DRUG-DRUG INTERACTION DATABASES:

Sensitivity and Specificity to Detect Manifest Drug-Drug Interactions, Reliability Ratings and Management Strategies of Potential Drug-Drug Interactions

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Objectives

- To determine the specificity and sensitivity of **DRUG-DRUG INTERACTION (DDI)** databases to detect manifest DDIs which contributed to unplanned hospital admissions
- To compare DDI databases with regard to reliability ratings and severity categories
- To identify the most common management strategies of potential DDIs suggested by DDI databases

Methods

Design: cross-sectional study

Data source: electronic medical records

Setting: University Hospital Hradec Králové (Czech Republic)

Time period: August–November 2018

DDI databases: Micromedex, Lexicomp (via UpToDate)

Potential DDI: a DDI with at least moderate severity category identified in the medication history

Manifest DDI: a DDI with clinical manifestation related to the main or contributory reason of hospital admission with a Drug Interaction Probability Scale score of at least 2 points

Sensitivity: True Positive / (True Positive + False Negative)

Specificity: True Negative / (False Positive + True Negative)

Sensitivity and specificity were evaluated using DDI-related hospital admissions as a reference.

Preliminary results

Out of 1252 hospital admissions, 375 hospital admissions have been analyzed so far. 810 different potential DDI were identified either in Lexicomp or in Micromedex. 741 different potential DDIs were identified by Lexicomp and 427 different potential DDIs were identified by Micromedex. 324 different potential DDIs were identified by both DDI databases simultaneously.

Concerning the sensitivity and specificity of DDI databases to detect clinically manifest DDIs which were contributory factors for drug-related hospital admissions, Lexicomp appeared to be more sensitive while Micromedex appeared to be more specific.

With respect to severity categories, no contraindicated potential DDI was identified in the medication history of patients. The most common management strategies stated in DDI databases were all related to monitoring.

Regarding the reliability ratings of potential DDIs, the most common category was fair.

Reliability Ratings

Reliability rating stated in DDI database	Potential DDIs N	%
Micromedex	427	100
• excellent	39	9.1
• good	143	33.5
• fair	245	57.4
Lexicomp	741	100
• excellent	25	3.4
• good	201	27.1
• fair	506	68.3
• poor	9	1.2

Suggested Management Strategies

The most common management strategies stated in DDI databases	N
Blood pressure monitoring	576
Blood glucose monitoring	331
Monitoring of clinical effectiveness	266
Potassium monitoring	266
Heart rate monitoring	190

Severity Categories

Severity Category	Potential DDIs N	%
Micromedex	427	100
• major	235	55.0
• moderate	192	44.0
Lexicomp	741	100
• major	123	16.6
• moderate	618	83.4

Sensitivity and Specificity

DDI screening database	True Positive	False Positive	True Negative	False Negative	Sensitivity	Specificity
Lexicomp	27	1873	2611011	15	64%	99.92%
Micromedex	22	1280	2611313	20	52%	99.95%

Conclusion

The suggestion to avoid combination did not hit the top 10 suggested management strategies stated in the DDI databases.

The identified management strategies highlight that healthcare professionals must be involved in decision-making concerning the management of DDIs.

Limitations:

We were not able to access the causality of pharmacokinetic DDIs due to the cross-sectional design of this study. DDIs involving multiple medications could have overestimated the number of DDIs.

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Previous presentation:

Other outcomes of this study have already been presented elsewhere:

- EACPT Virtual Meeting 2021
- ESCP Symposium 2021