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Drug Interactions During Three Decades

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Abstract

Physicians may inadvertently prescribe improper combinations of drugs. Changes in the epidemiological panorama of potential drug interactions were studied during three decades, from 1983 to 2003. During the study period polypharmacy increased with 61%. Overall, potential drug interactions increased (relative risk 1.177 95% confidence interval 1.104-1.256), although the more severe interactions decreased (relative risk 0.714 95% confidence interval 0.587-0.868). Potential drug interactions and polypharmacy among the elderly should be closely monitored.

Keywords:

community pharmacy services; decision making, computer-assisted; drug interactions

Introduction

As long as mankind has used plants, animals and inorganic substances to cure and alleviate health disorders, drugs have probably been used in combinations to potentiate their intended effects. It may be favourable to use a combination of drugs if the combination is well documented to enhance the effect or to reduce adverse effects. However, it has been shown that physicians may inadvertently prescribe improper combinations resulting in less effect or more adverse drug reactions [1]. The present study was conducted in order to make an analysis on changes in the epidemiological panorama of potential drug interactions during three decades, from 1983 to 2003.

Materials and methods

The prescriptions from all individuals (n=8,318; 8,726; 8,214) with two or more prescriptions during three periods of fifteen months, October to December 1983-84, 1993-94 and 2003-2004, were collected from an ongoing cohort study in the county of Jämtland [2]. The potential interactions were detected by a computerized system and classified according to clinical relevance (types A–D), type D being the most severe [3].

Results

The relative risk of receiving potentially interacting drugs increased for type C interactions (relative risk 1.177 95% confidence interval 1.104-1.256) and decreased for type D interactions (relative risk 0.714 95% confidence interval 0.587-0.868) from 1983-84 to 2003-04. The relative risk was positively correlated to the increase in polypharmacy and for the more severe type D interactions an exponential relationship was displayed. Polypharmacy for included subjects increased over time with 61%, from 9.05 filled prescriptions per subject in 1983-84 to 10.6 in 1993-94 and 14.6 in 2003-04.

Discussion

To avoid drug interactions and adverse drug reactions prescribers should regularly check the patient's list of medication, computerized or not. The patient's age and number of medications are significant predictors of medication discrepancy. The toxicity of drug combinations may sometimes be synergistic and be greater than the sum of the risks of toxicity of either agent used alone. Screening for drug interactions should include all medication, both for inpatients and outpatients, nursing homes included. To ensure effective partnership between different healthcare professionals and the patient, good communication is essential both technically and, not at least, personally [4].

The present study was conducted in year 2005, prior to the new Swedish legislation introducing two new national databases for which the Jämtland cohort has served as a model. The Swedish National Prescribed Drug Register is intended for statistical, epidemiological, and scientific purposes, whereby drug and disease associations and the risks, benefits, effectiveness, and health economical effects of drug use may be explored [5].

For clinical purposes the equivalent information is made available by the new Swedish National Pharmacy Register, which provides prescription dispensing information for the majority of the population with the objective to improve drug utilization. The medication history in the register may be accessed online by registered individuals, prescribers,

and pharmacists. Different systems for electronic health care records contain functionality for automated detection of drug interactions. These prescribing systems should be linked to the National Pharmacy Register in order to alert physicians at the point of care not to prescribe any inappropriate drugs (or duplicates) in combination with drugs already prescribed by other physicians and filled by the patient at pharmacy [6].

The advantages of the new databases compared to the Jämtland cohort are obvious; the new databases are mandatory, comprising all individuals filling prescriptions on a national level, probably constituting one of the largest and most comprehensive prescription databases in the world. To further develop these databases, exposure to drugs within hospitals and over-the-counter sales should be added. The Jämtland cohort may well be used for longitudinal studies, with its unique historical material [4].

Conclusion

Due to a pronounced increase in polypharmacy the reason for prescribers and pharmacists to be aware of drug interactions has grown over time. The risk of receiving potentially interacting drugs has increased for the type C interactions although it has decreased for the more severe type D interactions. This could be a result of changes in the market, more awareness among prescribers as well as introduced modules for interaction detection in electronic prescribing systems.

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