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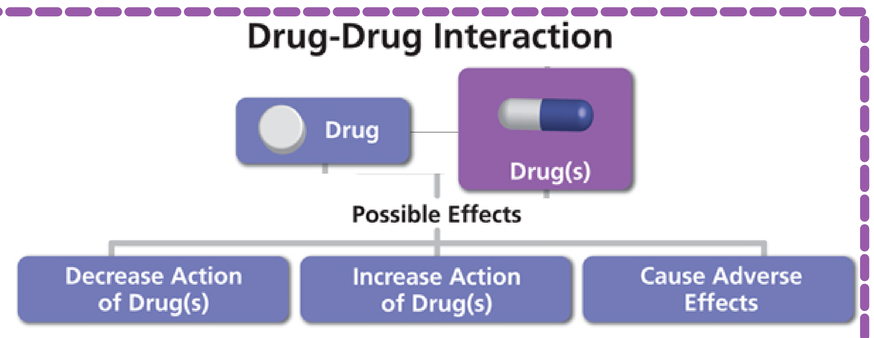
Drug-drug interactions and potentially related adverse clinical events in patients with cardiovascular diseases

Lo Surdo G (1), Volpi E (1), Zizevskikh M (1), Tonazzini S (1), Gini R (2), Roberto G (2), Antonazzo IC (2), Maffei S (3), Baroni M (4), Biagini S (1)
1-Hospital Pharmacy, Fondazione Toscana G. Monasterio, Heart Hospital, Massa, Italy; 2-Epidemiology unit, Regional Agency for Healthcare services of Tuscany, Florence, Italy; 3-Division of Clinical and Surgical Heart Diseases, Fondazione Toscana G Monasterio, Ospedale del Cuore, Massa, Italy; 4-Clinical Risk Manager, Fondazione Toscana G. Monasterio, Italy

BACKGROUND AND IMPORTANCE:

Several study estimated that about 60% of patients presents at least one potential Drug-drug interaction (DDI) at discharge.
Considering that DDIs are predictable issues, a review of DDIs conducted by pharmacist and physician would be ideal.



AIM AND OBJECTIVES:

The aim of this analysis was to measure the frequency and nature of DDIs in a cardiovascular units and investigate whether any adverse events after discharge could be associated to these DDIs.

MATERIALS AND METHOD:

This was an observational retrospective study, involving patients discharged between December 2016 and December 2017. The discharge medication list within the electronic medical record was used to determine the presence of Moderate or Severe DDIs at discharge. To check if any adverse events were associated with DDIs, we reviewed the causes of each hospitalization or access to the emergency department (ED) within 3 months after discharge.

RESULTS:

Among 2114 patients screened, 624 (29,5%) were exposed to at least one potential DDI. A total of 1108 DDIs were recorded, 834 (75,3%) were classified as moderate and 274 (24,7%) as severe. The median number of DDIs per patient was 1,8 (range 1-11).

Patients screened (n)	2114
Patients with interactions (n, %)	624 (29,5%)
Age (mean)	70,6
N. of drugs at discharge (n, mean)	16479 (7,8)
Patients with interactions (n=624)	
Patients with 1 DDI (n, %)	362 (58,0%)
Patients with 2 DDIs (n, %)	143 (22,9%)
Patients with 3 DDIs (n, %)	59 (9,5%)
Patients with >3 DDIs (n, %)	60 (9,6%)
DDIs	
Total DDIs (n)	1108
Moderate DDIs (n, %)	834 (75,3%)
Severe DDIs (n, %)	274 (24,7%)
N. of DDIs per patient	1,8

MOST FREQUENT SEVERE DDIs			
Drug1	Drug2	n. of DDIs (%) (n=274)	Possible effects
Furosemide	Paroxetine	47 (17,1%)	Increased risk of cardiotoxicity (QT prolongation and cardiac arrest)
Furosemide	Sertraline	37 (13,5%)	Increased risk of cardiotoxicity (QT prolongation and cardiac arrest)
Omeprazole	Clopidogrel	21 (7,7%)	Reduction of the antiplatelet activity of Clopidogrel
Furosemide	Citalopram	20 (7,3%)	Increased risk of cardiotoxicity (QT prolongation and cardiac arrest)
Ibuprofen	ASA	17 (6,2%)	Antagonism of the antiplatelet action of ASA.

MOST FREQUENT MODERATE DDIs			
Drug1	Drug2	n. of DDIs (%) (n=834)	Possible effects
Warfarin	ASA	85 (10,2%)	Increased risk of Factor II deficiency and warfarin associated hemorrhage
Spironolattone	Ramipril	45 (5,4%)	Hyperkalaemia; Increased risk of renal failure induced by the ACEi
Warfarin	Amiodarone	40 (4,8%)	Increased blood concentration of warfarin with high hemorrhagic risk
Paroxetine	ASA	30 (3,6%)	Increased risk of hemorrhagic events
Simvastatine	Warferin	30 (3,6%)	Increased anticoagulant effect of warfarin

3 MONTHS FOLLOW-UP DATA	
Data available for patients (n, %)	593 (95,0%)
Patients with ≥1 adverse clinical event (n, %)	144 (24,3%)
ADVERSE CLINICAL EVENTS (AEs)	
Total AEs (n)	212
Hospitalizations (n, %)	179 (84,4%)
ED accesses (n, %)	33 (15,6%)
AEs POTENTIALLY ASSOCIATED TO A DDIs	
Total AEs potentially associated to a DDIs (n, %)	32 (15,1%)
Hospitalizations potentially associated to a DDIs (n, %)	29 (13,7%)
ED accesses potentially associated to a DDIs (n, %)	3 (1,4%)

Of the 624 patients with at least one DDI, follow-up data were available for 593 (95.0%). Among them, 144 (24,3%) had at least one adverse clinical events within 3 months after discharge. A total of 212 events were recorded (hospitalizations= 179; ED accesses= 33). For approximately 15% of these events, the cause of hospitalization or ED access was potentially associated to a DDI.

CONCLUSION AND RELEVANCE:

From this analysis it emerged that a remarkable amount of patients has been discharged with at least one DDI and a considerable portion of the included patients might have experienced an adverse event due to these DDIs. The next step will be the involvement of a clinical pharmacist within a multidisciplinary team to highlight to the physician any potential DDIs before discharge and minimize the occurrence of their related risk.

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