

Prevention of adverse drug reactions in a geriatric nursing home

Elaboration of a practical table on adverse drug reactions and their monitoring

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Introduction:

Older patients are more prone to adverse drug reactions than younger people because of polypharmacy, multimorbidities, renal dysfunction and increased sensitivity to side effects. Underlying diseases like dementia or depression make diagnosis of side effects difficult. Monitoring regularly clinical and laboratory parameters could help to detect and prevent adverse drug reactions.

Objectives:

- to develop a practical overview on relevant adverse drug reactions of the drugs used in the nursing home including
- specific dosing information for geriatric patients
- recommendations for regular laboratory controls

Methods:

We focussed our research on cardiovascular, psychiatric and respiratory drugs figuring in the drug formulary of the nursing home. Discussions with the two responsible physicians showed that they were interested especially in:

- a summary of frequent and important side effects
- preventive measures like control of laboratory parameters
- information on clinical relevant drug interactions
- recommendations for dose reduction (in renal failure, respectively when starting or stopping a drug)

Relevant side effects, recommended control parameters, dosing information and pharmacokinetic data (Q_0 , V_d , $t_{1/2}$) were searched in the following manuals and internet sites:

- Arzneimittelkompendium der Schweiz 2007
- www.dosing.de
- Berthold H. Klinikleitfaden Arzneimitteltherapie 1999
- Therapie-Profil für die Kitteltasche 2003, WVG Stuttgart

Results:

Information on frequency of laboratory controls was sparse, as well as information on monitoring of rare but serious side effects like hepatitis. Recommendations for frequency of monitoring were therefore often a compromise. Drugs eliminated mainly by the kidneys ($Q_0 < 0.5$) and needing dose adaptation in renal failure were marked in the table (see table below). Most drugs require a careful dose titration, for example beta blockers, antidepressants, antipsychotic, antiepileptic, and anti-Parkinson drugs. Interactions were not considered, because they are so numerous. Instead, we added a table with substrates, inductors and inhibitors of cytochrome P450.

Präparat	Wirkstoffe	UAW	Massnahmen
	Herz-Kreislauf		
	ACE-Hemmer		
Reniten	<i>Enalapril</i> : Wird hauptsächlich über die Niere ausgeschieden ($Q_0=0.3$) ³⁾	<ul style="list-style-type: none"> - trockener Reizhusten¹⁾ - symptomat. Hypotonie zu Beginn der Therapie¹⁾ - Verschlechterung vorbestehender Nierenfunktionsstörung¹⁾ 	<ul style="list-style-type: none"> - Blutdruck & Puls kontrollieren - Nierenfunktion überwachen!¹⁾ - Natrium und Kalium kontrollieren!
Zestril	<i>Lisinopril</i> : Wird hauptsächlich über die Niere ausgeschieden ($Q_0=0.3$) ³⁾	<ul style="list-style-type: none"> - Muskel- und Gelenkschmerzen, Schwindel, Kopfschmerzen¹⁾ - Müdigkeit (durch Blutdruckabfall)¹⁾ - Geschmacksstörung (< als 3%), Mundtrockenheit¹⁾ - Sehr selten Thrombopenie und Leukopenie²⁾ - Sehr selten Angioneurotisches Ödem²⁾ 	<ul style="list-style-type: none"> - (Leberfunktion kontrollieren) - (Blutbildkontrolle mit Hämatokrit)

Discussion/ Conclusions :

Implementation of such recommendations will be facilitated by an electronic prescribing system. Various automatic features could be included in such an electronic system:

- drug – drug interaction check
- drug – disease interactions check (“contraindications”)
- dose verification system (by including dosing limits)
- warnings and suggestions for dose adaptation (e.g. in case of renal failure)
- links to official or institutional drug information files (e.g. compendium)

Other measures to assure a safer drug therapy include:

- => non prescribing of risky drugs (for example by using restricted rational drug formularies)
- => minimizing the number of drugs per patient
- => regular visits with a trained pharmacist or expert in clinical pharmacology

