowledge in medication adherence was not correlated with age, educational background, marital status, number of chronic diseases, number of medications and duration of their use, and other medications used.

Discussion

With the increase in the frequency of chronic diseases in societies, use of multiple medications is also increasing. Particularly in elderly patients, polypharmacy leads to negative consequences in terms of adverse effects and drug interactions as well as deteriorates the quality of life of patients. The quality of life of the growing elderly population worldwide is aimed

Table 1. Demographic and clinical characteristics of all patients (n=316)

Gender, n (%), F/M	180 (57) /136 (43)
Age, year (mean ± SD)	68.6±6.8
Number of chronic diseases (median, min-max)	2 (1-6)
Number of chronic medications (median, min-max)	4.5 (1-10)
Duration of chronic medication use, month (mean ± SD)	12.8±7.78
Presence of polypharmacy, n (%)	158 (50)
Educational background, n (%)	
No degree	5 (1.6)
Elementary school	143 (45.3)
Secondary school	44 (13.9)
High school	75 (23.7)
University	49 (15.5)
Marital status, n (%)	
Single	20 (6.3)
Married	223 (70.6)
Widowed	73 (23.1)
Occupational status, n (%)	
Housewife	123 (38.9)
Retired	120 (38)
Currently employed	73 (23.1)
Medications used, n (%)	
Oral antidiabetic	114 (36.1)
Insulin	20 (6.3)
ACE/ARB inhibitor	201 (63.6)
Diuretic	138 (43.7)
Calcium channel blocker	100 (31.6)
Betablocker	117 (37)
Antiaggregants (ASA and/or clopidogrel)	66 (20.9)
Anticoagulant (warfarin and/or NOAC)	39 (12.3)
Antihyperlipidemic medication	74 (23.4)
Antithyroid medication	61 (19.3)
Bronchodilator	36 (11.4)
Antirheumatic medication	10 (3.2)
Antiosteoporotic medication	38 (12)
Antineuropathic medication	21 (6.6)
Antidepressant medication	62 (19.6)
Proton pump inhibitor	104 (32.9)
Other medications	101 (32)

N: Number of patients, F: Female, M: Male, SD: Standard deviation, min: Minimum, max: Maximum, ACE: Angiotensin-converting enzyme, ARB: Angiotensin receptor blocker, ASA: Acetylsalicylic acid, NOAC: Novel oral anticoagulants

Table 2. Medication adherence and gender distribution of all patients based on the modified Morisky scale

Scale questions*	All patients	Female	Male	p **
Q1, n (%), yes/no	33 (10.4)/283 (89.6)	23 (7.3)/157 (49.7)	10 (3.2)/126 (39.9)	0.12
Q2, n (%), yes/no	315 (99.7)/1 (0.3)	180 (57)/ -	135 (42.7)/1 (0.3)	0.19***
Q3, n (%), yes/no	14 (4.4)/302 (95.6)	11 (3.5)/169 (53.5)	3 (0.9)/133 (42.1)	0.10***
Q4, n (%), yes/no	16 (5.1)/300 (94.6)	14 (4.4)/166 (52.5)	2 (0.6)/134 (42.4)	0.02***
Q5, n (%), yes/no	301 (95.3)/15 (4.7)	170 (53.8)/10 (3.2)	131 (41.5)/5 (1.6)	0.43
Q6, n (%), yes/no	25 (7.9)/291 (92.1)	17 (5.4)/163 (51.6)	8 (2.5)/128 (40.5)	0.24

N: Number of patients, Q: Question, *: Modified Morisky scale (please see the method section), **: chi-square (χ^2) test, ***: Fischer's Exact test

Table 3. *Factors related to medication adherence in all patients based on the modified Morisky scale

	n (%)	Associated factors	Correlation coefficient (r)	p **
Level of motivation in medication adherence* **	**307 (97.2)**	Male gender Occupation (professionally active) Bronchodilator use Proton pump inhibitor use	0.149 0.140 -0.178 0.120	0.008 0.013 0.001 0.033
Level of knowledge in medication adherence** **	**308 (97.5)**	Male gender Occupation (professionally active)	0.140 0.125	0.013 0.026

N: Number of patients, Q: Question , *: Modified Morisky scale (see the Method section), **: Spearman's Correlation test, ***: The level of motivation in medication adherence was not significantly correlated with age, educational background, marital status, number of chronic diseases, number of medications used and duration of their use, and other medications used (data not shown), ******: The level of knowledge in medication adherence was not significantly correlated with age, educational background, marital status, number of chronic diseases, number of medications used and duration of their use, and other medications used (data not shown)

to be improved. We believe that it would contribute to the practices of family medicine to investigate motivation and knowledge levels in medication adherence among the elderly and to identify adherence-related factors. The present study investigates medication adherence in elderly patients with polypharmacy who were admitted to our family medicine outpatient clinic as well as the related factors.

The 316 elderly patients admitted to our family medicine outpatient clinic had a mean age of 68.6 years, and the female patients accounted for 57% of the study population. Similar to the literature, the number of medications used was 4.5 and the mean duration of medication use was 12.8±7.78 months. In many studys which examined medication use among patients in Turkey, multiple drug use rate was found to be more common in patients older than 65 years of age and females (20-23).

The study by Lesage (24) on multiple medication use reported that polypharmacy was higher in female patients aged 65 years and above. Similarly, the UK's Public Health Statistics show that individuals aged above 60 years constitute one-fifth of the population, but half of all the medications prescribed belong to these individuals (25). Medication adherence is highly important in terms of polypharmacy risk of the elderly population and the success of treatment.

In the present study, medications for cardiovascular system were the most common ones used by the elderly patients and these medications included angiotensin-converting enzyme/angiotensin receptor blocker, inhibitors at a rate of 64%, diuretics at 44%, and betablockers at 37%. The group of medications used most commonly after cardiovascular medications was found to be PPIs at a rate of 33%. In the study by Ozturk and Gulen Ugras (21) cardiovascular medications were the most commonly prescribed medications at a rate of 31%, which was similar to that in the present study. Moreover, in a study by Arslan et al. (26), it was reported that the most prescribed medications for elderly patients were cardiovascular medications. In another study, antihypertensive medications were reported to be the most commonly used medications at a rate of 68% (22).

In the present study that investigates medication adherence of elderly patients, the levels of motivation and knowledge were found to be 97.2% and 97.5%, respectively, which was quite high. The education level of the patients we serve in our region was high (Table 1). We think that the patients' motivation and knowledge levels are high because they frequently meet with the same physician and are informed at every visit. The level of motivation for medication adherence was found to be higher in the male patients. Female patients had a higher rate of medication discontinuation. In the study by Krousel-Wood et al. (27), a high proportion i.e., 52% of elderly individuals adhered to their medications. However, in the study by Demirbag and Timur (22), 85.5% of elderly individuals did not regularly use their medications. In another study was also found that the majority of the elderly patients did not regularly use the prescribed medications (28). In a study by Akkuş and Karatay (29), 52.4% of the elderly patients often forgot about taking their medications and the time and quantity of their

medication. In the present study, the rate of forgetting to take medication/s in any time period was 33%. However, in general, the patients herein stated that they paid attention to taking their medications on time. The rate of occasionally forgetting to take their prescribed medication was 25%. The mean duration of medication use herein was 13 months, and we believe that the rate of medication discontinuation is low because of the long-term benefits of the medications used owing to chronic diseases and considerable deterioration of the quality of life caused by the clinical outcomes that occur when medications are not used; therefore, the patients are highly adherent. In the study by Arslan and Eser (7), it was found that 25% of the elderly were taking breaks from using their medications and this was because the elderly were not sufficiently aware of the importance of the regular use of medication. In the present study, the high level of motivation for medication adherence is associated with male gender, being professionally active, and use of PPIs. The high medication adherence associated with PPIs might be related to the sense of safety that it offers to patients because PPIs alleviate adverse effects in cases of multiple medication use (antiaggregants, anticoagulants, etc) and are used for the diagnoses of reflux/gastritis. In contrast, the use of bronchodilator was negatively correlated with medication adherence. This correlation might be associated with the occasional need for the medication depending on the frequency of patients' complaints and perhaps the inadequate level of awareness of its importance. In another study conducted by Solmaz and Akin (28) reported that one of the most important problems affecting medication use in the elderly is low level of education. In the study by Demirbag and Timur (22), there was a statistically significant correlation between educational background and regular use of medications. In the present study, the level of motivation for medication adherence was positively correlated with educational background although this correlation was not statistically significant.

Study Limitations

There is a need for further large-scale and multicentric studies with more participants.

Conclusion

The levels of motivation and knowledge concerning medication adherence of the elderly within family medicine practices are quite high in our study. However, there remains a proportion of 25%-33% of the elderly patients who occasionally forget to take their medication and/or get their medication prescribed. The levels of motivation and knowledge appear to be lower in female patients. Although adherence to antihypertensive and cardiac medications is better, we believe that the lower level of motivation in bronchodilator use and antidiabetic medication use (insulin and oral antidiabetic medications) should not be ignored. Therefore, the importance of proper and regular medication use should be explained during each visit and individual awareness should be raised in each patient. We believe that often and proper training will be useful in achieving a considerable reduction in the improper use of medication by the elderly and an improvement in their medication adherence, thereby facilitating preventive and therapeutic medicine in the practice of family medicine.

Ethics

Ethics Committee Approval: This study was approved by the Ethical Committee of University of Health Sciences Turkey, Bakırköy Dr. Sadi Konuk Training and Research Hospital (2018/452).

Informed Consent: The participants' consent to parcipate in the study was requested personally from each individual.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: Ö.P., M.Ç., H.P., M.Y., Concept: Ö.P., M.Y., Design: Ö.P., M.Y., Data Collection or Processing: Ö.P., M.Ç., H.P., M.Y., Analysis or Interpretation: Ö.P., M.Ç., H.P., M.Y., Literature Search: Ö.P., M.Ç., H.P., M.Y., Writing: Ö.P., M.Ç., H.P., M.Y.

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ORIGINAL RESEARCH

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What is the Role of the Geriatrician in Home Health Care?: An Overview Through an International Survey

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Abstract

Objective: To conduct an international survey among geriatricians on their current home care practice and opinions on the role of geriatricians in home care.

Materials and Methods: A survey consisting of 11 multiple-choice questions was administered to geriatricians from Turkey, Europe and the United States of America (USA) between January 2016 and March 2016. The survey included questions about the current practice of geriatricians in home care, Geriatric syndromes they observe in home care patients, opinions on whether the general practitioner should report the medical condition of home care patients to the geriatrician, what the geriatrician's role should be and components of the comprehensive assessment form which should be included in home health care. Answers were collected in a single center.

Results: Forty-three geriatricians from Turkey and 18 geriatricians from five different European countries and the USA participated in the survey. Forty-four percent (n=27) stated that they currently offer visits to home care patients. Eighty-two percent (n=50) of participants thought that geriatricians should provide consultations to home care patients and 44.3% (n=27) thought that geriatricians should visit patients directly.

Conclusion: Almost 45% of geriatricians visit home care patients in their current practice. Nearly 85% of geriatricians thought that the general practitioner should report the medical condition of home care patients to the geriatrician, along with annual comprehensive geriatric assessment. Serving as a "consultant physician" was agreed upon by more than 80% of participants regarding the role of geriatricians in the practice of home care.

Keywords: Geriatrics, home health care, primary care, public health

Introduction

The population aged 65 years and over is increasing worldwide. The World Health Organization reports that 125 million people are aged 80 years or older (1), which has resulted in an increasing demand for healthcare services globally (1,2). The population is aging in Turkey in a similar trend. Turkish Statistical Institute reports the proportion of the Turkish population aged 65 years and over has risen to 9.1% in 2019 (3). Caring for the growing number of elderly people and preventing disabilities are novel priorities both for the European Union and the Turkish Ministry of Health (4-6). Physical disability and frailty often increase with age, and cognitive disorders may trap the elderly in their home. Optimal home care can prevent undesirable outcomes including transition to intensive care or long-term care facilities (7). Consequently, social and healthcare services provided at home are becoming increasingly important.

Disparities are observed between countries regarding the role of the geriatrician in home care. Unfortunately, there is lack of data on the contribution of geriatricians to home care practice in Turkey. Understanding how geriatricians currently contribute

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to home care and their opinion on the issue might help improve home care services. In this study we surveyed geriatricians from Turkey, Europe and the United States of America (USA) to determine their role in home health care.

Materials and Methods

Study Design and Survey Development

A survey was developed based on the general guides of home care services and comprehensive geriatric assessment. The survey consisted of 11 multiple-choice questions about the current practice of geriatricians in home care, Geriatric syndromes they observe in home care patients; their opinions on whether the general practitioner (GP) should report the medical condition of home care patients to a geriatrician, what the role of a geriatrician should be and which components of the comprehensive assessment form should be included in home care practice. Some of the questions had multi select answer options (supplementary 1). Google Forms was used for online survey. The survey was administered to geriatricians from various cities in Turkey, Europe and the USA between January 2016-March 2016. Answers of the geriatricians who agreed to participate in the study were collected in a single center. Participants were able to answer the survey questions only once.

Statistics

The surveys were coded and scanned into a Google database. The proportions of answers to each question (with 95% CIs) were calculated.

Results

Sixty-one geriatricians participated in the survey. Forty-three were geriatricians from Turkey, 15 from 8 different European countries (Austria, Belgium, Finland, Germany, The Netherlands, Portugal, Principality of Monaco, and Spain) and 3 from the USA. Twenty-seven of 61 (44.2%) geriatricians stated that they offered visits to home care patients. Twenty-three (53.5%) Turkish geriatricians and 4 (22.2%) foreign geriatricians offered visits to home care patients. Among these 27 geriatricians, 92.6% (n=25, 19 Turkish and 6 foreign) offered phone consultations, 74.1% (n=20;15 Turkish and 5 foreign) examined the patient in-person; 18.5% (n=5, 2 Turkish and 3 foreign) stated that they consult patients at the request of their GPs (Table 1). Among participants offering visits to home care patients, 17 (40.5%) Turkish geriatricians visited 1 to 10 patients and 6 (14.3%) Turkish geriatricians visited 11 to 50 patients (monthly). One (5.6%) foreign geriatrician visited 1 to 10 patients and 2 (11.2%) foreign geriatricians visited 11 to 50 patients (monthly).

The most frequent Geriatric syndromes they observed in home care patients were as follows: malnutrition (56%), polypharmacy (51%), urinary or fecal incontinence (49.2%) and dementia (49.2%). The participants stated that the comprehensive assessment form should include assessments of malnutrition (96.7%), depression (90.2%), polypharmacy (88.5%), urinary incontinence (88.5%) and falls/fear of falls (88.5%) (Table 2). Eighty-four percent (n=51, 37 Turkish and 14 foreign) of participants thought that the GP should report the medical condition of home care patients (along with annual Comprehensive Geriatric Assessment) to the geriatrician.

The question regarding the responsibility of the geriatrician in home care practice had multi select answer options. A total of 82% (n=50, 35 Turkish and 15 foreign) believed that geriatricians should provide consultation for home care patients while 44.3% (n=27, 14 Turkish and13 foreign) thought that geriatricians should provide direct patient care (Table 3).

Discussion

This international survey revealed that up to 45% of geriatricians currently offer visits to home care patients. Nearly 85% of geriatricians thought that the GP should report the medical condition of home care patients (along with annual

Table 1. Follow-up of home care patients by a total of 61 geriatricians

	Total	Turkish geriatricians	Foreign geriatricians
	N (%)	N (%)	N (%)
Phone call with the care giver	25 (92.6)	19 (44.2)	6 (35.3)
Visit the patient in-person	20 (74.1)	15 (34.9)	5 (29.4)
Consultation requested by the GP	5 (18.5)	2 (4.7)	3 (17.6)

GP: General practitioner

Table 2. Components of the comprehensive assessment form the participants thought shouldbe included in home care

	N (%)
Malnutrition screening	59 (96.7)
Depression screening	55 (90.2
Questioning of polypharmacy	54 (88.5)
Questioning of fecal/urinary incontinence	54 (88.5)
Evaluating falls/fear of falling	54 (88.5)
Pressure sore assessment	53 (86.9)
Dementia screening	53 (86.9)
Evaluating pain	52 (85.2)
Evaluating hearing/sight	52 (85.2)
Evaluating sleep	51 (83.6)
Frailty criteria	50 (82)
Vaccination state	49 (80.3)
Evaluating sarcopenia	33 (54)

Table 3. Opinions of 61 participants regarding therole geriatrics in home care

	Total	Turkish geriatricians	Foreign geriatricians
	N (%)	N (%)	N (%)
Should visit patients directly	27 (44.3)	14 (33.3)	13 (72.2)
Should provide consultations when needed	50 (82)	35 (83.3)	15 (83.3)

Comprehensive Geriatric Assessment) to the geriatrician. Regarding the geriatrician's role in home care, more than 80% of participants stated that geriatricians should serve as "consultant physicians" for home care patients.

Practices in home health care for older adults have not been widely researched. A study from Istanbul/Turkey reported that 73% of calls for home care visits were requested by older adults (8). According to the study, although the demand was high, very few visits (13% of total) were actually delivered to older adults and people with disabilities. The authors of the aforementioned study (8) stated that som e older adults demanded home visits even though they had no serious medical restrictions. They had repeat requests for difficulty in walking, joint pain or only psychological/emotional demands. Other reasons for the limited number of visits delivered were time constraints, biases involving the selection of patients and lack of training. Older adults mostly required home care services for "Geriatric syndromes" such as decreased functionality, chronic pain and depression, all of which need to be evaluated through "comprehensive geriatric assessment". Unmet treatment needs may have led older adults to call home services repetitiously. Hence, the contribution of a geriatrician might make a significant difference. A previous study held in China reported that services addressing the needs of dementia patients' and their caregivers were lacking in quality and quantity (9). Physicians in the rural areas were not confident in their skills for diagnosing and treating dementia. Another study concluded that geriatricians and GPs need to work in collaboration to provide the best possible home health care (10). However, from the GPs perspective, a consultant physician may not know the complete history as opposed to a GP's personal relationship with the patient (11). As the results of our survey indicate, patients may be consulted with a geriatrician on the GP's request and the GP may then orchestrate the patient's overall management.

We observed a difference between Turkish and foreign geriatricians in their answers to a few questions. Turkish geriatricians generally visited higher number of patients than foreign geriatricians. A higher number of foreign geriatricians, as compared to Turkish geriatricians, thought that geriatricians should visit the patients directly besides serving as a consultant (72.2% vs 33.3%, respectively). This may be because the job description of physicians, health care systems, availability and public funding of home care services vary across countries (12).

It has been shown that geriatric intervention provides clinical benefits such as early discharge from hospital, cost-effectiveness, reduced incidence of polypharmacy and reduced mortality (13-15). Geriatricians contribute greatly to the home health care of elderly with respect to quality of life, frailty and other Geriatric syndromes (16,17). Older population is a significant user of health services, thus public health network has been reorganizing to adapt to the increasing demand for caring older adults (4,5,18,19). Therefore, the contribution of geriatric assessment in home care practice is becoming ever more crucial. In the present study, participants mostly agreed that the contribution of geriatricians to home health care was necessary. Moreover, almost all participants agreed on evaluating Geriatric syndromes through comprehensive geriatric assessment. A higher prevalence of Geriatric syndromes such as dementia, urinary incontinence and malnutrition were reported in home care patients. Dementia, one of the major causes of disability among the elderly, often coexists with malnutrition. A reduction in energy intake, atrophy of brain regions which control appetite and energy balance, change in dietary habits and swallowing problems may account for this observation (20). Urinary incontinence is also a common problem in advanced dementia, making it one of the most frequently reported Geriatric syndromes in our survey.

Our study has some drawbacks and strengths. First of all, the number of foreign participants were slightly lower. In addition, as health care systems vary across countries, attitudes and practices of physicians related to home care may differ considerably. Thus, a larger study sample is needed to be able to generalize our results. As has been stated in a review on home care (21), studies that provide detailed information on the issue of home care, especially those comparing countries, are limited. To the best of our knowledge, the present study is the first in literature to question the role of geriatricians in home care practice. Further international studies which focus on the recommendations of geriatricians regarding home health care may help improve health care services for the elderly population worldwide.

Conclusion

Geriatricians in Turkey and abroad thought that the medical condition of home care patients should be reported to them and that they should serve as "consultant physicians".

Acknowledgements

We thank all of the participants who took time from their busy schedule to participate in this study.

Ethics

Ethics Committee Approval: The study is a survey among physicians.

Informed Consent: The study is a survey among physicians.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Design: B.İ., A.T., B.C., G.B., M.A.K., Data Collection or Processing: A.T., Analysis or Interpretation: A.T., G.B., M.A.K., Literature Search: B.İ., B.C., Writing: B.İ., B.C.

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CASE REPORT

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Oculomotor Dysfunction in Parkinson's Disease

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Abstract

Parkinson's disease and associated wide variety of ocular features are very common. One of the most notable findings includes oculomotor. Since reading includes a proper synchronization of accommodation, vergence and versional movements, thus, a defect in any of this system will impair one's ability to read and track letters while reading and writing. A comprehensive oculomotor assessment is an essential element in diagnosing any underlying oculomotor defect in Parkinson's disease.

Keywords: Parkinson's disease, reading difficulty, Developmental Eye Movement test

Introduction

Parkinson's disease is a neurodegenerative disorder associated with a wide spectrum of motor symptoms which includes tremor, bradykinesia, rigidity and non-motor symptoms which includes cognitive impairment, sensory dysfunction and visual hallucinations (1-3). Visual problems associated with Parkinson's are very common and can either be linked with retinal dopamine depletion or reduced dopaminergic innervation of the visual cortex (4,5). The dopamine also has an effect in various vision processes such as oculomotor control, colour vision, contrast sensitivity and spatial working memory (6,7). The oculomotor function of one's eye is responsible for various activities like reading, focusing an object at distance and near, seeing objects in an around. Any disturbance to this network would have an impact of daily activities.

Case Report

Fifty nine year old female reported to the outpatient department with a complaint of losing track while reading and difficulty performing tasks in dim illumination. She denied any history of ocular and head trauma. No surgery history was also noted. She reported being diagnosed with Parkinson's disease since past one year of visit and was under medications for the same. She was also on physiotherapy and speech therapy for the same. On observation it was noticed that she had a mild tremor on her hands, bradykinesia and slurring of speech. Informed consent was obtained from her prior proceeding to the testings. Her best corrected visual acuity was 20/20 with a distance correction of +1.75DS/-0.50DC x 90 in both eyes. Near visual acuity was N6 with an addition of +2.75D. Cover test revealed a near exophoria. Extra-ocular motility showed a restriction in the up gaze, dextroelevation and levoelevation. On measuring the convergence amplitude with an accommodative target along with her habitual prescription, a poor convergence amplitude was found i.e. >30 centi-meter and on measuring the same with red-green glass it was noted that the patient did not appreciate red and green lights together and had actually suppressed one eye due to poor convergence. Saccades and pursuits were poor based on Northeastern State University College of Optometry scores. Developmental eye movement (DEM) test showed delayed horizontal and vertical test timing and an abnormal ratio scores. Pupillary assessment revealed normal reacting pupil in both eyes with no afferent pupillary defect being present. Slit lamp examination showed normal ocular adnexas. Intra-ocular pressure of both eyes was within normal limits. No visual field defect was noted. Dilated fundus examination showed normal appearing fundus and normal cup-disc ratio. The oculomotor evaluation values are tabulated in Table 1. The diagnosis of oculomotor deficit secondary to Parkinson's was made due to reduced convergence ability, poor saccades and pursuits, reduced DEM scores and reading ability.

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Table 1. Oculomotor evaluation of the patient

Diagnostic tests	Values
Cover test-distance	Orthophoia
Cover test-near	8 exophoria
Convergence amplitude (accommodative target)	23 cm
Convergence amplitude (red-green target)	>30 cm
Reading rate with English text	23 words/minute
Reading rate with local language	29 words/minute
Saccades NSUCO grading-ability Saccades NSUCO grading-accuracy Saccades NSUCO grading-head movements Saccades NSUCO grading-body movements	3 3 3 4
Pursuits NSUCO grading-ability Pursuits NSUCO grading-accuracy Pursuits NSUCO grading-head movements Pursuits NSUCO grading-body movements	2 2 3 4
DEM vertical time (test A+B)	58 seconds (<1%, percentile score)
DEM horizontal time (test C)	74 seconds (<1%, percentile score)
DEM ratio score	1.27 (4%, percentile score)

NSUCO: North-eastern State University College of Optometry, DEM: Developmental eye movement

The patient was then trained with home based vision therapy to enhance the convergence amplitude as well as to improve the saccadic and pursuit pattern. A follow-up of 6 months was also scheduled.

Discussion

The novelty of this case is to highlight the necessary oculomotor testing pattern in a patient with Parkinson's. Despite using a proper refractive correction, the patient experiences reading problem. Slowing in the reading pattern might be attributed due to poor accommodation and vergence as well as eye movements. A longer duration of fixations and poor saccades in patients with Parkinson's has been reported to contribute towards poor reading (8). A study by Jehangir et al. (9) revealed that patients with Parkinson's exhibit a slower saccadic reading. In contrast to this, in this case the patient also exhibited a poor saccadic and pursuit ability and accuracy. The pursuit ability is the number of rotations made on pursuits and the saccadic ability is the number of saccadic round trips made on saccades. Similarly the accuracy of saccades is the amount of overshooting and undershooting, while the accuracy of pursuits implies the number of target losses or refixations on making a pursuit movement. The head and body movements are the qualitative grading made during the measurements. The responses were noted on a scale of five where five being the highest score with good eye movements and one for the least. This gave an indication of the hampered oculomotor system where the ability and accuracy were extremely poor.

Similarly in DEM testing the percentile scores of horizontal and vertical time as well as the ratio score was below the mean percentile rank (<1% for horizontal and vertical time and 4% for ratio score). Assessment of vertical time is important since it determines the naming speed or automaticity of an individual. Likewise, the horizontal time evaluates the naming ability in a horizontal spatial array. The horizontal time, vertical time and the ratio score of the patient were below the age level i.e. for highest grade level, the patient's performance is lower than the expected age level with impaired level scores that indicates a deficiency in both automaticity and oculomotor skills, thus influencing her reading rate too.

On the other hand convergence insufficiency also has an impact on reading performance of an individual. Poor convergence in Parkinson's is well studied in the previous literatures (10,11). A study by Irving et al. (12) have reported a higher prevalence of convergence insufficiency in patients with Parkinson's as compared to the normal. The patients had significant amount of reduced convergence amplitude along with higher exophoria for near and reduced positive fusional vergence when compared to the controls. A similar pattern of reduced convergence amplitude with near exophoria was also seen in this case that contributed towards a poor oculomotor control.

DEM test is a validated and reliable method to measure the indirect oculomotor performance (13). A study by Palomo-Álvarez and Puell. (14) found poor readers have a reduced horizontal test timing in DEM impairing their reading speed. Likewise Adler-Grinberg in their study has also found that poor readers exhibits short saccades, longer fixations and more regressions than the normal (15). Thus a DEM test along with an appropriate measurement of saccades and pursuits provides

a gross deficit of the oculomotor system and can be useful in conditions affecting the same such as traumatic brain injury, Parkinson's disease, dyslexia and associated binocular vision anomalies.

Ethics

Informed Consent: Informed consent was obtained from her prior proceeding to the testings.

Peer-review: Internally peer-reviewed.

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The Synergistic Effects of Lipoic Acid and Vitamin B in Sarcopenia

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To the editor,

There is a need for a proactive and holistic approach and a common mind to solve the problems of increasing of geriatric population both in number and ratio because of various reasons such as the emergence of geriatric syndromes as a result of multiple diseases and multiple risk factors. The causes of sarcopenia are not completely known due to diagnostic problems which are mostly originated from the complexity of atypical symptoms and the identification of etiopathogenesis with different mechanisms and; therefore, there is no definitive treatment of sarcopenia (1). The etiopathogenesis of sarcopenia in older patients includes chronic inflammation and impaired oxidant-anti-oxidant balance, neurological diseases, etc (2). Sarcopenia can be defined as a geriatric syndrome that leads to negative health outcomes such as decreased quality of life, limited daily activities, increased mortality rates and increased need for institutions such as geriatric care centres due to the loss of muscle mass and functions (3).

There has been a transition from a plant-based nutritional model that was rich in terms of micronutrients to a high-calorie model that lacks fibres and micronutrients (4). Similarly, during the transformation of our social structure from a pre-agricultural society to the formation of a modern society resulted in lifestyle-related metabolic diseases such as obesity and diabetes mellitus as well as neurological diseases such as cardiovascular diseases and dementia (4,5). Particularly, the contribution of vitamins B6 and B12, which play a role in methionine cycle, for homocysteine recycling that is an independent risk factor in cardiovascular and neurological diseases shows the significance of dietary factors in the prevention and treatment of diseases (6,7). Lee et al. (8) reported a statistically significant positive correlation between sarcopenia and homocysteine which is an inflammatory marker related to vascular aging. Lipoic acid is used in the treatment of diabetes and neurodegenerative diseases due to its protective and therapeutic effects such as chelating with metals in addition to free radical trapping, increasing the effectiveness of various other antioxidants, repairing oxidative damage and showing positive effects on insulin signalling pathways (9).

With the introduction of both vitamin B complexes and α-lipoic acid together for the planned treatments of older patients at a risk of sarcopenia, we will be able to prevent the social and economic vulnerability of the older people to some extent (3). We did not find any studies that investigated the efficacy of both α-lipoic acid and vitamin B complexes together in the prevention and treatment of sarcopenia. Therefore, we want to emphasise the need for further studies to show that both the anti-inflammatory and anti-oxidant effects of α-lipoic acid and the neuroprotective and homocysteine-lowering effects of vitamin B6 and B12 treatments all together can be used in older patients for primary and secondary protection of sarcopenia (8,10).

Keywords: Sarcopenia, thioctic acid, vitamin B complex

Ethics

Peer-review: Internally peer-reviewed.

Author Contributions

All authors contributed to the writing, reviewing and editing of this letter.

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