On the basis of the findings of this review, the authors propose that clinicians consider screening for sarcopenia in community and geriatric settings. However, this is premature in the absence of unequivocal evidence of short and long-term benefit for the existing interventions. Nevertheless as geriatricians we should have a high index of suspicion for sarcopenia in our patients across healthcare settings, be willing to measure as well as interpret gait speed , muscle strength and mass, and consider how best we can institute exercise programmes where indicated, together with dietary advice. It is time to translate existing research findings into clinical practice.

Key points

- Sarcopenia is common in older people across healthcare settings.
- It can be identified by assessing muscle mass, strength and physical performance.
- Exercise, particularly resistant exercise, is beneficial.
- The evidence for nutritional interventions at present is equivocal.

Conflicts of interest

None declared.

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Inappropriate drug use among older persons: is it time for action?

Despite recent efforts to improve drug management for older people, we have not yet arrived at an optimal strategy for reducing inappropriate drug use. Drugs are considered inappropriate, if the risk outweighs the potential benefit of the drug. Along with pathophysiological changes during the ageing process, and the increasing number of co-morbidities/-medications, the potential risks of drugs increase with age and adverse drug reactions (ADRs) are encountered more frequently in older persons [1]. ADRs account for ~3–5% of all hospital admissions and are very costly [2, 3]. Therefore, inappropriate drug use and ADRs are hot topics in geriatric medicine. ADR is an important outcome the clinician wants to avoid, and inappropriate drug use is one of the potentially modifiable risk factors. Yet, the interrelationship between inappropriate drug use and ADRs is a matter of debate: it seems that the crude number of prescribed drugs (i.e. polypharmacy) is a stronger risk factor for ADRs than inappropriate drug use *per se* [4]. Only ~6% of ADRs are directly attributable to an inappropriate drug use [4].

The article from Tosato *et al.* [5] assessed the prevalence of potentially inappropriate drug use among older in-hospital patients. To determine prevalence, Tosato *et al.* based their research on the recently updated Beers criteria and the

STOPP list [6, 7]. Tosato *et al.* show that both the updated Beers criteria and the STOPP list identify a high prevalence of potentially inappropriate drug use [5]. Though drug use identified by these lists is only *potentially* inappropriate, the high prevalence rates are alarming. Both tools were developed by an expert consensus, but there are some important qualitative differences in the way the lists are structured. This may be why, in a significant proportion of patients, each tool identified potentially inappropriate drug use that was undetected by the other tool [5]. Tosato and his team document the imperfections of each tool, along with their advantages and disadvantages. The authors are among the first to compare the recently updated Beers criteria to the STOPP list. Studies that had used previous versions of the Beers criteria consistently found that the STOPP list identified a higher proportion of clinically relevant inappropriate drugs than the Beers list [8, 9]. In contrast, Tosato's study found similar prevalence with both lists. Tosato and his team also found that potentially inappropriate drug use, as identified by the updated Beers criteria or the STOPP list, was associated with two outcomes: ADR and functional decline. The latter is an extremely important outcome in older persons [10]. Tosato's article therefore adds to current evidence, since previous studies that used earlier versions of the Beers criteria found no or only weak association with adverse health outcomes [9, 11]. In fact, the authors propose to consider using a list combining Beers criteria and the STOPP list for achieving optimal sensitivity for detection of a clinically relevant inappropriate drug use.

Though prevalence data on potentially inappropriate drug use and its associations with adverse outcomes are of great interest, one important question remains: does the use of tools such as the Beers or STOPP list ultimately improve patient outcomes? Current evidence from intervention trials suggests that the implementation of both these tools reduces inappropriate drug use and the level of polypharmacy, as well as drug–drug and drug–disease interactions [12, 13], but no study so far showed that this improves important patient outcomes such as mortality and morbidity. One study found no effects on mortality and falls, but it was underpowered to answer this research question [12].

To move the field in the right direction, we offer three suggestions. First, tools like Beers criteria and STOPP list should be updated at regular intervals and should continue to be developed. Intervention trials should then demonstrate if these optimised tools ultimately improve important patient outcomes, including mortality. Second, medical education should address the question of drug management in older persons, and issues of inappropriate drug use, beginning in the first year of medical school and continuing throughout later medical education [14]. A recently published consensus document on the minimum requirements of geriatric learning objectives for medical students clearly recommends that at the end of medical school each graduate should know how to detect and manage drug underuse, overuse (including inappropriate medication use) and polypharmacy in older people [15]. Third, to improve drug management in older persons, currently available tools for the identification of inappropriate drug use, such as the Beers criteria or the STOPP list, should be systematically implemented and used in the clinical care of older persons. There is potential for optimisation, for example, by incorporating these tools into electronic databases which clinicians can automatically check for potential inappropriate drug use and drug–drug interaction, or by building computer-based decision–support and electronic prescribing systems [1, 16]. Concomitantly, additional tools for other aspects of drug management should be implemented, such as the START list to avoid drug underuse or the CRIME recommendations specifically developed for complex patients [7, 17]. It is time for action.

Key points

- Tools for the detection of inappropriate drugs (e.g. Beers criteria or Screening Tool of Older Person's Prescriptions [STOPP]) are still imperfect, but their implementation in clinical routine may reduce inappropriate drug use.
- More research is needed to further refine these tools and document their effectiveness to improve patient outcomes, but, nevertheless, there is sufficient evidence to recommend the systematic use of these tools in older patients.

Conflicts of interest

None declared.

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Survival in the elderly after acute myocardial infarction: room for more improvement

Globally, the world's population is growing and in general longevity is increasing. Consequently, there are more older people living and at risk of acute myocardial infarction (AMI). Older persons who present with AMI have higher mortality rates compared with younger patients, and the reasons for this are multifactorial [1]. So why do very elderly persons have a much worse prognosis post-AMI? Most likely, it is the association of increasing age with co-morbidity [2–5] and that life expectancy falls as age rises.

Age-related variations in presentation, treatment and clinical evidence may negatively influence AMI outcomes in the elderly. Elderly patients are under-represented in clinical trials, with some trials using an enrollment limit of 70–80 years [6]. Older persons are more likely to present with atypical symptoms, which could mask recognition of an AMI which in turn would increase the time to treatment (i.e. coronary reperfusion therapy) [7]. Older persons are also more likely to present with non-ST elevation myocardial infarction (NSTEMI), which is a much more heterogeneous condition than ST elevation myocardial infarction (STEMI) which is usually associated with typical severe symptoms of sudden onset [8]. Finally, older AMI survivors may be less likely to receive an evidence-based treatment [9–12].

Alabas *et al*. [13] have described a population-based cohort study on survival after AMI in relation to age at presentation in 583,466 patients (41.1% with STEMI) using data from the United Kingdom Myocardial Ischaemia National Audit project (MINAP) database (2003–10). Alabas *et al*. [13] report that patients who are <65 years of age have higher survival rates than patients ≥65 years, but in contrast to individuals <65 years, improvements in survival between 2003 and 2010 were only observed in older persons. Interestingly, the temporal trends in survival rates for the elderly and the very elderly (>80 years) for both STEMI and NSTEMI were similar. The study is novel in terms of methodology (i.e. the forms of survival analyses) and also in the type of information that has been analysed (i.e. by age and MI type).

A number of other studies have shown reductions for in-hospital and 30-day mortality among elderly patients with AMI, and this has been attributed to an increase in prescription of an evidence-based medication [9–12]. However, these studies have also reported that the subgroup of elderly patients >75 years were prescribed a less evidence-based medication [9–12], implying the potential for further scope in health-care improvements.