EJGG
European Journal of Geriatrics and Gerontology

galenos
yayınevi

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).

All manuscripts should be submitted through the journal's web page at www.ejgg.com Instructions for authors, technical information, and other necessary forms can be accessed over this web page. Authors are responsible for all content of the manuscripts.

- Aging
- Aging Biology
- Alzheimer's Disease
- Biogerontology
- Bone health in older people
- Cell Biology
- Clinical Geriatrics
- Clinical Geropsychology
- Cognitive Disorders
- Demography of Older Populations
- Dental and Oral Health
- Delirium
- Diabetes Mellitus
- Dizziness
- Disability
- Drugs & Aging
- Experimental Gerontology
- Economics of ageing
- Falls
- Frailty
- Geriatrics
- Geriatric Bioscience
- Geriatric Care Management
- Geriatric Depression
- Geriatric Emergency Medicine
- Geriatric Gynecology
- Geriatric Occupational Therapy
- Geriatric Ophthalmology
- Geriatric Otolaryngology

- Geriatric Pain Management
- Geriatric Palliative Care
- Geriatric Pharmacotherapy
- Geriatric Physical Therapy
- Geriatric Psychiatry
- Geriatric Psychology
- Geriatric Rheumatology
- Geriatric Trauma
- Geriatric Urology
- Geriatric Nursing
- Geriatric Syndromes
- Gerontechnology
- Hypertension
- Healthy Aging
- Home and Community-Based Services
- Incontinence
- Long-Term Care
- Orthogeriatrics
- Polypharmacy
- Parkinsons Disease
- Parkinsonian syndromes
- Pressure Sores
- Psychological Gerontology
- Sarcopenia
- Sleep Disorders
- Syncope
- Social Gerontology
- Stroke Medicine

Special features include rapid communication of important timely issues, surgeon' workshops, interesting case reports, surgical techniques, clinical and basic science review articles, guest editorials, letters to the editor, book reviews, and historical articles in geriatrics and gerontology.

Open Access Policy

This journal provides immediate open access to its content on the principle that making research freely available to the public supports a greater global exchange of knowledge.

Open Access Policy is based on rules of Budapest Open Access Initiative (BOAI). http://www.budapestopenaccessinitiative.org/ By "open access" to [peer-reviewed research literature], we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.

Address for Correspondence

Zeynel Abidin Öztürk

Gaziantep Üniversitesi Tıp Fakültesi, Geriatri Bilim Dalı, Gaziantep, Turkey

E-mail: zaodr@yahoo.com.tr

Issuing Body

Galenos Yayınevi Tic. Ltd. Şti.

Molla Gürani Mah. Kaçamak Sok. No: 21, 34093, Fındıkzade, İstanbul, Turkiye

Phone: +90 212 621 99 25

Fax: +90 212 621 99 27

E-mail: info@galenos.com.tr

Instructions to Authors

Introductions for authors are published in the journal and on the web page www.ejgg.org/instructions-to-authors

Material Disclaimer

The author(s) is (are) responsible from the articles published in the European Journal of Geriatrics and Gerontology. The editor, editorial board and publisher do not accept any responsibility for the articles.

OPEN ACCESS

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).

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.

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.

Contributor's Statement

All submissions should contain a contributor's statement page. Each manuscript should contain substantial contributions to idea and design, acquisition of data, or analysis and interpretation of findings. All persons designated as an author should qualify for authorship, and all those that qualify should be listed. Each author should have participated sufficiently in the work to take responsibility for appropriate portions of the text.

Acknowledgments

European Journal of
Geriatrics and Gerontology

2020
Volume 2

Academic
Geriatrics
Society

EJGG

Instructions to Authors

Ethics

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.

Duplication: Use of data from another publication, which includes re-publishing a manuscript in different languages.

Salamisation: To create more than one publication by dividing the results of a study preternaturally.

We disapproval upon such unethical practices as plagiarism, fabrication, duplication, and salamisation, as well as efforts to influence the review process with such practices as gifting authorship, inappropriate acknowledgements, and references. Additionally, authors must respect participant right to privacy.

On the other hand, short abstracts published in congress books that do not exceed 400 words and present data of preliminary research, and those that are presented in an electronic environment are not accepted pre-published work. Authors in such situation must declare this status on the first page of the manuscript and in the cover letter (The COPE flowchart is available at: http://publicationethics.org).

We use iThenticate to screen all submissions for plagiarism before publication.

Conditions of Publication

All authors are required to affirm the following statements before their manuscript is considered:

1. The manuscript is being submitted only to European Journal of Geriatrics and Gerontology

2. The manuscript will not be submitted elsewhere while under consideration by European Journal of Geriatrics and Gerontology

3. The manuscript has not been published elsewhere, and should it be published in the European Journal of Geriatrics and Gerontology it will not be published elsewhere without the permission of the editors (these restrictions do not apply to abstracts or to press reports for presentations at scientific meetings)

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.

Authors of accepted manuscripts will receive electronic page proofs and are responsible for proofreading and checking the entire article within two days. Failure to return the proof in two days will delay publication. If the authors cannot be reached by email or telephone within two weeks, the manuscript will be rejected and will not be published in the journal.

Copyright

At the time of submission all authors will receive instructions for submitting an online copyright form. No manuscript will be considered for review until all authors have completed their copyright form. Please note, it is our practice not to accept copyright forms via fax, e-mail, or postal service unless there is a problem with the online author accounts that cannot be resolved. Every effort should be made to use the online copyright system. Corresponding authors can log in to the submission system at any time to check the status of any co-author's copyright form. All accepted manuscripts become the permanent property of the European Journal of Geriatrics and Gerontology and may not be published elsewhere in whole or in part ¾ without written permission.

If article content is copied or downloaded for non-commercial research and education purposes, a link to the appropriate citation [authors, journal, article title, volume, issue, page numbers, digital object identifier (DOI)] and the link to the definitive published version should be maintained. Copyright notices and disclaimers must not be deleted.

Note: We cannot accept any copyright that has been altered, revised, amended, or otherwise changed. Our original copyright form must be used as is.

Copyright Transfer Form

Abbreviations and Symbols

Use only standard abbreviations. Avoid abbreviations in the title and abstract. The full term for an abbreviation should precede its first use in the text, unless it is a standard abbreviation. All acronyms used in the text should be expanded at first mention, followed by the abbreviation in parentheses; thereafter the acronym only should appear in the text. Acronyms may be used in the abstract if they occur 3 or more times therein, but must be reintroduced in the body of the text. Generally, abbreviations should be limited to those defined in the AMA Manual of Style, current edition. A list of each abbreviation (and the corresponding full term) used in the manuscript must be provided on the title page.

Online Article Submission Process

European Journal of Geriatrics and Gerontology uses submission software powered by Online Article Submission articles the website for submissions to the European Journal of Geriatrics and Gerontology is www.ejgg.org. This system is quick and convenient, both for authors and reviewers.

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.

English Language Editing

All manuscripts are professionally edited by an English language editor prior to publication.

Subscription Information

Academic Geriatrics Society

Address: Güven Çarşısı Enez Sok. 2/176 Altındağ, Ankara, Turkey

Online Submission:

Web page: http://ejgg.org/
E-mail: info@ejgg.org

Correspondence

All correspondence should be directed to the journal's editorial.

Editor in chief: Mehmet Akif Karan
Editor: Zeynel Abidin Öztürk

◤ CONTENTS

Grading the Reduced Muscle Mass in the Context of GLIM Criteria

Gülistan Bahat[1], Tommy Cederholm[2]

[1]Istanbul University, Istanbul Medical School, Department of Internal Medicine, Division of Geriatrics, Istanbul, Turkey
[2]Uppsala University, Karolinska University Hospital, Clinic of Public Health and Caring Services, Clinical Nutrition and Metabolism, Uppsala, Sweden

GLIM criteria for the diagnosis of malnutrition (MN) has been introduced as a consensus report from the global clinical nutrition community (1). It has been created as a response to meet the need for consensus on diagnostic criteria for application of MN in clinical settings. It has been convened by several of the major global clinical nutrition societies and aimed to secure the broad global acceptance.

GLIM consensus suggested two sets of criteria: the phenotypic and the etiological criteria for diagnosis of MN. The phenotypic criteria included (i) weight loss, (ii) reduced body mass index, (iii) reduced muscle mass and the etiological criteria included (i) reduced food intake/assimilation and (ii) disease burden/inflammation. GLIM recommended that the combination of at least one phenotypic criterion and one etiologic criterion is required to diagnose MN. The threshold values for the consensus diagnostic criteria and the severity grading were also given.

The **"reduced muscle mass"** is a component for both the diagnosis and the grading the MN. Reduced muscle mass is classified as "mild to moderate" and "severe" deficit of reduced muscle mass per validated assessment methods. It has been noted that the thresholds for reduced muscle mass need to be adapted to race. However, the guidance according to severity grading by reduced muscle mass is lacking in the current GLIM format, mainly due to lack of clear evidence that the sarcopenia community provides suggestions for binary cut-offs, but not for grading (2).

Recently a Turkish population based study documented and reported cut-off points to identify sarcopenia according to European Working Group on Sarcopenia in Older People (EWGSOP) definition (3). In their revised consensus report, EWGSOP2 opted to provide recommendations for cut-off points for low skeletal muscle mass for appendicular skeletal muscle mass, but not the total skeletal muscle mass (2). After publication of EWGSOP2, it has been suggested that if a clinician assesses the total skeletal muscle mass instead of the appendicular muscle mass, then the documented Turkish total skeletal muscle mass index thresholds as 9.2 kg/m² and 7.4 kg/m² could be used in males and females, respectively (4).

In their article in United States population, Janssen et al. (5) considered class I sarcopenia as skeletal muscle mass index being within minus one to minus two standard deviations of young adult values and class II sarcopenia as skeletal muscle mass index being below minus two standard deviations of young adult values (5). Analogously, we may suggest to designate "mild to moderate" reduced muscle mass as having "muscle mass lower than young mean-one standard deviation" and "severely" reduced muscle mass as "muscle mass lower than young mean-two standard deviation" considering the total skeletal muscle mass data of the young Turkish adult study population (3). Accordingly, the stage 1: "mild to moderate" reduced muscle mass could be regarded as 10.1 kg/m² and 8.2 kg/m² and the stage 2: "severely" reduced muscle mass could be regarded as 9.2 kg/m² and 7.4 kg/m² in males and females, respectively in the Turkish population.

This approach seems feasible and the suggested cut-off points appear acceptable, particularly in ethnically similar populations, for use until we have achieved evidence enough to advise generic cut-offs for grading reduced muscle mass in the context of the GLIM criteria. Hopefully, pending GLIM or EWGSOP initiatives will be able to provide such generic muscle mass cut-off values. Globally generic cut-offs would likely facilitate applicability and implementation into clinical practice. Still

Bahat and Cederholm. Grading Muscle Mass for GLIM

Eur J Geriatr Gerontol 2020;2(1):1-2

we may consider that we may end up with regional cut-offs, due to variations in muscle mass due to ethnicity. Therefore, the nutrition and sarcopenia communities need studies that, in various populations, address population based cut-offs for muscle loss, as well as studies that evaluate predictive validity (for non-beneficial clinical outcomes) of such cut-offs.

Ethics

Peer-review: Internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: G.B., Concept: G.B., T.C, Design: G.B., T.C., Data Collection or Processing: G.B., Analysis or Interpretation: G.B., T.C., Literature Search: G.B., T.C., Writing: G.B., T.C.

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

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Cederholm T, Jensen GL, Correia MITD, Gonzalez MC, Fukushima R, Higashiguchi T, Baptista G, Barazzoni R, Blaauw R, Coats A, Crivelli A, Evans DC, Gramlich L, Fuchs-Tarlovsky V, Keller H, Llido L, Malone A, Mogensen KM, Morley JE, Muscaritoli M, Nyulasi I, Pirlich M, Pisprasert V, de van der Schueren MAE, Siltharm S, Singer P, Tappenden K, Velasco N, Waitzberg D, Yamwong P, Yu J, Van Gossum A, Compher C; GLIM Core Leadership Committee; GLIM Working Group. GLIM criteria for the diagnosis of malnutrition - A consensus report from the global clinical nutrition community. Clin Nutr. 2019;10:207-217.

2. Cruz-Jentoft AJ, Bahat G, Bauer J, Boirie Y, Bruyère O, Cederholm T, Cooper C, Landi F, Rolland Y, Sayer AA, Schneider SM, Sieber CC, Topinkova E, Vandewoude M, Visser M, Zamboni M; Writing Group for the European Working Group on Sarcopenia in Older People 2 (EWGSOP2), and the Extended Group for EWGSOP2 . Sarcopenia: revised European consensus on definition and diagnosis. Age Ageing. 2019;48:16-31.

3. Bahat G, Tufan A, Tufan F, Kilic C, Akpinar TS, Kose M, Erten N, Karan MA, Cruz-Jentoft AJ. Cut-off points to identify sarcopenia according to European Working Group on Sarcopenia in Older People (EWGSOP) definition. Clin Nutr. 2016;35:1557-1563.

4. Bahat G, Cruz-Jentoft A. Putting Sarcopenia at the Forefront of Clinical Practice. Eur J Geriatr Gerontol. 2019;1:43-45.

5. Janssen I, Heymsfield SB, Ross R. Low relative skeletal muscle mass (sarcopenia) in older persons is associated with functional impairment and physical disability. J Am Geriatr Soc. 2002;50:889-896.

ORIGINAL RESEARCH

Comparison of Tests Used in Malnutrition in Hospitalized Geriatric Patients, Relationship with Anthropometric Measurements and Hand Grip Strength

Hakan Yavuzer[1], Tuğçe Emiroğlu[1], Erol Demir[2], Abdulkadir Erçalışkan[3], Alper Döventaş[1], Deniz Suna Erdinçler[1]

[1]İstanbul University-Cerrahpaşa, Cerrahpaşa Faculty of Medicine, Department of Geriatrics, İstanbul, Turkey
[2]İstanbul University Faculty of Medicine, Department of Nephrology, İstanbul, Turkey
[3]İstanbul University-Cerrahpaşa, Cerrahpaşa Faculty of Medicine, Department of Hematology, İstanbul, Turkey

Abstract

Objective: There is no single test and recommended method ideal for nutritional risk assessment in hospitalized elderly patients. In this study, we intended to screen hospitalized elderly patients for malnutrition by using two tests and compare the results with anthropometric measurements and hand grip strength test and describe the relationship between them.

Materials and Methods: In this study, we evaluated 200 hospitalized patients aged 60 years and over in the internal medicine, cardiology and Infectious diseases departments. We applied nutritional risk screening (NRS 2002) with the hand grip test and the mini nutritional assessment (MNA). Body Mass index and upper arm and calf circumference measurements were recorded. Chi-square and ANOVA test were used for statistical analyses.

Results: Of the 200 patients, 98 were female and 102 were male. The mean age was 71.3±8.1 years. According to the NRS-2002, the prevalence of malnutrition risk was 34%; according to the MNA, the prevalence of malnutrition was 23.5%, and the prevalence of malnutrition risk was 27.5%. According to the NRS-2002, 38% of the patients at risk for malnutrition were female and 62% were male (p=0.029). The relationship between hand grip test and Mini Nutritional Assesment (MNA) was statistically significant (p<0.0001).

Conclusion: We suppose that the MNA test which was used for screening of malnutrition in outpatient setting can be used for hospitalized patients as NRS 2002, and we suggest that anthropometric measurements and hand grip test would be reliable tools for sarcopenia as malnutrition screening and assessment.

Keywords: Aged, malnutrition, inpatient

Introduction

Due to the increase in the elderly population in the world, the health problems in old age and the studies on the solution of these problems are increasing day by day (1,2). Nutritional status is also an important determinant of health in people over 65 years of age. In the 2006 European Society of Clinical Nutrition and Metabolism (ESPEN) guide, malnutrition as terminology; energy, protein and other nutrients as a result of a deficiency or excess (ie, imbalance), tissue/body form (shape, size and composition) and function is defined as a condition that can cause measurable negative effects and clinical consequences (3). Malnutrition is one of the important determinants of morbidity and mortality in the elderly. Malnutrition is associated with increased hospitalization time, impaired quality of life, delayed wound healing, negative health conditions such as infection and decreased functional capacity. The prevalence of malnutrition was found to be 5-10% in the elderly living at home, 30-60% in the elderly living in the nursing home and 35-65% in the elderly in the hospital (4). Although there are many

instruments for screening and diagnosis of malnutrition, it is known that the diagnosis of malnutrition is mostly overlooked in practice (5,6). Screening and diagnostic instruments are important in the recognition of the patient with malnutrition, in finding the underlying causes of malnutrition and in evaluating the results of malnutrition (6,7). Unfortunately, there is no gold standard for the detection of malnutrition in elderly patients. Diagnostic criteria for malnutrition according to ESPEN criteria;

- Alternative 1 : Body Mass index (BMI) <18.5 kg/m²,

- Alternative 2:

- Weight loss (unintentional) >10% indefinite of time, or >5% over the last 3 months combined with either

- BMI <20 kg/m² if <70 years of age, or <22 kg/m² if >70 years of age or

- Fat Free Mass index <15 and 17 kg/m² in women and men, respectively (8).

Malnutrition-associated sarcopenia; it is a phenotype that originates from malnutrition regardless of the cause (impairment of oral intake, malabsorption, and increased catabolism) (9). There is a decrease in fat mass as well as muscle mass.

The European Society of Parenteral and Enteral Nutrition recommends screening for nutritional status with Mini Nutritional Assesment (MNA) in elderly outpatients and screening with NRS 2002 (Nutritional Risc score 2002) in inpatients. Because the NRS 2002 test is a subjective test, it is predicted that MNA will be more appropriate for inpatients.

Therefore, in our study, the comparison of these two tests used in the screening of malnutrition in elderly hospitalized patients, the relationship with anthropometric measurements and hand grip strength were evaluated. Thus, it is aimed to show that these parameters can be used in sarcopenia and malnutrition screening.

Materials and Methods

Working Design

Between December 2011 and December 2012, 253 patients aged 60 years and older who were hospitalized in Cerrahpaşa Medical Faculty Internal Medicine, cardiology and infectious disease services were evaluated. Fifty-three patients were excluded because they did not meet the study criteria. Patients with hemiplegic, hypervolemic patients (CHF, Nephrotic syndrome), advanced stage dementia, Parkinson's disease, history of previous cerebrovascular accident, hand dysfunction, walking disorder were not included in the study. 200 patients were included in the study with consent forms.

Age, gender, weight, height and BMI values of the patients were recorded. The days of hospitalized, the number of diseases, the number of drugs used, the presence of incontinence, the presence of urinary catheter, whether alcohol, cigarette smoking, regular exercise, the number of falls in the last one year, fracture history, the presence of pressure ulcers, nutritional support treatment was questioned.

Istanbul University Cerrahpaşa Faculty of Medicine Clinical Research Ethics Committee was approved with the decision number 1834 dated 18.03.2013.

Nutritional Evaluation

All patients were evaluated by two unaware researchers. While a researcher is performing MNA short form (MNA-SF) and long form, NRS-2002 nutritional screening and hand grip tests were performed by the other researcher on the same day or the following day.

In the MNA-SF; normal was accepted 12 or higher points, the risk of malnutrition was 11 or less, malnutrition was seven or less. In MNA; normal was accepted 24 points and above; malnutrition risk between 17 and 23.5 points, malnutrition was below 17 points.

In the NRS 2002 Screening test, below three points were normal; it was accepted as a malnutrition risk of three and above.

Evaluation of Hand Grip Strength and Anthropometric Measurements

Jamar hand dynamometer was used to determine hand grip the strength. The dominant hand was determined by asking the patients which hand they used actively. The patients were placed in the chair and the elbows were placed on the table and their arms were held parallel to the floor by 90 degrees flexion; three measurements were made with one minute rest periods from both the right and left arms. Three measurements were averaged. Measurements below 30 kg in males and 20 kg in females were accepted as de low muscle strength. Patients were divided into two groups with low muscle strength and normally as two groups.

Upper arm circumferences (UAC) and calf circumferences (CC) were measured. The patients were normal 25 cm and above according to the UAC; According to CC, they were grouped as normal of 31 cm and above.

Weight, height measurements and BMI of the patients were performed. We were accepted BMI >27 kg/m² overweight, between 27-22 kg/m² normal and <22 kg/m² weak.

Statistics

All data of our study were analysed using SPSS software (SPSS Inc., Chicago, IL) version 16.0. Variables (age, gender, weight, height, BMI, number of days of outpatient treatment, number

of diseases, number of drugs used) were defined as mean standard deviation, minimum, maximum, median, interquartile range (IQR-inter quartile range). One-way Analysis of Variance test was used for comparison of continuous variables (MNA-SF and MNA score) between groups (NRS-2002 and hand grip strength). Tukey HSD (Tukey's Honestly Significant Difference test) method was used as post hoc evaluation. Student t-test and corrected t-test were used for comparison of independent groups (age, weight, height, BMI, UAC, CC, Hand Grip test, number of drugs used, number of additional diseases, number of falls, NRS-2002 score, MNA-SF score, MNA score). In the comparison of categorical variables (MNA score, NRS-2002 score, Hand Grip test, UAC, CC), chi-square test or Fisher exact test was applied. Continuous values were expressed as mean and standard deviation.

Results

A total of 200 patients were included in the study as 98 (49%) were female and 102 (51%) were male. The mean age of women was 71.3 ± 8.1 and males were 70.9 ± 7.6. Demographic data by sex are given in Table 1. There was no significant difference between MNA-SF, MNA scores with sex. The NRS-2002 score was significantly higher in males (p=0.007).

Patients were divided into three groups according to MNA-SF score as normal, malnutrition risk and malnutrition. The risk of malnutrition was detected in 67 of the 200 patients (33.5%) and malnutrition was detected in 56 patients (28%). Seventy seven of the patients (38.5%) had normal nutritional status. Twenty eight (50%) of the patients with malnutrition were female and 28 (50%) were male (p=0.174). Patients were divided into three groups according to MNA score as

normal, malnutrition risk and malnutrition. Fifty five of the 200 patients (27.5%) had malnutrition risk, and 47 (23.5%) had malnutrition. Ninety eight (49%) of the patients were normal. Twenty four patients (51%) with malnutrition were female and 23 (49%) were males (p=0.26).

Patients were divided into two groups as normal and malnutrition risk according to NRS-2002 Screening test. Malnutrition risk was detected in 68 (34%) of 200 patients. One hundred thirty two (66%) of the patients were included in the normal group. Forty two (61%) of malnourished patients were male and 26 (39%) were female. Malnutrition risk was significantly higher in males (p=0.029).

The comparing NRS-2002 screening and MNA scores tests results with hand grip test are given Table 2. There was a significant relationship between MNA-SF and MNA tests and Hand Grip test (p<0.001). However, there was no relation between NRS-2002 and Hand Grip test (p=0.511).

The relation between MNA and NRS 2002 tests with UAC and CC was given in Table 3. There was a significant relationship between MNA and NRS-2002 with the calf circumference (p<0.001 and p=0.004, respectively). There was also a significant relationship between MNA and NRS-2002 and upper arm circumference (p<0.001 and p=0.002, respectively).

When MNA and NRS-2002 test results were compared; malnutrition risk was found in 30 of 47 patients who were malnourished with MNA. Malnutrition risk was detected in 22 of 55 patients who were malnutrition risk with MNA. Malnutrition risk was found in 16 of 98 patients who were found to be normal according to MNA. There was a significant relationship between MNA test and NRS-2002 test results (p<0.001).

Table 1. Demographic datas by gender			
	Female (n=98)	Male (n=102)	p
Age	71.3 ± 8.1	70.9 ± 7.6	0.7
Weight (kg)	75.5 ± 16.6	77 ± 16.3	0.5
Height (cm)	158.1 ± 6.2	169.5 ± 7.5	<0.001
BMI (kg/m²)	30.2 ± 6.4	26.6 ± 5.8	<0.001
Upper arm circumference (cm)	28.6 ± 4.3	26.6 ± 3.4	<0.001
Calf circumference (cm)	32.1 ± 4.3	31.8 ± 4.9	0.7
Hand grip strength (kg)	14.7 ± 12.7	25 ± 16.5	<0.001
Number of drugs	9.38 ± 4.24	8.88 ± 4.3	0.4
Number of diseases	3.4 ± 1.5	3 ± 1.8	0.8
Number of falls	1.36 ± 2.2	0.53 ± 1.2	**0.001**
MNA-SF	9.8 ± 3.3	9.6 ± 3.3	0.6
MNA	17.6 ± 3.5	18.4 ± 5.3	0.3
NRS-2002	1.41 ± 1.54	1.99 ± 1.45	**0.007**
BMI: Body Mass index, MNA-SF: Mini Nutritional Assesment-short form, MNA: Mini Nutritional Assesment, NRS-2002: Nutritional Risc score 2002			

Table 2. The relationship between NRS-2002 and MNA test with hand grip strength				
		Hand Grip Strength		
		Low n (%)	Normal n (%)	Total	p
MNA	Malnutrition	22 (46.8%)	25 (53.2%)	47	<0.001
	Risk of malnutrition	20 (36.3%)	35 (63.7%)	55	
	Normal	16 (16.3%)	82 (83.7%)	98	
NRS-2002	Risk of malnutrition	22 (32.3%)	46 (67.7%)	68	0.511
	Normal	36 (27.2%)	96 (72.8%)	132	
MNA: Mini Nutritional Assesment, NRS-2002: Nutritional Risc score 2002				

The MNA was found to have a sensitivity of 82% and a specificity of 90%. MNA-SF was found to have a sensitivity of 83% and a specificity of 78%. The NRS-2002 test was found to have a sensitivity of 80% and a specificity of 83%. The positive predictive value of the NRS-2002 test was found to 0.83, and the MNA-SF was 0.82; the MNA test 0.90. The sensitivity and specificity analyses of MNA, MNA-SF and NRS-2002 tests were given at Table 4.

Discussion

Malnutrition is an important Geriatric syndrome which is seen in the high prevalence of geriatric population and causes serious morbidity and mortality. The meta analyse of Kaiser and et al. (10) which includes 24 studies and total 4507 patients from 12 countries found 31% and 5.8% malnutrition in the community. In our country, the risk of malnutrition on the geriatric policlinic was found 28% patients in the study of Ulger et al. and 31% in the study of Saka et al. (11,12). By the Academic Geriatrics Association planned "Turkey Nursing Homes and Nursing Homes Nutritional Status Assessment Project" examined 14 nursing homes/hospices. Project results found that malnutrition risk was 38.3% and malnutrition was 11.9% at nursing home/hospices (12). Malnutrition incidence was found 30-60% in hospitalized geriatric patients (13-15). In our study, the incidence of malnutrition and malnutrition are similar to other studies.

In our study, 53 of 253 patients were excluded due to non-compliance to the tests. This can be statistically misleading because the tests have been performed on selected patients. This allows us Screening tests can't use alone for the diagnosis of malnutrition and not be suitable for all inpatients. Therefore, clinical and laboratory evaluations should be used for diagnosis and evaluation of malnutrition. Similar to our study, 108 of 520 patients were excluded because of similar non-compliance to the tests in Kagansky's study (16).

According to MNA score results, mean BMI was 30.3±5.8 kg/m² patients with normal nutritional status, 28.3±6.4 in malnutrition risk and 24.4±5.9 in malnutrition (p<0.001). According to NRS-2002, these values were 29.5±6.4 in the patients with normal nutrition and 26.1±5.7 in the malnutrition risk group (p<0.001). In other words, as the BMI decreased, the risk of malnutrition and malnutrition increased.

Calf circumference measurement is a parameter that can show total muscle mass and physical function (17). Drescher et al. (18) found a significant relationship between MNA and NRS-2002 with CC measurement (p<0.0001 and p=0.001, respectively) and stated that they were a valid parameter in the detection of malnutrition. In our study, there was a significant correlation between MNA-SF, MNA and NRS-2002 with CC, (p<0.001, p<0.001, p=0.004). Therefore, CC measurement is an alone significant parameter in malnutrition screening.

Upper arm circumference measurement is a parameter that shows total body muscle ratio and physical function (19). Alert et al. (20) found a significant relationship between UAC and MNA. Also Cuervo et al. (21) found a significant relationship between MNA and UAC and stated that the UAC can be used in the screening of malnutrition. In our study, a significant relationship was found between MNA-SF, MNA and NRS-2002 with UAC (p<0.001, p<0.001, p=0.002). Thus the upper arm circumference is also an alone significant parameter in malnutrition screening.

Matos et al. (22) compared MNA with hand grip test, concluded that hand grip test can be used as a significant marker in the diagnosis of malnutrition. In our study, while there was a significant correlation between hand grip test and MNA-SF and MNA (p<0.001), no significant relationship was found with NRS-2002 (p=0.511). Therefore, the hand grip test can be used in malnutrition screening.

Table 4. The sensitivity and specificity analyses of MNA, MNA-SF and NRS-2002 tests

	Sensitivity	Specificity	Positive predictive value
MNA-SF	83%	78%	0.82
MNA	82%	90%	0.90
NRS-2002	80%	83%	0.83

MNA-SF: Mini Nutritional Assesment-short form, MNA: Mini Nutritional Assesment, NRS-2002: Nutritional Risc score 2002

Table 3. Relationship between MNA and NRS 2002 tests with UAC and CC

		UAC				CC			
		Low n(%)	Normal n(%)	Total	p	Low n(%)	Normal n(%)	Total	p
MNA	Malnutrition	25 (53.2%)	22 (46.8%)	47	<0.001	33 (70.2%)	14 (29.8%)	47	<0.001
	Risk of malnutrition	13 (23.6%)	42 (77.4%)	55		19 (34.5%)	36 (65.5%)	55	
	Normal	11(11.2%)	87 (88.8%)	98		29 (29.6%)	69 (69.4%)	98	
NRS-2002	Risk of malnutrition	26 (38.2%)	42 (61.8%)	68	0.002	37 (54.4%)	31 (45.6%)	68	0.004
	Normal	23 (17.4%)	109 (82.6%)	132		44 (33.3%)	88 (66.7%)	132	

UAC: Upper Arm Circumferences, CC: Calf circumference, MNA: Mini Nutritional Assesment, NRS-2002: Nutritional Risc score 2002

We compared the MNA-SF, MNA and the NRS-2002 Screening test in order to show the level of malnutrition which was tested by malnutrition screening. There was a significant correlation between MNA and MNA-SF and NRS-2002 Screening test results (p<0.001). In this case, both MNA-SF and MNA could be used as NRS-2002 in hospitalized patients. Similar results were also found in other study that MNA, NRS 2002 and Malnutrition Universal Screening Tool (MUST) tests were examined in relation with sarcopenia in the hospitalized patients. Patients were divided into two groups under 65 years of age and above and MNA was associated with sarcopenia in both groups (23).

The patients that results of MNA-SF diagnosed normal, malnutrition or malnutrition risk, MNA also received similar diagnoses as 82% sensitive, 100% selective and 100% positive predictive value.

In 22 of 55 patients who had malnutrition risk according to MNA, malnutrition risk was determined with NRS-2002. NRS-2002 accepted normal 33 patients (63%) as false normal.

NRS-2002 detected malnutrition risk in 16 (17%) of 98 patients who were found to be normal according to MNA. According to this, NRS-2002 was 80% sensitive, 83% specific and 83% positive predictive value.

Based on these comparisons, the MNA had a sensitivity of 82% and a specificity of 90%; The MNA-SF had a sensitivity of 83% and a specificity of 78%; The NRS-2002 test was found to have a sensitivity of 80% and a specificity of 83%. The positive predictive value of the NRS-2002 test was 0.83, and the MNA-SF was 0.82; The MNA was 0.90.

Neelemaat and et al. (24) study compared MNA-SF, NRS-2002, Malnutrition Screening Tool (MST), SNAQ and MUST Screening tests and no superiority was found between tests.

Similarly, in a study involving eight centers in China, MNA and NRS-2002 were compared with biochemical parameters and length of hospital stay. It has been shown that both tests can be used for malnutrition screening in inpatients and may be associated with length of stay (25).

In Drescher et al. (26) study were compared MNA and NRS-2002, reported that NRS-2002 was a Superior test for the detection of malnutrition in inpatients in geriatric clinic. MNA was found to be an independent predictor of survival in patients according to second generation anti-psychotic in a study of patients with heart failure. In the same study MNA-SF had the best sensitivity and specificity for screening malnutrition compared the MUST and MST (27). In the other study, MNA-SF, MUST and NRS 2002 were found adequate in assessing malnutrition in hip fracture operated elderly patients. In addition, MNA-SF predicted readmissions and mortality (28). In our study, the MNA was concluded to be superior to the other tests (82% sensitivity, 90% specificity).

As a result, it was determined that MNA and MNA-SF which are used in malnourished policlinic patients can be used in inpatients such as NRS 2002. More randomized controlled trials are needed to predict which test can be used for better malnutrition screening. At the same time we think that the hand grip strength and anthropometric measurements are reliable parameters malnutrition screening and evaluation.

Ethics

References

1. Jong N. Nutrition and senescence: Healthy aging for all in the new millennium. Nutrition. 2000;16:537-541.

2. Heinrich M, Prieto J. Will we globalise local knowledge systems? Ageing Research Reviews. 2007;7:249-274.

3. Lochs H, Allison SP, Meier R, Pirlich M, Kondrup J, Schneider S, van den Berghe G, Pichard C. Introductory to the ESPEN Guidelines on Enteral Nutrition: Terminology, definitions and general topics. Clin Nutr. 2006;25:180-186.

4. Smith AP. The concept of well-being: Relevance to nutrition research. Br. J. Nutr. 2005;93:1-5.

5. Ülger Z, Halil M, Kalan I, Yavuz BB, Cankurtaran M, Güngör E, Arioğul S. Comprehensive assessment of malnütrition risk and related factors in a large group of community-dwelling older adults. Clin Nutr. 2010;29:507-511.

6. Mitchell CO. Nutritional assessment of the elderly in: Geriatric nutrition the health professionals Handbook. 2nd edition, Aspen Publishers, Gaithersburg 1999, pp 382-415.

7. Abellan van Kan G. Epidemiology and consequences of sarcopenia. J. Nutr. Health Aging. 2009;13;708-712.

8. Cederholm T, Bosaeus I, Barazzoni R, Bauer J, Van Gossum A, Klek S, Muscaritoli M, Nyulasi I, Ockenga J, Schneider SM, de van der Schueren MA, Singer P. Diagnostic criteria for malnutrition - An ESPEN Consensus Statement. Clin Nutr. 2015;34:335-340.

9. CederholmT, JensenGL, Correia M, Gonzalez MC, Fukushima R, Higashiguchi T, Baptista G, Barazzoni R, Blaauw R, Coats A, Crivelli A, Evans DC, Gramlich L, Fuchs-Tarlovsky V, Keller H, Llido L, Malone A, Mogensen KM, Morley JE, Muscaritoli M, Nyulasi I, Pirlich M, Pisprasert V, de van der Schueren MAE, Siltharm S, Singer P, Tappenden K, Velasco N, Waitzberg D, Yamwong

P, Yu J, Van Gossum A, Compher C; GLIM Core Leadership Committee; GLIM Working Group. GLIM criteria for the diagnosis of malnutrition - A consensus report from the global clinical nutrition community. Clin Nutr. 2019;10:207-217.

10. Kaiser MJ, Bauer JM, Ramsch C, Uter W, Guigoz Y, Cederholm T, Thomas DR, Anthony PS, Charlton KE, Maggio M, Tsai AC, Vellas B, Sieber CC, for the Mini Nutritional Assessment International Group. Frequency of malnutrition in older adults: A multinational perspective using the mini nutritional assessment. J Am Geriatr Soc. 2010;58:1734-1738.

11. Chidester JC, Spangler AA. Fluid intake in the institutionalized elderly. J Am Diet Assoc. 1997;97:23-28.

12. Cankurtaran M, Saka B, Sahin S, Varlı M, Döventaş A, Yavuz BB, Halil M, Curgunlu A, Ulger Z, Tekin N, Akcicek F, Karan MA, Atlı T, Beger T, Erdinçler DS, Arıoğul S. Sarcopenia assessment project in the nursing homes in Turkey. Eur J Clin Nutr. 2014;68:690-694.

13. Kondrup J, Rasmussen HH, Hamberg O, Stanga Z; Ad Hoc ESPEN Working Group. Nutritional risk screening (NRS 2002): a new method based on an analysis of controlled clinical trials. Clin Nutr. 2003;22:321-236.

14. Poulia KA, Yannakoulia M, Karageorgou D, Gamaletsou M, Panagiotakos DB, Sipsas NV, Zampelas A. Evaluation of the efficacy of six nutritional screening tools to predict malnutrition in the elderly. Clin Nutr. 2012;31:378-385.

15. Kondrup J, Allison SP, Elia M, Vellas B, Plauth M. ESPEN guidelines for nutrition screening 2002. Clin Nutr. 2003;22:415-421.

16. Kagansky N, Berner Y, Koren-Morag N, Perelman L, Knobler H, Levy S. Poor nutritional habits are predictors of poor outcome in very old hospitalized patients. Am J Clin Nutr. October 2005;82:784-791.

17. Guigoz Y, Lauque S, Vellas BJ. Identifying the elderly at risk for malnutrition: The mini nutritional assessment. Clin Geriatr Med. 2002;18:737-757.

18. Drescher T, Singler K, Ulrich A, Koller M, Keller U, Christ-Crain M, Kressig RW. Comparison of two malnutrition risk screening methods and their association with markers of protein malnutrition in geriatric hospitalized patients. European Journal of Clinical Nutrition. 2010;64:887-893.

19. Elia M, Stroud M. Nutrition in acute care. Clin Med. 2004;4:405-407.

20. Alert PD, Villaroel MR, Casas VN, Farre VC. Assessing risk screening methods of malnutrition in geriatric patients; mini nutritional assessment versus geriatric nutritional risk index. Nutr Hosp. 2012;27:590-598.

21. Cuervo M, Ansorena D, García A, González Martínez MA, Astiasarán I, Martínez JA. Assessment of calf circumference as an indicator of the risk for hyponutrition in the elderly Nutr Hosp. 2009;24:63-67.

22. Matos LJ, Amaral TF. Handgrip strength as a hospital admission nutritional risk screening method. European Journal of Clinical Nutrition. 2007;61:1128-1135.

23. Yürüyen M, Yavuzer H, Yavuzer S, Cengiz M, Demirdağ F, Kara Z, AvcI S, Yurttaş N, İslamoğlu M, İmre E, Taşkın A, Döventaş A, Erdinçler U. Comparison of nutritional risk screening tools for predicting sarcopenia in hospitalized patients. Turkish Journal of Medical Sciences. 2017;47:1362-1369.

24. Neelemaat F, Meijers J, Kruizenga H, van Ballegooijen H, van Bokhorst-de van der Schueren M. Comparison of five malnutrition screening tools in one hospital inpatient sample. J Clin Nurs. 2011;20: 2144-2152.

25. Miao JP, Quan XQ, Zhang CT, Zhu H, Ye M, Shen LY, Guo QH, Zhu GY, Mei QJ, Wu YX, Li SG, Zhou HL. Comparison of two malnutrition risk screening tools with nutritional biochemical parameters, BMI and length of stay in Chinese geriatric inpatients: a multicenter, cross-sectional study. BMJ Open. 2019;9:e022993.

26. Drescher T, Singler K, Ulrich A, Koller M, Keller U, Christ-Crain M, Kressig RW. Comparison of two malnutrition risk screening methods (MNA and NRS 2002) and their association with markers of protein malnutrition in geriatric hospitalized patients. European Journal of Clinical Nutrition. 2010;64:887-893.

27. Joaquín C, Puig R, Gastelurrutia P, Lupón J, de Antonio M, Domingo M, Moliner P, Zamora E, Martin M, Alonso N, Puig-Domingo M, Bayes-Genis A. Mini nutritional assessment is a better predictor of mortality than subjective global assessment in heart failure out-patients. Clinical Nutrition. 2019;38:2740-2746.

28. Koren-Hakim T, Weiss A, Hershkovitz A, Otzrateni I, Anbar R, Gross Nevo RF, Schlesinger A, Frishman S, Salai M, Beloosesky Y. Comparing the adequacy of the MNA-SF, NRS-2002 and MUST nutritional tools in assessing malnutrition in hip fracture operated elderly patients. Clinical Nutrition. 2016;35:1053-1058.

Determination of Vitamin D, Vitamin B12 and Folic Acid Deficiency Prevalence Among Geriatric Palliative Care Patients

Ⓘ Eyüp Murat Efendioğlu[1], Ⓘ Mehmet Göl[2], Ⓘ Melek Sena Tarakçıoğlu[3], Ⓘ İbrahim Halil Türkbeyler[4], Ⓘ Zeynel Abidin Öztürk[5]

[1]Ersin Arslan Education and Research Hospital, Clinic of Internal Medicine, Gaziantep, Turkey
[2]Gaziantep University Faculty of Medicine, Department of Physiology, Gaziantep, Turkey
[3]Gaziantep University Faculty of Medicine, Department of Biochemistry, Gaziantep, Turkey
[4]Ersin Arslan Education and Research Hospital, Clinic of Internal Medicine, Division of Geriatric Medicine, Gaziantep, Turkey
[5]Gaziantep University Faculty of Medicine, Department of Internal Medicine, Division of Geriatric Medicine, Gaziantep, Turkey

Abstract

Objective: The more advanced age, the higher incidence and prevalence of chronic diseases. Both vitamin D and B12 deficiency are common health problems affecting geriatric patients. In this study, we aimed at determining the prevalence of vitamin D, B12 and folic acid deficiency among geriatric patients hospitalised in our palliative care clinic.

Materials and Methods: Records of geriatric patients hospitalised between August 2017 and August 2018 were analysed. A total of, 100 patients (53 female and 47 male) were included in the study.

Results: The mean age of the patients was 65.48±6.40 years. Five percent of the patients were diagnosed with vitamin D insufficiency, 86% with vitamin D deficiency; 32% and 62% had vitamin B12 and folic acid deficiency, respectively.

Conclusion: As it is the case throughout the world, vitamin D insufficiency/deficiency is common in Turkey. In our study, the prevalence of vitamin D, B12 and folic acid deficiency was determined to be high among geriatric palliative care patients. It is predicted that well-balanced nutrition along with vitamin D and B12 and folic acid supplementation can improve the quality of life of geriatric palliative care patients and their relatives.

Keywords: Vitamin D, vitamin B12, folic acid, palliative care

Introduction

"Palliativa" in Latin means inclusiveness and protectiveness. Palliative care is a nursing approach that aims at increasing the life quality of patients manifesting life-threatening and incurable diseases (1,2).

Vitamin D is a steroid hormone which has substantial importance to maintain calcium phosphorus balance and accordingly bone health (3,4). As in all age groups, vitamin D deficiency is critical problem for those, aged 65 and above. Vitamin D is substantial for physiological functioning of nervous, cardiovascular, respiratory and immune systems, maintenance of metabolism and healthiness of bones (5,6). Recently, several diseases have been found to be associated with vitamin D deficiency. For instance, Diabetes Mellitus, cancers and cardiovascular diseases are revealed to be allied with low vitamin D levels. Also, vitamin D deficiency undoubtedly paves the way for decreased muscle strength power, depression, functional disability, increased fall risk and fractures (7).

More or less one billion people throughout the world exhibit low vitamin D levels. Forty to 100% of U.S. and European community dweller elderly population have lower vitamin D levels than normal (8,9). Determination of vitamin D level is recommended in all elders (10).

Vitamin B12 is a water-soluble vitamin. Vitamin B12 deficiency prevalence varies between five and 60% in several studies. It is found to be lower in elders who are living socially active

Efendioğlu et al. Vitamin D, Vitamin B12 and Folic Acid Deficiency, Geriatric Palliative Care

Eur J Geriatr Gerontol 2020;2(1):9-12

(12%) and higher among elders with a kind of health problem or living in a nursing home (30 46-40%) (11). The aetiology vitamin B12 deficiency is compromised by mainly two factors. First one is inadequate intake in nutrition and the latter is reduced absorption through intestine. Vitamin B12 deficiency chiefly leads to cardiovascular diseases, neural tube defects and persistent or progressive pathologies of both central and peripherical nervous system, besides famous haematological disorders. It may cause psychiatric manifestations before hematologic or neurologic symptoms in geriatric age group. While hematologic symptoms regress in response to treatment, neurologic symptoms may remain to be unresolved (12).

Folate is also an important, soluble vitamin in B-complex group which cannot be synthesized in human body. Folate deficiency usually emerges from insufficient intake and prompts certain disorders to develop, such as megaloblastic anemia, major depression, cardiovascular diseases, Alzheimer's disease and increases the risk of some carcinomas. Symptoms, such as headache, weakness, fatigue, irritability, being unable to concentrate, shortness of breath and palpitation can be experienced in case of folate deficiency, as well (13-15). According to "Turkey Nutrition and Health Survey 2010", folate intake is definitely lower than assumed optimal amount among individuals between the age of 15 and 17 and women aged 65 and above in comparison to other age groups (16).

The purpose of this study is to determine the prevalence of vitamin D, B12 and folate deficiencies among geriatric palliative care patients.

Materials and Methods

This is a cross-sectional and retrospective study. The medical file and electronic records of geriatric patients hospitalised for one year, since 1st of August 2017 till 1st of August 2018, were analysed. Totally, 100 patients, 53 of whom were women and 47 were men, included in the study. Diagnoses of the patients were registered. Vitamin D, B12 and folate levels of the patients were reached by using the laboratory results in records. Vitamin D deficiency was defined by serum 25 (OH) D level less than 20 ng/mL (<20 ng/mL) whereas vitamin D insufficiency was referred to the 25 (OH) D level varying between 21 and 29ng/mL (≥21 ng/mL, ≤29 ng/mL) (8). Vitamin B12 levels lower than 200 pg/mL were accepted as vitamin B12 deficiency. Folic acid deficiency was identified when the level was lower than 4.6 ng/Ml (17).

Statistics

After conducting questionnaires, the data acquired was recorded into the SPSS 20.0 (Statistical Package for Social Sciences) software and analysed. As all groups formed for analysis provided a pile of continues variables with normal distribution, all descriptive statistics were defined as mean ± standard deviation.

Results

The mean age of the patients was 65.48±6.40. 47% of total were men (47 individuals) and 53% were, women (53 individuals). The lower limits of normal range for vitamin D, B12 and folic acid were verified as 30 ng/mL, 200 pg/mL and 4.6 nmol/L, respectively. While 5% of the patients (5 individuals) were diagnosed with vitamin D insufficiency, 86% (86 individuals) were diagnosed as vitamin D deficient. 32% (32) of the patients exhibited B12 deficiency and 62% (62) folate deficiency. Among all patients in our palliative care patients, 21% had been hospitalized due to malignancy, 16% due to cerebrovascular diseases, and 16% due to decubitus ulcer, 14% due to neurodegenerative diseases (dementia or Parkinson's disease or both), 12% due to Diabetes Mellitus, 12% due to chronic lung diseases and 9% due to heart failure (Table 1).

Discussion

Over the past century, the improvement of living conditions, technology and science as well an increase in the elderly population has continued. Every patient has the right to spend the last days of life in a certain quality and peace of mind. Palliative care is therefore considered among human rights values today. In this study, the levels of vitamin D, Vitamin B12 and folic acid were retrospectively examined in geriatric patients in the palliative care unit of our hospital. Our study is important because it is the first study to investigate the levels of vitamin D, Vitamin B12 and folic acid in geriatric patients in palliative care in our country. As a result of our study; 5% of the patients were diagnosed with vitamin D insufficiency; 86% were diagnosed as vitamin D deficiency. 32% and 62% exhibited vitamin B12 and folic acid deficiencies, respectively.

Table 1. Features of the geriatric palliative care patients	
Total of patients, n	**100**
Age, mean (SD)	65.48 (6.40)
Women/men, %	53/47
Diagnosis, % Malignancy Decubitus ulcer Cerebrovascular diseases Dementia Diabetes Mellitus type II Chronic obstructive lung disease Heart failure	21 16 16 14 12 12 9
Vitamin D level, mean (SD)	12.64±11.12
Vitamin D insufficiency prevalence %	5
Vitamin D deficiency prevalence %	86
Vitamin B12 level, mean (SD)	346.148±224.934
Vitamin B12 deficiency prevalence	32%
Folic acid level, mean (SD)	5.57±3.51
Vitamin folic acid deficiency prevalence %	62
SD: Standard deviation, n: Number of the patients	

Vitamin D insufficiency/deficiency is common both in Turkey and throughout the world. Relationship between vitamin D levels and fractures is extraordinarily an object of curiosity (18). On the other hand, some brand-new roles have been provided for vitamin D. For instance, Vitamin D is also proposed to restore mitochondrial dysfunction and alleviate oxidative stress and inflammation. Thus, even a hypothesis based upon vitamin D deficiency/insufficiency and ageing coupling is brought forward (19). There also seems to be an inverse correlation between 25 (OH) D level and both type I and II Diabetes Mellitus (20). Some observational studies indicate that vitamin D insufficiency/deficiency may contribute to pathological basis of cardiovascular risk factors such as hypertension, hyperlipidaemias and obesity and certain diseases such as ischemic heart diseases and stroke (21). With all these diseases, chronic pain patients can also admit to clinics as having a low in vitamin D alone (22).

A recent study in England uncovers that 50% of adult population have vitamin D insufficiency whilst 16% purely have vitamin D deficiency (23). Among women aged 80 or above, vitamin D insufficiency/deficiency is found to be presented with a high prevalence, up to 80% as much. Even among healthy adolescents the prevalence is to found to be approaching as a high value as 42% (24). There are only a few studies displaying vitamin D status of elderly individuals in Turkey. In one of them, 33.4% of elderly individuals are detected to be vitamin D deficient (25). We also reached a high prevalence of vitamin D deficiency among both adult and elderly Turkish population in the south-eastern part of Turkey, as high as 75% (<20 ng/mL), in one of our previous studies. (26). In our study, 5% of geriatric palliative care patients displayed insufficiency and 86% were strictly vitamin D deficient. In our study, it was concluded that the reason for the relatively high incidence of vitamin D deficiency in palliative care patients was due to high malnutrition, immobility, and inability to benefit from the sun in palliative care patients.

Increased oxidative stress, risk of fracture, chronic pain, Diabetes Mellitus and cardiovascular disease prevalence are associated with vitamin D deficiency in palliative care, so screening of vitamin D levels in geriatric patients and supplementation if it is below acceptable range would have a very plausibly low cost if we consider benefits of patients exhibiting before mentioned diseases.

The metabolisms of folic acid and vitamin B12 intersect during the transfer of the methyl group from five-methyltetrahydrofolate to homocysteine catalyzed by B12-dependent methionine synthase. Vitamin B12 and folic deficiencies mostly arise from malabsorption. Vitamin B12 and folic deficiencies are commonly seen in elders because of both dietary inadequacy and high incidence of atrophic gastritis (27-29).

Folate and/or vitamin B12 deficiency may have additive effects in many diseases including, anemia, weakness and confusion, memory deficits, shortness of breath, peripheral neuropathy, pregnancy complications, depression, cardiovascular diseases, stroke, myelopathy, sensory and motor disturbances, ataxia, cognitive decline leading to dementia, malignancies, and psychiatric disorders (17,28).

There are only a few studies displaying, vitamin B12 and folate status of elderly individuals in Turkey. Yıldırım and colleagues revealed that 62.2% of elders aged between 60 and 74, 72.2% of elders aged between 75 and 84 and 50% of elders aged 85 and above are diagnosed as B12 deficient. Also, they declared that 10.4% of elders aged between 60 and 74, 12.2% of elders aged between 75 and 84 and 20% of elders aged 85 and above are diagnosed with folate deficiency (30). In our study, 32% and 62% exhibited vitamin B12 and folic acid deficiencies, respectively. In our study, it was concluded that the reason for the relatively high incidence of vitamin B12 and folic acid in palliative care patients was due to high malnutrition.

Several limitations of the current study need to be discussed. The main limitations of our study are as follows: the retrospective character of the study was one of leading limiting aspect. It should be supported by prospective studies. Also, our study consisted of data obtained from a single center. Moreover, for folic acid, vitamin B12 and vitamin D, only the first laboratory values of the patient's hospital intake assessment were considered. Detailed evaluation of folic acid, vitamin B12 and vitamin D status of geriatric patients in palliative care hospitalization is important and the results of prospective studies may be guiding.

Conclusion

We found that vitamin D, folic acid and vitamin B12 deficiencies were high in elderly patients hospitalized in palliative care. In consideration of increased risk and frequency of fracture, psychiatric disease, dementia, falls, cardiovascular diseases, stroke, anemia, chronic fatigue, malignancy in elderly patients in palliative care; screening and reducing vitamin D, folic acid and vitamin B12 deficiencies will be a step that does not require much cost but has a high return on the quality of life of patients in palliative care.

Ethics

Ethics Committee Approval: Approval was obtained from Gaziantep University Local Ethics Committee (01.08.2018/2018/203).

Informed Consent: Informed consent was not taken.

Peer-review: Internally peer-reviewed.

Efendioğlu et al. Vitamin D, Vitamin B12 and Folic Acid Deficiency, Geriatric Palliative Care

Eur J Geriatr Gerontol 2020;2(1):9-12

Authorship Contributions

Concept: İ.H.T., Design: Z.A.Ö., Data Collection or Processing: E.M.E., Analysis or Interpretation: İ.H.T., Literature Search: M.G., Writing: M.S.T.

References

1. Lorenz KA, Lynn J, Dy SM, Shugarman LR, Wilkinson A, Mularski RA, Morton SC, Hughes RG, Hilton LK, Maglione M, Rhodes SL, Rolon C, Sun VC, Shekelle PG. Evidence for improving palliative care at the end of life: a systematic review. Ann Intern Med 2008;148:147-159.

2. Sepulveda C, Marlin A, Yoshida T, Ullrich A. Palliative Care: the World Health 197 Organization's global perspective. Journal of pain and symptom management 2002;24:91-96.

3. Holick MF. Vitamin D deficiency in 2010: health benefits of vitamin D and sunlight: a 200 D-bate. Nature reviews Endocrinology 2011;7:73-75.

4. Holick MF, Binkley NC, Bischoff-Ferrari HA, Gordon CM, Hanley DA, Heaney RP, Murad MH, Weaver CM; Endocrine Society. Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society 203 clinical practice guideline. The Journal of clinical endocrinology and metabolism 2011;96:1911-1930.

5. MacLaughlin J, Holick MF. Aging decreases the capacity of human skin to produce 206 vitamin D3. The Journal of clinical investigation 1985;76:1536-1538.

6. Boucher BJ. The problems of vitamin d insufficiency in older people. Aging and 208 disease 2012;3:313-329.

7. Gerdhem P, Ringsberg KA, Obrant KJ, Akesson K. Association between 25-hydroxy 210 vitamin D levels, physical activity, muscle strength and fractures in the prospective 211 population-based OPRA Study of Elderly Women. Osteoporosis 2005;16:1425-1431.

8. Holick MF. Vitamin D deficiency. The New England journal of medicine 2007;357:266-281.

9. Holick MF. Vitamin D: important for prevention of osteoporosis, cardiovascular heart 217 disease, type 1 diabetes, autoimmune diseases, and some cancers. Southern medical journal 2005;98:1024-1027.

10. Mursu J, Robien K, Harnack LJ, Park K, Jacobs DR, Jr. Dietary supplements and 220 mortality rate in older women: the Iowa Women's Health Study. Arch Intern Med 2011;171:1625-1633.

11. Andrés E, Loukili NH, Noel E, Kaltenbach G, Abdelgheni MB, Perrin AE, Noblet-Dick M, Maloisel F, Schlienger JL, Blicklé JF. 223 Vitamin B12 (cobalamin) deficiency in elderly patients. CMAJ 2004;171:251-259.

12. Serefhanoglu S, Aydogdu I, Kekilli E, Ilhan A, Kuku I. Measuring holotranscobalamin 226 II, an early indicator of negative vitamin B12 balance, by radioimmunoassay in patients with 227 ischemic cerebrovascular disease. Annals of hematology 2008;87:391-395.

13. Gropper SS, Smith JL. Water-Soluble Vitamins. Advanced Nutrition and Human 229 Metabolism. 6th ed. Yolanda Cossio, 2013, pp 307-371.

14. Reynolds EH. Folic acid, ageing, depression, and dementia. Bmj 2002;324:1512-1515.

15. Ford ES, Byers TE, Giles WH. Serum folate and chronic disease risk: findings from a 233 cohort of United States adults. International journal of epidemiology 1998;27:592-598.

16. Pekcan GA, Şanlıer N, Baş M, Başoğlu S, Tek NA, Aksoy M, Başoğlu S, Beyhan Y, Garipağaoğlu M, Özçelik AÖ, Tayfur M, Yıldıran H. Türkiye Beslenme 235 Rehberi (TÜBER) Kayhan Ajans; 2016.

17. Blom HJ, Smulders Y. Overview of homocysteine and folate metabolism. With special 237 references to cardiovascular disease and neural tube defects. Journal of inherited metabolic disease 2011;34:75-81.

18. Group D. Patient level pooled analysis of 68 500 patients from seven major vitamin D 240 fracture trials in US and Europe. Bmj 2010;340:b5463.

19. Berridge MJ. Vitamin D deficiency accelerates ageing and age-related diseases: a novel hypothesis. The Journal of physiology 2017;595:6825-6836.

20. Takiishi T, Gysemans C, Bouillon R, Mathieu C. Vitamin D and diabetes. Rheumatic 244 diseases clinics of North America 2012;38:179-206.

21. Skaaby T, Thuesen BH, Linneberg A. Vitamin D, Cardiovascular Disease and Risk 246 Factors. Advances in experimental medicine and biology 2017;996:221-320.

22. Cannell JJ, Hollis BW, Zasloff M, Heaney RP. Diagnosis and treatment of vitamin D 248 deficiency. Expert Opin. Pharmacother 2008;9:107-118.

23. Pearce SH, Cheetham TD. Diagnosis and management of vitamin D deficiency. Bmj 2010;340:b5664.

24. Bandeira F, Griz L, Dreyer P, Eufrazino C, Bandeira C, Freese E. Vitamin D 252 deficiency: A global perspective. Arquivos brasileiros de endocrinologia e metabologia 2006;50:640-646.

25. Atli T, Gullu S, Uysal AR, Erdogan G. The prevalence of Vitamin D deficiency and 255 effects of ultraviolet light on Vitamin D levels in elderly Turkish population. Arch Gerontol Geriatr 2005;40:53-60.

26. Öztürk ZA, Gol M, Türkbeyler IH. Prevalence of vitamin D deficiency in otherwise 258 healthy individuals between the ages of 18 and 90 years in southeast Turkey. Wien Klin 259 Wochenschr 2017;129:854-855.

27. Dietary supplement fact sheet. Folate. Health Information. Office of Dietary 261 Supplements. US National Institutes of Health, 2014.

28. Weinstein SJ, Hartman TJ, Stolzenberg-Solomon R, Pietinen P, Barrett MJ, Taylor PR, Virtamo J, Albanes D. Null association between prostate cancer and serum folate, vitamin B(6), vitamin 264 B(12), and homocysteine. Cancer Epidemiol Biomarkers Prev 2003;12:1271-1272.

29. Botez MI. Folate deficiency and neurological disorders in adults. Med Hypotheses 1976;2:135-140.

30. Yildirim T, Yalcin A, Atmis V, Cengiz OK, Aras S, Varli M, Atli T. The prevalence of 268 anemia, iron, vitamin B12, and folic acid deficiencies in community dwelling elderly in 269 Ankara, Turkey. Archives of gerontology and geriatrics 2015;60:344-348.

ORIGINAL RESEARCH

The Effects and Characteristics of Musculoskeletal Pain on Quality of Life in Geriatric Patients

⬤ Nilay Şahin[1], ⬤ Gül Devrimsel[2], ⬤ Ali Yavuz Karahan[3], ⬤ Serdar Sargın[4]

[1]Balıkesir University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Balıkesir, Turkey
[2]Recep Tayyip Erdoğan University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Rize, Turkey
[3]Uşak University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Uşak, Turkey
[4]Balıkesir University Faculty of Medicine, Department of Orthopaedic and Traumatology, Balıkesir, Turkey

Abstract

Objective: This study aimed to is to compare the pain levels, quality of life, and depression levels of geriatric patients and non-geriatric patients due to musculoskeletal pain.

Materials and Methods: 300 GP and 250 NGP were included in this cross-sectional study. The inclusion criteria were as follows: patients aged between 18-90 years, those suffering from musculoskeletal pain, and those with a pain severity between 2 and 8 points agreed to participate in the study. Visual pain scale (VPS) was used for the assessment of pain severity. The quality of life was assessed by Short form-36 (SF-36). The Beck depression scale (BDS) was used to assess depression status.

Results: In the GP group, the prevalence of additional comorbidities, frequency of drug use, and the number of painful sites in the musculoskeletal system were more frequent from those of the NGP group (p<0.05 for all). Myofascial pain syndrome and fibromyalgia syndrome were significantly more frequent in the NGP group (p<0.05 for both). There were statistically significant differences in the physical role, pain, social, energy, and mental status subgroup scores of the VPS, SF-36, and BDS in the GP group compared to the NGP group (p<0.05 for all).

Conclusion: This cross-sectional study suggests that musculoskeletal problems are becoming increasingly considerable that can significantly impact the quality of life in the geriatric population at the end of life. Obtained results highlight the high prevalence and severity of musculoskeletal symptoms that were assimilated into a patient's daily life.

Keywords: Musculoskeletal pain, quality of life, geriatric, depression

Introduction

Aging is a natural process expected for the individual, and the reserve capacities of organs and their ability to adapt to environmental factors reduce with aging (1). Like all organs during this period, there are also changes in the musculoskeletal system. Musculoskeletal system disorders such as osteoporosis, chronic back pain, osteoarthritis, fibromyalgia, Myofascial Pain syndrome, tendinitis, and epicondylitis are commonly encountered in the elderly (2-4). Chronic musculoskeletal pain is prevalent, and disability occurs in at least one-quarter of the elderly (5,6). It is crucial for an elderly individual to be independent at home and in society and to assess their functional capacity (7). Cartilage degeneration, decrease in total muscle mass, and reduction in functional mobility are seen with aging. On the other hand, the quality of life deteriorates in the elderly population (8,9).

This study aimed to is to compare the pain levels, quality of life, and depression levels of geriatric patients (GP) and non-geriatric patients (NGP) due to musculoskeletal pain.

Materials and Methods

Three hundred GP (65-90 age) and 250 NGP who admitted

Cite this article as: Şahin N, Devrimsel G, Karahan AY, Sargın S. The Effects and Characteristics of Musculoskeletal Pain on Quality of Life in Geriatric Patients. Eur J Geriatr Gerontol 2020;2(1):13-17

to physical therapy and rehabilitation outpatient clinic were included in this cross-sectional study. The demographic characteristics, functional status, and emotional status of the participants were questioned. The Institutional Review Board of Selçuk University approved this study (2011-022).

The inclusion criteria were as follows: patients aged between 18-90 years, those suffering from musculoskeletal pain, those with a pain severity between two and eight points (on a Visual Analog scale of 10 cm), and agreed to participate in the study. Musculoskeletal system pain was evaluated according to anamnesis and physical examination, and patients were included accordingly. The definition of musculoskeletal pain is; it is a pain that patients feel in their joints, ligaments, tendons, and muscles, and there are physical examination findings for these areas (10,11).

Patients who were heavy bodyworkers, those with uncontrolled chronic disease (hypertension, Diabetes Mellitus, atrial fibrillation, renal insufficiency, multiple sclerosis), with a history of musculoskeletal surgery for any reason and those with any malignancy either in remission or not were excluded from the study.

Visual Pain scale (VPS) was used for the assessment of pain severity. On the VPS, there are numbers placed from zero to 10 on a 10 cm line. No pain is scored as zero; the most severe pain ever felt is 10 (12). The patient was asked to mark the severity of the general body pain on this line.

The quality of life was assessed by Short form-36 (SF-36). The SF-36 is a questionnaire consisting of 8 sub-groups and a total of 36-question to measure the overall quality of life. It is filled in by the patient him/herself. SF-36 has eight subfields: general health, physical function, physical role, pain, vitality, social function, emotional role, and mental health. The total score ranges from 0-to-100. Zero reports the worst health condition, 100 reports the best condition. The validity and reliability of the Turkish version were done (13,14).

The Beck depression scale (BDS) was used to assess depression status. In adults, this is a self-assessment scale developed to measure the risk of depression, the severity of depressive symptoms, and change in intensity. It is a measure that consists of 21-questions developed to determine the depression level of the patients. Each question is scored from zero to three points in an increasing manner, and the total score ranges between zero and 63 (15). The higher total score indicates severe depression. The validity and reliability studies in our country were conducted by Hisli (16).

Statistics

The SPSS for Windows 11.0 software package (Chicago, IL) was used for the statistical evaluation of the data. The conformity of continuous variables with normal distribution was investigated using the Kolmogorov-Smirnov test. All variables were distributed normally. Descriptive data were presented as a mean $\pm$ standard deviation. Demographic and clinical characteristics were compared using the chi-square test. Within-group and between-group differences were investigated. The independent samples test was used to compare the two groups. The paired-samples t-test was used to analyze the differences between the baseline and after treatment values. A p-value of less than 0.05 was considered statistically significant.

Results

The mean age of the GP group is 70.26±4.81 years, and the mean age of NGP is 32.94±10.81 years. The male-to-female ratio was 39% - 61% in the GP group, while it was 26% - 74% in the NGP group (Table 1). In the GP group, the prevalence of additional comorbidities, frequency of drug use, and the number of painful sites in the musculoskeletal system were significantly higher than those of the NGP group (p<0.05 for all). Myofascial pain syndrome and fibromyalgia syndrome were significantly more

Table 1. Baseline characteristics of individuals in the geriatric and non-geriatric groups

	GP (n=300)	NGP (n=250)	p
Age (Mean $\pm$ SD)	70.26±4.81*	32.94±10.81	<0.001
Gender (%)			
Male	38.9	25.8	-
Female	61.1	74.2	-
BMI (kg/m²) (Mean $\pm$ SD)	30.1±2.9	28.9±2.6	-
Comorbid conditions n (%)			<0.001
Hypertension	132 (44)	15 (6)	-
Diabetes	96 (32)	12 (4.8)	-
Anxiety and/or depression	93 (31)	45 (18)	-
Cerebrovascular disease	58 (19.3)	2 (0.8)	-
COPD	68 (22.6)	8 (3.2)	-
Renal disease	51 (17)	5 (2)	-
Liver disease	38 (12.6)	5 (2)	-
Frequency of falls	102 (34)	3 (1.2)	<0.001

*: p<0.001, statistical significance, GP: Geriatric patients, NGP: Non-geriatric patients, BMI: Body Mass index, COPD: Chronic obstructive pulmonary disease, SD: Standart deviation, n: Number of the patients

Table 2. Musculoskeletal disorders

	GP (n=300)	NGP (n=250)	p
Fibromyalgia (%)	9.3	19.3*	<0.001
Myofascial Pain syndrome (%)	47.5	62.9*	<0.001

*p<0.001, GP: Geriatric patients, NGP: Non-geriatric patients, n: Number of the patients

frequent in the NGP group (p<0.05 for both) (Table 2). There were statistically significant differences in the physical role, pain, social, energy, and mental status subgroup scores of the VPS, SF-36, and BDS in the GP group compared to the NGP group (p<0.05 for all) (Table 3,4).

Table 3. Visual Pain scale and Beck Depression scale

VPS and BDS	GP (n=300)	NGP (n=250)	p
VPS			
At rest	4.27±1.89	3.85±2.72	-
At exercise	6.28±1.76*	5.24±2.71	<0.001
At night	4.45±2.66*	2.50±3.05	<0.001
BDS	15.56±7.36*	14.14±10.05	<0.001

GP: Geriatric patients, NGP: Non-geriatric patients, VPS: Visual pain scale, BDS: Beck Depression scale, *p<0.001

Table 4. Short form-36 quality of life questionnaire scoring

SF-36	GP (n=300)	NGP (n=250)	p
Physical functioning	69.06±50.47	69.24±26.17	-
Role limitations due to physical health	25.54±36.87*	48.55±42.58	<0.001
Pain	49.72±15.26**	45.45±19.48	<0.05
General health	50.83±19.36	53.61±14.37	-
Energy	38.81±18.18*	48.60±13.77	<0.001
Social functioning	41.17±19.61*	46.91±16.70	<0.001
Role limitations due to emotional problems	47.84±46.16	50.18±42.37	-
Emotional well-being	55.52±19.50*	43.05±15.29	<0.001

GP: Geriatric patients, NGP: Non-geriatric patients, *p<0.001, **p<0.05, SF-36: Short form-36

Discussion

Aging is the most important factor that leads to a decrease in quality of life relevant to biological, social, and psychological dimensions. Chronic diseases and disability are more common in GP than in other age groups (17,18). The level of activity is restricted by disability at the geriatric age (19,20). Restriction in daily life activities harms the quality of life. In previous studies, aging has been found to hurt the quality of life (21,22). On the other hand, another study reported that there was no relationship between age and quality of life and that there was a decrease in quality of life due to additional factors in the elderly (1). In our study, we found that the physical role of life quality, pain, social, energy, and mental status parameters were more negatively affected in the GP group.

The prevalence of pain in the geriatric population is seen in 18-57% (23) and has an important place in health expenditures (24). In a previous study, it was found that musculoskeletal pain is common in the elderly and that the quality of life is lower in elder people suffering from pain (25). It has also been reported that elderly women have lower quality of life who stay in nursing homes and have chronic musculoskeletal pain (26). Brown et al. (27) found that in the geriatric population more than 90% of the elderly experience pain. It has also been observed that the frequency of pain complaint increases in the elderly who are at the last period of their lives (28). However, Woo et al. (29) reported that the prevalence of musculoskeletal pain does not change after 70 years of age, while Bergman et al. (30) reported a decrease in the frequency of pain complaint after age 65 years. In our study, the prevalence of pain in elderly individuals was found to be high.

Soft tissue problems are common due to physiological changes in the geriatric period (31). Fibromyalgia, rotator cuff rupture, adhesive capsulitis and Compression syndrome are common soft tissue problems (32). A previous study has reported that myofascial pain syndrome takes place as the second among the most common causes of soft tissue problems (2). However, in our study, we found that soft tissue pathologies were more frequent in the NGP group.

Chronic musculoskeletal pain in elderly patients is a frequent geriatric consultation and admission cause, and opioid and non-opioid analgesics are widely used in the treatment. On the other hand, with increasing drug use, problems such as drug side effects and increased drug costs arise (33,34). One previous study has reported that systemic pathologies are more frequently encountered in the elderly population (2). In our study, we found that analgesic medication was used more commonly in the GP group, and thyroid disease, Diabetes Mellitus, hypertension, and cardiovascular system disease were more frequently observed.

Falls are one of the major causes of death in geriatric populations and results in an increase in health expenditures (35). There is a reduction in the strength of tendons and ligaments by aging and this causes increase in joint laxity (9). 25-55% of the geriatric population has fear of falling, therefore they restrict their activities. Skeletal muscle pain and activity restriction may cause further weakness in the muscles (36,37). It was found that there were more falls in patients with chronic pain (38). Environmental factors and musculoskeletal disorders have an adverse effect on balance (39,40). In our study, we found that the frequency of falls was higher in the GP group.

Depression is common in the geriatric population (41). Pain is a significant risk factor for depression. Miu et al. (42) have reported that depression is more common in elders suffering from pain. İlhan et al. (43) found the frequency of depression as 48.2% among the elderly living in nursing homes. In another study, it was reported that this ratio was 41% (44,45). In our study, we found that depression is more common in the geriatric population.

With aging, the number of additional illnesses and associated drug use, risk of falls, pain intensity, and the number of painful areas in the musculoskeletal system increase significantly. Despite the increase in the number of painful sites, the prevalence of soft-tissue rheumatism is lower in elderly patients. Depression is more common in the elderly as a reflection of age-related complaints and complaints of pain, and the quality of life is deteriorating.

Limitations of the Study

Although the sample size was calculated before the study, the number of patients whose results were evaluated can be considered low.

Conclusion

This cross-sectional study suggests that musculoskeletal problems are becoming increasingly considerable that can significantly impact the quality of life in the geriatric population at the end of life. Obtained results highlight the high prevalence and severity of musculoskeletal symptoms that were assimilated into a patient's daily life. Antecedence for further studies include qualitative research, should provide evidence-based treatment models for musculoskeletal pain-related patient priorities.

Ethics

Ethics Committee Approval: The study was approved by the ethics committee of Selçuk University (2011/022).

Informed Consent: Informed consent was obtained.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Consept: G.D., Design: N.Ş., A.Y.K., Data Collection and/or Processing: N.Ş., A.Y.K., S.S., Analysis and/or Interpretation: G.D., A.Y.K., Literature Research: N.Ş., A.Y.K., S.S., Writing: S.S., G.D.

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

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Akyol Y, Durmuş D, Doğan C, Bek Y, Cantürk F. Quality of life and level of depressive symptoms in the geriatric population. Archives of Rheumatology. 2010;25:165-173.

2. Çakmak B, Aydın F, Aktaş İ, Akgün K, Eryavuz M. Geriatrik hastalarda kas-iskelet sistemi hastalıkları. Türk Geriatri Dergisi. 2004;7:221-224.

3. Seçkin Ü, Borman P, Bodur H. Fizik tedavi ve rehabilitasyon polikliniğine başvuran yaşlıların tanısal dağılımı. Turkish Journal of Geriatrics. 1999;2:57-60.

4. Yoo, Hyung J. Geriatric Diseases and Medical Service for the Aged in Korea. J Korean Geriatr Soc. 1997;1:6-11.

5. Podichetty VK, Mazanec DJ, Biscup RS. Chronic non-malignant musculoskeletal pain in older adults: clinical issues and opioid intervention. Postgrad Med J. 2003;79:627-633.

6. Frondini C, Lanfranchi G, Minardi M, Cucinotta D. Affective, behavior and cognitive disorders in the elderly with chronic musculoskelatal pain: the impact on an aging population. Arch Gerontol Geriatr. 2007;44:167-171.

7. Muszalik M, Kornatowski T, Zielinska-Wieczkowska H, Kedziora-Kornatowska K, Dijkstra A. Functional assessment of geriatric patients in regard to health-related quality of life (HRQoL). Clin Interv Aging. 2015;10:61-67.

8. Creamer P, Flores R, Hochberg MC. Management of osteoarthritis in older adults. Clin Geriatr Med. 1998;14:435-54.

9. Loeser RF, Jr. Aging and the etiopathogenesis and treatment of osteoarthritis. Rheum Dis Clin North Am. 2000;26:547-567.

10. Arendt-Nielsen L, Fernandez-de-Las-Penas C, Graven-Nielsen T. Basic aspects of musculoskeletal pain: from acute to chronic pain. J Man Manip Ther. 2011;19:186-193.

11. Dieppe P. Chronic musculoskeletal pain. BMJ. 2013;346:f3146.

12. Wewers ME, Lowe NK. A critical review of visual analogue scales in the measurement of clinical phenomena. Res Nurs Health. 1990;13:227-236.

13. Koçyiğit H, Aydemir Ö, Ölmez N, Memiş A. Kısa form-36 (KF-36)'nın Türkçe versiyonunun güvenilirliği ve geçerliliği. Ilaç ve tedavi dergisi. 1999;12:102-106.

14. Ware JE, Jr., Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care. 1992;30:473-483.

15. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry. 1961;4:561-571.

16. Hisli N. Beck Depresyon Envanterinin Geçerliği Üzerine Bir Çalışma. Turkish Journal of Psychology. 1988;6:118-126.

17. The World Health Organization Quality of Life Assessment (WHOQOL): development and general psychometric properties. Soc Sci Med. 1998;46:1569-1585.

18. de Haes JC, van Knippenberg FC. The quality of life of cancer patients: a review of the literature. Soc Sci Med. 1985;20:809-817.

19. Bränholm I, Eklund M, Fugl-Meyer KS, Fugl-Meyer AR. On work and life satisfaction. J Rehabil Sci. 1991;4:29-34.

20. van Campen C, Iedema J. Are persons with physical disabilities who participate in society healthier and happier? Structural equation modelling of objective participation and subjective well-being. Qual Life Res. 2007;16:635-645.

21. Skevington SM, Lotfy M, O'Connell KA, WHOQOL Group. The World Health Organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. A report from the WHOQOL group. Quality of life Research. 2004;13:299-310.

22. Arslantaş D, Metintaş S, Ünsal A, Kalyoncu C. Eskişehir Mahmudiye ilçesi yaşlılarında yaşam kalitesi. Osmangazi Tıp Dergisi. 2006;28:81-89.

23. Harris L. Review of prevalence of pain in older adults. MMedSci Thesis: Keele University, 2004.

24. Yelin E, Herrndorf A, Trupin L, Sonneborn D. A national study of medical care expenditures for musculoskeletal conditions: the impact of health insurance and managed care. Arthritis Rheum. 2001;44:1160-1169.

25. Nouhi E, MehdipourRabari R, Abasszadeh A. Effect of intensity and location of local musculoskeletal pain on quality of life in elderly, Kerman, Iran. Bimonthly Journal of Hormozgan University of Medical Sciences. 2012;15:e88507.

26. Lee SH, Yang SO. The effects of chronic musculoskeletal pain and depression on health-related quality of life by gender in community-dwelling older adults. Journal of Korean Academy of Community Health Nursing. 2010;21:21-30.

27. Brown ST, Kirkpatrick MK, Swanson MS, McKenzie IL. Pain experience of the elderly. Pain Manag Nurs. 2011;12:190-196.

28. Smith AK, Cenzer IS, Knight SJ, Puntillo KA, Widera E, Williams BA, Boscardin WJ, Covinsky KE. The epidemiology of pain during the last 2 years of life. Ann Intern Med. 2010;153:563-539.

29. Woo J, Ho SC, Lau J, Leung PC. Musculoskeletal complaints and associated consequences in elderly Chinese aged 70 years and over. J Rheumatol. 1994;21:1927-1931.

30. Bergman S, Herrstrom P, Hogstrom K, Petersson IF, Svensson B, Jacobsson LT. Chronic musculoskeletal pain, prevalence rates, and sociodemographic associations in a Swedish population study. J Rheumatol. 2001;28:1369-1377.

31. Holland NW, Gonzalez EB. Soft tissue problems in older adults. Clinics in geriatric medicine. 1998;14:601-612.

32. Gowin KM. Diffuse pain syndromes in the elderly. Rheum Dis Clin North Am. 2000;26:673-682.

33. Cavalieri T. Pain management at the end of life. Clin Geriatrics. 2005;13:44-52.

34. Ballentine NH. Polypharmacy in the elderly: maximizing benefit, minimizing harm. Critical care nursing quarterly. 2008;31:40-45.

35. D'Astolfo CJ, Humphreys BK. A record review of reported musculoskeletal pain in an Ontario long term care facility. BMC geriatrics. 2006;6:5.

36. Murphy SL, Dubin JA, Gill TM. The development of fear of falling among community-living older women: predisposing factors and subsequent fall events. J Gerontol A Biol Sci Med Sci. 2003;58:M943-7.

37. Graven-Nielsen T, Lund H, Arendt-Nielsen L, Danneskiold-Samsøe B, Bliddal H. Inhibition of maximal voluntary contraction force by experimental muscle pain: a centrally mediated mechanism. Muscle & Nerve: Official Journal of the American Association of Electrodiagnostic Medicine. 2002;26:708-712.

38. Leveille SG, Jones RN, Kiely DK, Hausdorff JM, Shmerling RH, Guralnik JM, Kiel DP, Lipsitz LA, Bean JF. Chronic musculoskeletal pain and the occurrence of falls in an older population. JAMA. 2009;302:2214-2221.

39. Soriano TA, DeCherrie LV, Thomas DC. Falls in the community-dwelling older adult: a review for primary-care providers. Clin Interv Aging. 2007;2:545-554.

40. Whipple RH, Wolfson LI, Amerman PM. The relationship of knee and ankle weakness to falls in nursing home residents: an isokinetic study. J Am Geriatr Soc. 1987;35:13-20.

41. Kaya B. Yaşlılık ve depresyon-I tanı ve değerlendirme. Turkish Journal of Geriatrics. 1999;2:72-82.

42. Miu DK, Chan TY, Chan MH. Pain and disability in a group of Chinese elderly out-patients in Hong Kong. Hong Kong Med J. 2004;10:160-165.

43. İlhan MN, Maral I, Kitapçı M, Aslan S, Çakır N, Bumin MA. Yaşlılarda depresif belirtiler ve bilişsel bozukluğu etkileyebilecek etkenler. Klinik Psikiyatri. 2006;9:177-184.

44. Copeland J, Dewey P, Saunders P. Yaşlılarda depresyon. Cev İncila Kaplan Türk Psikiyatri Dergisi. 1992;3:3-8.

45. Karahan AY, Sahin N, Baskent A. Comparison of effectiveness of different exercise programs in treatment of failed back surgery syndrome: A randomized controlled trial. J Back Musculoskelet Rehabil. 2017;30:109-120.

ORIGINAL RESEARCH

Chronic Diseases, Depressive Symptoms and Socio-economic Characteristics Among Older Adults in Morocco: A pilot Study on Gender Differences

Abdelhafid Benksim[1,2], Rachid Ait-Addi[1], Elhassania Khalloufi[1,2], Aziz Habibi[1], Mohamed Amine[3], Mohamed Cherkaoui[1]

[1]Laboratory of Human Ecology, Faculty of Sciences Semlalia, Marrakesh, Morocco
[2]Higher Institute of Nursing Professions and Health Techniques, Marrakesh, Morocco
[3]Epidemiology Laboratory, Faculty of Medicine and Pharmacy, Marrakesh, Morocco

Abstract

Objective: Nowadays, the burden of chronic diseases and functional disabilities in elderly people has increased considerably in Morocco. Was to examine gender differences in self-reported health of the elderly, taking into account socio-economic, demographic and family characteristics.

Materials and Methods: A cross-sectional survey was conducted in Marrakech province. A group of 368 individuals aged 60 years or older was selected by a non-probability sampling through face-to-face interviews between March 2017 and June 2018. All participants were recruited from four community health care centers in the districts of Massira, Mhamid, and Daouidiate in Marrakech province. Statistical analyses were performed using SPSS software-version 16.0 (SPSS Inc., Chicago, IL, USA).

Results: Most elderly had poor socio-economic and health status with women being the most disadvantaged. Elderly women were significantly less educated, had no partner and were financially dependent on their children and relatives. They continued to suffer from depressive symptoms, musculoskeletal and gastrointestinal diseases (p<0.05). According to multivariate logistic regression analysis, marital status [odds ratio (OR)=0.257:0.140-0.472)], occupational status (OR=0.242:0.152-0.384) and number of children (OR=0.399:0.212-0.753), musculoskeletal diseases (OR=2.446:1.372-4.359) and gastrointestinal diseases (OR=2.856:1.392-5.862) were relatively independent predictive variables in elderly women.

Conclusion: This gender study explored the socio-economic, nutritional, well-being and psychological status of elderly residents in Morocco. These outcomes indicated the need for health support and institutional involvement for older people with more attention to the well-being of women.

Keywords: Aged, chronic disease, depression, gender identity, Morocco

Introduction

Population aging is considered as serious problem of health and social welfare challenges for all countries in the world (1). The world's population aged 60 and over will today increase from more than 800 million to two billion by 2050 (2). Prior studies have confirmed that gender differences are generally related to socio-economic and demographic characteristics which contribute to health inequalities in older people (3-5). Although women have a longer life expectancy than men (1); they are more likely to suffer from arthritis, osteoporosis, diabetes, hypertension, physical limitations and multiple chronic diseases which largely make them more dependent on their daily lives (4).

The main objective of this study was to determine the differences in health state among elderly men and women, using a combined framework of socio-economic status and functional impairments.

Eur J Geriatr Gerontol 2020;2(1):18-23

Benksim et al. Elderly People: Co-morbidities and Gender Differences

Materials and Methods

A cross-sectional study was conducted with the approval of the Ethic of the Moroccan health authorities in the region of Marrakech-Safi. A group of 368 older persons aged 60 years and over were selected by a non-probability sampling between March 2017 and June 2018. All participants were selected anonymously and privately through a face-to-face interview. According to the declaration of Helsinki, the study protocol was explained and informed consent was obtained. This declaration includes the fact that participants voluntarily agree to participate after being fully informed of the purpose, methods, risks, and benefits of our study via verbal discussion with study staff, followed by documentation in a written and signed informed consent form.

An interview guide was developed based on the study framework to guarantee that the same questions would be asked of each interviewed participant. This questionnaire includes a list of items relating to socio-economic and demographic characteristics (such as age, sex, marital status, number of children, educational level, previous employment status, income and the degree of perceived family support etc.).

In our survey, a nutritional mini-evaluation-short form (MNA-SF) is used to measure nutritional status (ranging from 0 to 14) (6). This tool includes six questions relating to anthropometric measurements, global assessment (mobility), dietary questionnaire and subjective assessment (neuropsychological problems, food intake). The MNA-SF scale is interpreted as follows: 1) Malnutrition: Zero to seven points, 2) Risk of malnutrition: Eight to 11 points and 3) Normal: Twelve points or greater.

Furthermore, searching health booklets provided all clinical and nutritional information such as functional disabilities and chronic diseases. Hence, the degree of physical disabilities was assessed when a person performed basic activities of daily living. There are six basic activities of daily living including bathing, dressing, feeding, transferring, continence and toileting (7).

In this survey, depressive symptoms were assessed with the 15-item version of the Geriatric Depression scale (GDS-SF), ranging from zero to 15 points: 1) Normal: Zero-five, 2) Moderate depression: Six-ten and 3) Severe depression: 11-15 (8). This scale is a screening tool for depression in the elderly in 15 questions, usually filled between five to seven minutes. Exclusion criteria were participants with dementia, severe neuropsychological disorders and speech impairments.

Statistics

All data were entered into database and analysed using SPSS software (version 16.0, Chicago, IL, USA). Pearson's χ^2 test and Fisher's exact test were used for differences in the percentage of nominal variables. Student's t-test was used to compare the means of variable. In order to explore gender differences, a multivariate analysis was performed to eliminate the confounders. A p-value less than 0.05, was regarded as statistically significant.

Results

A total of 368 participants were successfully included in this study. The socio-economic levels and demographic characteristics are given in Table 1. Of those interviewed, 45.9% were men and 54.1% were women. Moreover, 52.4% of participants are living in urban areas, 65% are widowed, and 83% are illiterates. Besides, older women complain significantly about illiteracy (78.9%), widowhood (66.8%), lack of health insurance (81.9%), and low income in the past (79.9%) than men counterparts (p≤0.005). The analysis of family characteristics showed that the older women continue to keep up a good relationship with their children (77.88%). Nevertheless, the clinical information and self-reported morbidities are presented in Table 2. The musculoskeletal disorders (38.7%), cardiovascular diseases (37.7%) and the gastrointestinal diseases (24.6%) were significantly the most common morbidities in older women (p<0.05). In addition, edentulism, visual, metabolic, kidney and respiratory diseases are gradually identified in elderly men and women without significant differences (p>0.05). Besides, there were statistically no significant differences between the elderly women and men on malnutrition status (p=0.364).

Table 1. Socio-demographic and economic characteristics of elderly, distributed by gender			
Variables and modalities	Older men (%)	Older women (%)	p
Age (year)	69.1±5.2	68.8±8.91	0.151
Current marital status			
Without partner	71 (42.0)	133 (66.8)	0.001
With partner	98 (58.0)	66 (33.2)	
Education level			
Illiterate	115 (68.0)	157 (78.9)	
Primary school	29 (17.2)	28 (14.1)	0.027
High school and above	25 (14.8)	14 (7.0)	
Health insurance	41 (24.3)	36 (18.1)	0.147
Previous occupation levels			
Low-income (1)	68 (40.2)	159 (79.9)	
With Middle-income (2)	82 (48.5)	28 (14.1)	0.001
With high-income (3)	19 (11.2)	12 (6.0)	
Origin			
Urban	86 (50.9)	99 (49.7)	0.828
Rural	83 (49.1)	100 (50.3)	
Number of children			
1 or more	111 (65.7)	149 (74.87)	0.040
0	58 (34.3)	50 (25.12)	
Relationship with children			
Good relationship	116 (68.63)	155 (77.88)	0.209
Mediocre relationship	37 (31.36)	36 (22.12)	

Benksim et al. Elderly People: Co-morbidities and Gender Differences

Eur J Geriatr Gerontol 2020;2(1):18-23

Furthermore, to screen the depressive symptoms, the GDF-SF: short form was performed. We found that severe depression was significantly observed among elderly women compared to men counterparts (p=0.030).

Table 2. Self-reported morbidities and depressive symptoms of elderly, distribution by gender

Variables and modalities	Older men (%)	Older women (%)	p
Reported co-morbidities			
Hypertension and heart affections	49 (29.0)	75 (37.7)	0.039
Asthma and respiratory conditions	9 (5.3)	11 (5.5)	0.932
Infectious illnesses	6 (3.6)	1 (0.5)	0.033
Dermatological infections	5 (3.0)	3 (1.5)	0.641
Arthritis and musculoskeletal diseases	33 (19.5)	77 (38.7)	0.001
Gastrointestinal affections	18 (10.7)	49 (24.6)	0.001
Diabetes and metabolic disorders	36 (21.3)	42 (21.1)	0.623
Urogenital diseases	17 (10.1)	11 (5.5)	0.102
Visual disturbances	56 (33.1)	63 (31.7)	0.363
Degree of dehydration			
Severe dehydration	34 (20.1)	51 (25.6)	0.308
Mild dehydration	135 (79.9)	148 (74.4)	
Hearing			
Without problem	110 (65.1)	138 (69.3)	0.503
Hearing impairment	59 (34.9)	61 (30.6)	
Dental and oral health			
Good oral status	21 (12.4)	30 (15.1)	0.618
Partial and severe edentulism	148 (87.6)	169 (84.9)	
Mini nutritional assessment-short form			
Malnutrition: Zero to seven points	25 (14.8)	30 (15.1)	0.364
Risk of malnutrition: Eight to 11 points	89 (52.7)	91 (45.7)	
Normal: 12 points or greater	55 (32.5)	78 (39.2)	
Activities of daily living			
Difficulty in everything	30 (17.8)	25 (12.6)	
A moderate difficulty	46 (27.2)	48 (24.1)	0.218
No difficulties	93 (55.0)	126 (63.3)	
Geriatric Depression scale (short form)			
Severe depression: 11-15	18 (10.7)	39 (19.6)	0.030
Mild to moderate depression: 6-10	48 (28.4)	42 (21.1)	
Normal: 0-5	103 (60.9)	118 (59.3)	

Table 3. Variables independently associated with elderly men (n=169) and women (n=199) according to the multiple logistic regression model.

Variables and modalities	β	Wald	p	OR	95% Confidence interval	
Marital status	**-1.359**	**19.157**	**0.000**	**0.257**	**0.140**	**0.472**
Education status	0.006	0.001	0.981	1.006	0.604	1.675
Insurance health coverage	0.709	2.547	0.111	2.033	0.851	4.857
Previous occupation levels	**-1.419**	**36.162**	**0.000**	**0.242**	**0.152**	**0.384**
Number of children	**-0.918**	**8.057**	**0.005**	**0.399**	**0.212**	**0.753**
Hypertension and heart diseases	0.582	4.458	0.035	1.790	1.043	3.072
Infectious diseases	-1.770	2.189	0.139	0.170	0.016	1.777
Musculoskeletal diseases	**0.894**	**9.197**	**0.002**	**2.446**	**1.372**	**4.359**
Gastrointestinal affections	**1.049**	**8.184**	**0.004**	**2.856**	**1.392**	**5.862**
Urogenital affections	**-0.628**	**1.538**	**0.215**	**0.534**	**0.198**	**1.440**
Activities of daily living	**0.147**	**0.671**	**0.413**	**1.158**	**0.815**	**1.644**
Geriatric depression scale (GDS-SF)	**-0.211**	**1.312**	**0.252**	**0.809**	**0.564**	**1.162**

Abbreviations: β: Constant; p: Significance level of the Wald test; OR: Odds ratio

In Table 3, the multiple logistic regression model displayed that marital status 0.257 (95% CI: 0.140-0.472), previous occupation level 0.242 (95% CI: 0.152-0.384), number of children 0.399(95% CI: 0.212-0.753), musculoskeletal disorders 2.446 (95% CI: 1.372-4.359), and gastrointestinal diseases 2.856 (95% CI: 1.392-5.862) were relatively independent predictive variables associated with older women.

Discussion

This present cross-sectional is one of the few studies among elderly people in Morocco. Regarding the socio-economic status, older women were significantly more likely than men to have low previous occupational status (79.9%) or to live in low-income families, to be widowed or single (66.8%), to be illiterates (78.9%) and to rely financially on their children (74.87%). These findings have been corroborated by earlier studies conducted in low- and middle-income countries (9,10). Hence, similar studies found that illiteracy was higher among women than men counterparts (9,10). Given this trend, the gender gap in education might significantly decrease in the future for older people, as a result, both of the improvements in the general level of education and of an increase in enrolment of Moroccan girls. Moreover, earlier studies have shown that older women are more likely to live alone, single or widowed in developing countries (5,11,12). In fact, these gender differences can be attributed to remarriage tendencies observed particularly among older men in developing countries. As a consequence, older women often refused to remarry, because they fear social pressure, public judgment, insults and even humiliation from the community (5).

In this study, interviewed women continue to come up an affective relationship with their children and even relatives. Building on numerous prior studies and reports, many elders lost their income and remain dependent financially and socially on their children and even relatives (11,13). Moreover, other studies have also revealed that poor socio-economic status and illiteracy are the negative determinants associated with older women in developing countries (9,14). In Morocco, the homemaker position of women could explain their poor socio-economic status, their low outdoor physical activity and their financial dependence on their relatives.

In this investigation, the most elders suffered from multiple chronic diseases, functional disabilities and malnutrition with no significant difference between women and men, but considerably with a higher prevalence of depressive symptoms, gastrointestinal and musculoskeletal diseases in women, being the most disadvantaged. Similar findings displayed that elderly people are mostly suffering from chronic conditions, functional impairments and depressive symptoms (1,14,15). In addition,

the musculoskeletal, cardiovascular, gastrointestinal diseases, depression and dehydrations were strongly the most important co-morbidities appeared among older people. Besides, previous studies have shown the same results in Lebanon and the Middle East as a whole (13,16). Furthermore, earlier studies have described that older women have significantly higher prevalence of diabetes, hypertension, arthritis, osteoporosis, migraine, autoimmune and musculoskeletal diseases than men counterparts (1,13,16-19). In analogous studies, the higher prevalence of musculoskeletal disorders in the elderly women can be explained by their painful household activities and their higher prevalence of overweight and obesity (20,21) Likewise, a relationship has been observed between musculoskeletal diseases and negative determinants of health, such as overweight, low education, poor health, and sedentary lifestyle (21,22). In contrast, empirical research has shown that older women, who tend to have multiple chronic conditions rather than fatal, have a longer life expectancy than their male counterparts (1).

Furthermore, the results from the binary logistic regression analysis demonstrated that gastrointestinal diseases were significantly recognized in elderly women and were not intrinsically different from those which occur in men. Besides, other studies have found that women are more likely to suffer from constipation, bloating, swollen belly, tight clothing, irritable bowel, rectocele and asthenia (23,24). In addition, Rectocele syndrome was often due to advanced age, multiparty, vaginal delivery, pelvic surgery and other conditions which are increasing intra-abdominal pressure such as obesity and constipation in elderly women (25).

Regarding depressive symptoms recognized as a public health problem commonly identified in the elderly, our study found that 19.6% of older women had significantly some degree of severe depression. This burden is often combined with poor self-rated health and low socio-economic status which can negatively affect successful aging in Morocco. Similarly, empirical studies have shown older women are considerably more likely to develop severe depression than men counterparts (26-29). As a result, the women psychological traumatism are possibly related to complex interactions including, poor socio-economic status, low education level, reduced daily activity, poor health state, neurobiological changes and stressful life events (13,15).

Study Limitations

Our study limitations included that further investigations among the elderly people should be conducted in other Moroccan regions in order to provide additional information. In addition, a high-quality of dialogue between all participants will be recommended for a better management of successful aging in Morocco.

Benksim et al. Elderly People: Co-morbidities and Gender Differences

Eur J Geriatr Gerontol 2020;2(1):18-23

Conclusion

Chronic diseases and depressive symptoms were common concerns in elderly people. As a result, we suggest that special attention and comprehensive clinical evaluations should be carried out, particularly in elderly women suffering from depressive symptoms and multiple chronic diseases. Therefore, our findings have demonstrated the need for an integrated national framework to analyse the impact of socio-economic and demographic factors on women's health status as a basis for developing policies and interventions in Morocco.

Ethics

Ethics Committee Approval: This study was conducted with the approval of the Ethic of the health authorities in the Region of Marrakech-Safi.

Informed Consent: Informed consent was obtained.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Concept: A.B., A.H., M.C., Design: A.B., A.H., M.C., Data Collection or Processing: A.B., A.H., M.C., Analysis or Interpretation: A.B., A.H., R.A.A., E.K., M.C., Literature Search: A.B., A.H., R.A.A., M.C., Writing: A.B., A.H., M.C.

Conflict of Interest: Authors have declared no conflicts of interest.

References

1. Adjei NK, Brand T, Zeeb H. Gender inequality in self-reported health among the elderly in contemporary welfare countries: a cross-country analysis of time use activities, socioeconomic positions and family characteristics. PLoS One 2017;12:e0184676.

2. Noroozian M. The elderly population in Iran: an ever growing concern in the health system. Iran J Psychiatry Behav Sci 2012;6:1-6.

3. Barreto SM, Giatti L, Kalache A. Gender inequalities in health among older Brazilian adults. Pan Am. J. Public Health 2004;16:110-117.

4. Vlassoff, C. Gender differences in determinants and consequences of health and illness. J Health Popul Nutr 2007;25:47-61.

5. Osmani N, Matlabi H, Rezaei M. Barriers to Remarriage Among Older People: Viewpoints of Widows and Widowers. J Divorce Remarriage 2018;59:51-68.

6. Soysal P, Veronese N, Arik F, Kalan U, Smith L, Isik AT. Mini Nutritional Assessment Scale-Short Form can be useful for frailty screening in older adults. Clin Interv Aging 2019;14:693-699.

7. Elsawy B, Higgins KE. The geriatric assessment. Am Fam Physician 2011;83:48-56.

8. Chaaya M, Sibai AM., El Roueiheb Z, Chemaitelly H, Chahine LM, Al-Amin H, Mahfoud Z. Validation of the Arabic version of the short Geriatric Depression Scale (GDS-15). Int Psychogeriatr 2008;20:571-581.

9. Yount KM, Sibai AM. Demography of aging in the Arab countries. International Handbook of Population Aging. Volume 1. Edited by: Uhlenberg P. Dordrecht: Springer Netherlands, 2009 p 277-315.

10. Al Hazzouri AZ, Sibai AM, Chaaya M, Mahfoud Z, Yount KM. Gender differences in physical disability among older adults in underprivileged communities in Lebanon. J Aging Health 2011;23:367-382.

11. Doumit JH, Ramzi NN, Dimitri RH. Nutritional and health status among nursing home residents in Lebanon: comparison across gender in a national cross sectional study. BMC Public Health 2014;14:629.

12. Endo Y, Aharonoff GB, Zuckerman JD, Egol KA, Koval KJ. Gender differences in patients with hip fracture: a greater risk of morbidity and mortality in men. J Orthop Trauma 2005;19:365-366.

13. Hajjar RR, Atli T, Al-Mandhari Z, Oudrhiri M, Balducci L, Silbermann M. Prevalence of aging population in the Middle East and its implications on cancer incidence and care. Ann Oncol 2013; 24(Suppl 7):vii11-vii24.

14. Khaje-Bishak Y, Payahoo L, Pourghasem B, Jafarabadi MA. Assessing the quality of life in elderly people and related factors in tabriz, iran. J Caring Sci 2014;3:257-263.

15. Roberts KC, Rao DP, Bennett TL, Loukine L, Jayaraman GC. Prevalence and patterns of chronic disease multimorbidity and associated determinants in Canada. Health Promot Chronic Dis Prev Can 2015;35:87-94.

16. Boulos C, Salameh P, Barberger-Gateau P. The AMEL study, a cross sectional population-based survey on aging and malnutrition in 1200 elderly Lebanese living in rural settings: protocol and sample characteristics. BMC Public Health 2013;13:573.

17. Senanayake P. Women and reproductive health in a graying world. Int J Gynaecol Obstet 2000;70:59-67.

18. Oksuzyan A, Juel K, Vaupel JW, Christensen K. Men: good health and high mortality. Sex differences in health and aging. Aging Clin Exp Res 2008;20:91-102.

19. Halilaj E, Moore DC, Laidlaw DH, Got CJ, Weiss APC, Ladd AL, Crisco JJ. The morphology of the thumb carpometacarpal joint does not differ between men and women, but changes with aging and early osteoarthritis. J Biomech 2014;47:2709-2714.

20. Sharma D, Mazta SR, Parashar A. Morbidity pattern and health-seeking behavior of aged population residing in Shimla hills of north India: A cross-sectional study. J Family Med Prim Care 2013;2:188-193.

21. Andorsen OF, Ahmed LA, Emaus N, Klouman E. High prevalence of chronic musculoskeletal complaints among women in a Norwegian general population: the Tromsø study. BMC Res Notes 2014;7:506.

22. Buskila D, Abramov G, Biton A, Neumann L. The prevalence of pain complaints in a general population in Israel and its implications for utilization of health services. J Rheumatol 2000;27:1521-1525.

23. Hungin APS, Chang L, Locke GR, Dennis EH, Barghout V. Irritable bowel syndrome in the United States: prevalence, symptom patterns and impact. Aliment Pharmacol Ther 2005;21:1365-1375.

24. Reginelli A, Pezzullo MG, Scaglione M, Scialpi M, Brunese L, Grassi R. Gastrointestinal disorders in elderly patients. Radiol Clin North Am 2008;46:755-771.

25. Mustain WC. Functional disorders: rectocele. Clin Colon Rect Surg 2017;30:63-75.

26. Girgus JS, Yang K, Ferri CV. The Gender Difference in Depression: Are Elderly Women at Greater Risk for Depression Than Elderly Men? Geriatric 2017;2:35.

27. Kessler RC. Epidemiology of women and depression. J Affect Disord 2003;74:5-13.

28. Nolen-Hoeksema S. Gender differences in depression. Curr Dir Psychol Sci 2001;10:173-176.

29. Chan D, Kwok A, Leung J, Yuen K, Choy D, Lueng PC. Association between life events and change in depressive symptoms in Hong Kong Chinese elderly. J Affect Disord 2012;136:963-970.

CASE REPORT

Delusion of Pregnancy in a Case of Dementia

 N.A. Uvais

Iqraa International Hospital and Research Centre, Clinic of Psychiatry, Calicut, India

Abstract

Delusion of pregnancy is a disorder characterised by a false and fixed belief of being pregnant despite factual evidence to the contrary. Although delusions are a common and troublesome feature of dementia, delusions of pregnancy have rarely been reported. We report the case of a 70-year-old widowed female with dementia who presented with delusion of pregnancy. She was not taking any antipsychotic medications prior to the onset of delusion and her serum prolactine level was normal.

Keywords: Delusion of pregnancy, dementia, elderly

Introduction

Delusion of pregnancy is a disorder characterised by a false and fixed belief of being pregnant despite factual evidence to the contrary. This psychopathological symptoms has been reported in women of all age group as well as in men. A recent systematic review of 84 cases of delusion of pregnancy published in the literature showed that this condition predominantly affect females between 20-40 years of age and often seen associated with schizophrenia, bipolar disorders and psychotic depression (1). There are also rare reports of delusion of pregnancy secondary to various organic disorders such as epilepsy, motor neurone disease, delirium, Metabolic syndrome, primary heperprolactinaemia, hashimoto thyroidits, sarcoidosis, primary sterility due to tubal cyst, hypothyroidism and intermittent polydipsia and Hyponatremia syndrome (1). There are also occasional reports of delusion of pregnancy in patients with dementia. Here, we report the case of a 70-years-old female with dementia who presented with delusion of pregnancy.

Case Report

A 76 year-old childless widow was brought to the psychiatry outpatient department by her relatives with a history of progressive memory loss over the last six years. She had become increasingly disinhibited and restless over the previous 12 months. She also started to state repeatedly that she was pregnant. She often enquire the safety of the medications during pregnancy before taking it and resist activities where she need to bow down. There was no history of weight gain or constipation. There was no past history of medical or psychiatric illness. There was no significant family history of any medical or psychiatric illness. Abdominal examination was normal.

During mental status examination she reported that she is six month pregnant. There was no hallucinations or other delusions. Her affect was cheerful. She showed significant impairment in both recent and remote memory. She scored 19 in mini-mental state examination. Structural neuroimaging showed age related brain atrophy. Serum prolactin level was with in normal limits. Using the Cambridge behavioural inventory, a checklist of cognitive and behavioural symptoms, which was completed by the patient's brother, there was also evidence for impaired memory and orientation, loss everyday skills, impaired self care, mood fluctuations, abnormal behaviour, beliefs in odd or bizarre ideas that cannot be true, poor table manners, disturbed sleep and indifferent to the worries of family members. She was diagnosed with Alzheimer's dementia with behavioural and psychological symptoms.

Discussion

There are few published reports of delusion of pregnancy in patients with Alzheimer's dementia. Guilfoyle et al. (2) reported

Cite this article as: N.A. Uvais. Delusion of Pregnancy in Case of Dementia. Eur J Geriatr Gerontol 2020;2(1):24–25

Eur J Geriatr Gerontol 2020;2(1):24-25

N.A. Uvais. Delusion of Pregnancy in Dementia

a case series of five elderly woman aged between 74-89 years. Out of the five patients, two had a dementing illness. Cipriani & Fiorino done a systematic literature review to identify the characteristic of a psychotic symptom, the phenomenon of delusion of pregnancy, in the context of dementia. They described three case reports of delusion of pregnancy in Alzhiemer's dementia and two case reports in frontotemporal dementia (3). Curran and Pugh described three elderly patients with delusion of pregnancy, of which two had dementia (4).

Various psychological and socio-cultural factors have been implicated in the causation of delusion of pregnancy. Even though delusion of pregnancy occurred in our patient in the setting of a dementing illness, it appeared to indicate wish fulfilment. She had a repressed sexual life and had no children.

Treatment with anti-psychotic medications is an important cause of delusion of pregnacy since its use are associated with hyperprolactinaemia and weight gain. However, our patient was not on any anti-psychotics prior to the onset of the delusion of pregnancy and her serum prolactine level was normal. Most of the past reports also described distended abdomens and constipation associated with delusion of pregnancy. However, our patient did not show these symptoms.

Ethics

Informed Consent: Informed consent was obtained from the patients or their relatives.

Peer-review: Internally peer-reviewed.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Bera SC, Sarkar S. Delusion of pregnancy: a systematic review of 84 cases in the literature. Indian J Psychol Med 2015;37:131-137.

2. Guilfoyle P, O'Brien H, O'Keeffe ST. Delusions of pregnancy in older women: a case series. Age and Ageing 2015;44:1058-1061.

3. Cipriani G, Di Fiorino M. Delusion of Pregnancy: an unusual symptom in the context of dementia. American Journal of Alzheimer's Disease Other Dementias 2014;30:341-345.

4. Curran JSM, Pugh RE. Delusions of pregnancy and delivery in elderly women. International Journal of Geriatric Psychiatry 1995;10:1075-1076.

LETTER TO THE EDITOR

Revisiting the Role of Telemedicine Under the 2019 Novel Coronavirus Outbreak

Ⓘ Sunny Chi Lik Au

Pamela Youde Nethersole Eastern Hospital, Clinic of Special Out Patient, Hong Kong, China

To the editor,

With the increasing number of reported pneumonia cases infected by 2019 novel coronavirus (2019-nCoV) and its associated mortality, (1) there is no doubt about its public health impact. Spreading beyond borders to different continents, 2019-nCoV is pushing the global healthcare system's burden to a limit. With possible transmission between humans through close contact, (2) and a significant basic reproductive number (3), isolation is unavoidable as a public health measures.

Initially emphasizing mainly on distance and designed for rural area with remote access to medical facilities, telemedicine do play a role in patient care under the 2019-nCoV outbreak. It is particularly useful when significant proportion of people in the community have travelled to epidemic area, thus requiring self-quarantine for 14 days of observation period. Replacing routine services by telemedicine, the hospital not only saved manpower and resources to those infected cases requiring medical and ventilator support, but also prevented human-to-human transmission through public transportation and indoor clustering within waiting halls. Besides, stable inactive chronic diseases patients with regular hospital follow-up appointments could be diverted to these temporary "cyber-clinics"; whereas electronic service kioskis help streamlining monthly to quarterly interval dispensing of medications via pharmacies.

Telemedicine can be classified as tele-visits, tele-supervision, tele-monitoring, tele-interpretation and tele-consultation (4). Concerning patient's privacy, real-time (synchronous) interaction like tele-visits and tele-consultation are rather sensitive with medico-legal concerns. However, unidirectional communications (store-and-forward) by hinting or reporting with subsequent feedback are much simpler (5). Common examples include actively hinting patients on timely usage of medication, regular physiotherapy or latest update of the 2019-nCoV outbreak. In contrast, patients can aid their caring doctors by updating blood pressure readings, hemastix results, or even ankle edema photos, thus facilitating home titration of anti-hypertensive medications, insulin or even diuretics respectively.

Geriatric patients are popular hospital visitors, especially with sub-specialization of medicine in modern dates. Counting from the first confirmed 2019-nCoV pneumonia case in Hong Kong on 23rd January towards the first 2019-nCoV mortality case on 4th February, there was a drastic rising trend on the daily clinic non-attendance rate from 4.0% to 42.1%. Five hundred eighty-six patients (29.4%) already defaulted our out-patient clinics' appointments during this period with different types of reasons, which telephone survey revealed "worrisome of 2019-nCoV transmission within hospital area" as the top cause (52.0%). Among these 586 patients, 61.8% were aged 65 years or older. It is understandable that hospital is a relatively high risk area, especially to elderly with multiple comorbidities, not to say those with frequent exacerbation of chronic obstructive pulmonary diseases, immunocompromised, cancer and transplant patients.

In conclusion, accessibility of healthcare service becomes the major public healthcare service gap under the 2019-nCoV outbreak. No matter how close the physical distance between the geriatric patients' home and the hospital, it is still considered as "remote" if inaccessible. Despite the strength of telemedicine on facing the 2019-nCoV globe challenge, basic infrastructure is still the prerequisite.

Address for Correspondence: Sunny Chi Lik Au, Pamela Youde Nethersole Eastern Hospital, Clinic of Special Out Patient, Hong Kong, China
Phone: +852 2162 6909 **E-mail:** kilihcua@gmail.com **ORCID:** orcid.org/0000-0002-5849-3317

Keywords: Telemedicine, coronavirus, disease outbreaks

Ethics

Peer-review: Internally peer-reviewed.

Financial Disclosure: The author declared that this study received no financial support.

References

1. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, Qiu Y, Wang J, Liu Y, Wei Y, Xia J, Yu T, Zhang X, Zhang L. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet. 2020;395:507-513.

2. Phan LT, Nguyen TV, Luong QC, Nguyen TV, Nguyen HT, Le HQ, Nguyen HQ, Cao TM, Pham QD. Importation and Human-to-Human Transmission of a Novel Coronavirus in Vietnam. N Engl J Med. 2020;382:872-874.

3. Wu JT, Leung K, Leung GM. Nowcasting and forecasting the potential domestic and international spread of the 2019-nCoV outbreak originating in Wuhan, China: a modelling study. Lancet. 2020;395:689-697.

4. Serper M, Volk ML. Current and Future Applications of Telemedicine to Optimize the Delivery of Care in Chronic Liver Disease. Clin Gastroenterol Hepatol. 2018;16:157-161.e8.

5. Ayatollahi H, Nourani A, Khodaveisi T, Aghaei H, Mohammadpour M. Teleophthalmology in Practice: Lessons Learned from a Pilot Project. Open Med Inform J. 2017;11:20-28.