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The Implementation and Evaluation of a Renal Function based Dosage Adjustment System in Seoul National University Bundang Hospital

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Abstract and objective

It is now widely accepted that the electronic medical record (EMR) coupled with clinical decision support systems (CDSS) is highly effective in reducing the frequency of medication error, thereby improving the safety of the patients. A number of important therapeutics agents are renally excreted from the body and, thus, a renal insufficiency of a patient is likely to necessitate the adjustment of the dosage for these agents. However, the implementation of such assistant function has not been reported nor evaluated in the literature for the case of CDSS. Therefore, the objective of the current study was to develop, implement and evaluate the renal function based dosage adjustment system in the CDSS, SNUBH

Keywords:

computerized prescription order entry,
renal dosing system, clinical decision support systems

Introduction

Seoul National University Bundang Hospital (SNUBH) represents one of the first medical institutions in Korea that has the full implementation of EMR-CDSS. The current system allows additional implementation of computerized prescription order entry (CPOE), e.g., CDSS for the identification of drug induced allergic reaction, drug-drug interaction, therapeutic duplication and assistant functions for the rationale prescription of antibiotics/anticancer agents. We were particularly interested in, if necessary, the provision of appropriate dosage and the dosing interval to the physician at the time of the completion of the order entry.

Methods

The Dosing guidelines were compiled for all medications used in our institution that are renally excreted. The guideline was then reviewed for the appropriateness by the physicians in the Departments of Nephrology and Infectious Diseases. The finalized guideline was then applied in the dosage adjustment system. Depending the availability of patients' measured creatinine clearance (Ccr) values, the system may use Cockcroft-Gault equation, if necessary for the evaluation of the renal insufficiency. Upon the completion of the order entry, the system checks for Ccr value of 50 mL/min or higher and the daily dose. Depending on the dosing guideline and the potential renal insufficiency, a warning message, along with the Ccr value and the relevant dosing guideline is real-time displayed. The system allows the physician to change or discontinue the order or ignore the alert to complete the order as it is.

Results

The current system is operational in our institution from the August of 2006. The initial evaluation has been completed and the system revised for the further reduction of the false positive alerts and the ratio for the override.

Conclusions

The current system may be practically useful in the improvement of the safety of the renal insufficient patients and the realization of the effective pharmacotherapy.

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