Towards safe medication use of geriatric patients: a novel combined tool for identification of potential drug related problems

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Background Medication review is an essential element of pharmaceutical care, assessing patients? medications to id entify drug related problems (DRPs). There is a growing amount of evidence-based research suggesting older people are at risk of potentially inappropriate medications (PIMs) due to multi-morbidity and polypharmacy.
Purpose The aim of the study was to develop a novel combined tool for identification of DRPs in geriatric multi-morbid patients, using the European PIM tools, namely the EU(7)-PIM and EURO-FORTA lists, and to categorise PIMs stated on both lists to be applicable for integrated e-health prescribing systems in Estonia.
Method The novel combined PIM tool was structured relying on clinical significance of the active substances from the EU(7)-PIM and EURO-FORTA lists, and the red-yellow-green-grey color coding was used to support the interpretation of the information, and to enable the adjustment of the tool to the local electronic interaction and counter indication INXBASE/RISKBASE system. Based on the risk and severity of DRPs, the PIMs were classified into four groups: very significant PIMs (should be avoided) as red, significant PIMs (require dose and/or treatment duration adjustment) as yellow, non-significant PIMs/non-PIMs (low DRP risk) as green, and questionable PIMs (incomplete/missing information) as grey color.
Findings The list of the red PIMs contains 34 active substances, including one combination of two drugs and one drug class. Most of the red PIMs belong to the A (29.4%) and C (29.4%) medication groups according to the ATC classification, and only 41.2% the red PIMs are registered and approved in Estonia on country-specific pharmaceutical market. The top 4 most frequently used red PIMs in Estonia in 2019/2020 according to the present research were sodium picosulfate (DDD=4.3637), propafenone (DDD=3.5699), ginkgo biloba (DDD=2.3355), and magnesium hydroxide in combination with other antacids (DDD=1.187). As the identification of the yellow and green PIMs depends directly on an individual patient clinical characteristics, it was not possible to present the total list of the yellow/green color PIM in general at the moment (preliminary data expects around 248 yellow+greed PIMs), and it needs closer investigation in the future. The complete list of the grey PIMs will be also reached in the future.
Conclusion The combined PIM tool was developed with a focus on the high risk medications for older adults and taking into consideration the availability of the PIMs in the Estonian pharmaceutical market. In the future, it can be applied as a screening e-tool to identify DRPs in different health care settings.