Causation of potential drug to drug interactions alerts, alert overrides, and adverse drug events in critical cardiac patients

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Background: Drug-drug interactions (DDIs) leading to adverse drug events (ADEs) are of special interest because they represent preventable medication errors. Preventable ADE can result in errors involving the manifestation of adverse patient outcomes. Given the high complexity of critically ill cardiac patients, it is important to learn how Clinical Drug Decision Support System (CDDSS) affects outcomes in this population and the number of alerts that are likely to be safely suppressed.

Purpose: Identify adverse DDIs that are clinically detected and review the appropriateness of the doctor’s actions to the potential DDIs (PDDIs) alert.

Study Design: This is a prospective observational study conducted at a critical cardiac care unit (CCU) in a selected tertiary cardiac center for a duration of six months.

Methods: Physicians treating critically ill cardiac patients were presented with PDDIs data which were acquired from two commercially available CDDSS. The relationship between the decision to prescribe and factors hypothesized to affect physicians’ decisions was examined.

Results: Evaluation of 709 patient medication profiles were conducted, resulting in 521 assessed patient profiles having one or more PDDIs with 87% of them being influenced by polypharmacy. Ninety-one patients (17.5%) were associated with one or more adverse DDIs. Of the total 3284 potential DDIs alerts, 95.5% of the alerts were overridden. Preventable ADE as an outcome of inappropriate override has resulted in 83.1% (236/284) of adverse DDIs. Whereas appropriate overrides as an outcome of clinically irrelevant ADE were 16.9% (48/284).

Conclusion: Poor preventive actions taken by the doctors caused drug-related harm to the patients despite having CDDSS in place. This suggests that CDDSS is an important application to minimize the harm associated with adverse DDIs by alerting physicians of potentially unsafe situations.