Review of: "Determining Appropriateness of Antibiotic Therapy in Nursing Home Residents: A Review"

Martin Prof. Dr. Mielke[1], Vanda Marujo[1]

1 Robert Koch Institut

Potential competing interests: The author(s) declared that no potential competing interests exist.

Aim

The paper entitled "Determining Appropriateness of Antibiotic Therapy in Nursing Home residents: A Review" aims to identify and review studies of appropriateness of antibiotic therapy in nursing homes with special focus on the criteria utilized for determining appropriateness of antibiotic therapy initiation.
This paper addresses an important topic. The manuscript is well written, the methods are adequate and the conclusions are legitimate.

According to the reviewers´ view, the manuscript would take profit, if up to date epidemiologic data about infections (e.g. spectrum) in nursing home residents as well as antibiotic use would be included in the discussion. In the European context, data from the HALT-project could be a suitable data base (https://www.ecdc.europa.eu/en/healthcare-associated-infections-long-term-care-facilities).

Quality and quality management of healthcare in nursing homes would be enriched by the publication of this review, especially by its consideration in the context of upcoming studies about the appropriateness of antibiotic therapy.

In Detail:

Pertinence

The review is pertinent in view of the problematic of antibiotic overuse in nursing homes, in terms of potential direct adverse events for individual residents as well as of antimicrobial resistance at the population level.
While other (systematic) reviews* focused on assessing the effectiveness of interventions to reduce (potentially inappropriate) antibiotic use in long-term care facilities, this is, to our knowledge, the first review to evaluate and compare the findings of studies of appropriateness of antibiotic therapy as well as to evaluate the methodology utilized for determining appropriateness of antibiotic therapy in those studies.

Added value: Use of study results to inform need for future research with concrete suggestions

Besides the low rates of appropriateness of antibiotic therapy identified, this investigation also found considerable variation in the methodology of the included studies, which limits interpretation of the findings. Being so, this study lays

the foundations for future standardized research on this topic (with concrete recommendations from the author: “standardize the design of future studies” as well as “the overall approach to evaluating the diagnosis and treatment of infection in the nursing home setting.”) This future research will, in turn, be fundamental to plan interventions that are effective at optimizing antibiotic use in this setting.

Furthermore, the author enumerates additional issues that need to be addressed, such as other components of appropriateness of antibiotic use (choice of antibiotic, dosing of an antibiotic in an elderly population, and duration of therapy), the distinction between type of care (post-acute versus long-term care) or the need for dissemination of criteria for evaluating appropriateness to nursing home practitioners and staff. Another issue that could be raised in this review at this point (discussion) is the appropriateness of antibiotic use for prophylaxis (for instance, bacterial endocarditis, UTI).

Methods

Consider presenting the search strings as well as a flow diagram of the studies included in the analysis (with number of identified and excluded articles and reason for exclusion) as supplementary material to this paper.

Discussion

Consider adding epidemiological data on prevalence of healthcare-associated infections and antimicrobial use in long-term care facilities.

Text structure / order

Consider moving some text paragraphs to other sections, e.g. 1st paragraph after Table 2 “Surveillance definitions for infections specifically designed for nursing homes…” could be better accommodated in the introduction; the 2nd paragraph under “Utilization of the revised McGeer criteria”) discussing “the validity of the 8 studies of appropriateness of antibiotic therapy” could be adequately presented in the Discussion section; the 1st paragraph under “Studies that utilized the Loeb criteria[20] to evaluate appropriateness of antibiotic therapy in nursing home residents (Table 3)” appears to be hold introductory data on the above mentioned criteria, therefore this could be presented in the “Introduction”.

Editorial mistakes

Correct some misprints and other editorial mistakes, for instance:

Table 1: wrong reference order (references 26 and 27 appear in the table before the first reference to 25 - in the text following the table), extra line in the study Warren 1991; Table 3: extra line in the study Doernberg 2015, MD is missing in the legend, wrong sign in column study years in study Pulia 2018; Table 4, legend: “Rev Loeb = revised Loeb criteria;38” these criteria as “revised” as well as the reference number are not found in the table (also, the study corresponding to the planned revision of the Loeb criteria has the reference number 67); Table 5, legend: typo at “Post-Inter”.

* Raban MZ, Gasparini C, Li L, Baysari MT, Westbrook JI. Effectiveness of interventions targeting antibiotic use in long-term aged care facilities: a systematic review and meta-analysis. BMJ Open. 2020 Jan 9;10(1):e028494. doi: 10.1136/bmjopen-2018-028494. PMID: 31924627; PMCID: PMC6955563.

Fleming A, Browne J, Byrne S. The effect of interventions to reduce potentially inappropriate antibiotic prescribing in long-term care facilities: a systematic review of randomised controlled trials. Drugs Aging. 2013 Jun;30(6):401-8. doi: 10.1007/s40266-013-0066-z. PMID: 23444263.

Crayton E, Richardson M, Fuller C, Smith C, Liu S, Forbes G, Anderson N, Shallcross L, Michie S, Hayward A, Lorencatto F. Interventions to improve appropriate antibiotic prescribing in long-term care facilities: a systematic review. BMC Geriatr. 2020 Jul 9;20(1):237. doi: 10.1186/s12877-020-01564-1. PMID: 32646382; PMCID: PMC7350746.