Qualitative Evaluation of the Supporting System for Diagnosis Procedure Combination Code Selection

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Abstract and Objective

In Japan, medical staff must select a diagnosis procedure combination (DPC) code for each inpatient upon admission. We report on the development and evaluation of a supporting system for DPC code selection. This system, based on a machine learning method developed by Okamoto et al., makes DPC code suggestions that are derived from medical practice information pertaining to inpatients. The use of the suggestions helps medical staff select an appropriate DPC code for each inpatient. We asked health information management professionals to evaluate the system and to compare the suggested DPC codes with those selected by doctors. They reported that the system was generally useful and that using this system they could find some cases of hospitalized patients whose DPC codes needed correction. However, they also determined the precision of the system needs improvement.

Keywords: Diagnosis-Related Groups, Clinical Coding, Hospital Information Systems, Questionnaires

Introduction

The Japanese government introduced a prospective medical fee payment system in 2003. In hospitals using this system, inpatient medical fees are determined based on a diagnosis group classification (DPC) system modeled after the diagnosis-related groups (DRGs) used in the United States. Because the inpatient medical fees are based on the DPC, medical staff must select an appropriate DPC code that corresponds to the pertinent details for each inpatient. However, selecting the correct DPC code is difficult since an inpatient may have a complex set of diseases [1]. The potential utility of an automatic DPC code selection system has been recognized, and methods to implement this have been studied [1, 2]. Suzuki et al. and Okamoto et al. attempted automatic DPC code selection based on discharge summaries and medical practice information, respectively. In this study, we report 1) the development of a supporting system that helps medical staff select appropriate DPC codes for inpatients, and 2) the questionnaire-based evaluation of this system.

Methods

Okamoto et al. [2] proposed a method for selecting tentative DPC codes for inpatients, using medical practice information, based on support vector machines. That is, the system uses accumulated inpatient medical practice data and correct DPC codes, and provides the user with DPC code suggestions for each new inpatient, based on their medical practice information. The system we developed utilizes this estimation method and provides potentially relevant DPC codes to medical staff. The system targets 1,880 DPC codes and treats over 8,000 kinds of medical practice information. In addition, the system displays disease names and operation names related to the suggested DPC codes, which helps medical staff make appropriate DPC code selections.

To evaluate the developed system, we asked four health information management (HIM) professionals to use it and then answer a questionnaire about its effectiveness. The utility of the system could be evaluated because HIM professionals routinely check the DPC codes that doctors have selected in the course of treating patients.

Results

The HIM professionals reported that they could find some cases of hospitalizations where the initial DPC codes needed correction. They also reported that the main diseases pertaining to the DPC codes were judged to be typically correct when they did not use the system, but some beneficial recategorization of main diseases were suggested by the system. Questionnaire data indicated that the operational speed of the system was sufficient for practical use. However, evaluation of the system’s precision elicited negative comments, such as the following: “The precision of the system needs improvement.”

Conclusions

We developed and evaluated a supporting system for DPC code selection. The evaluation showed that the system is generally effective, but development of a more useful system will require improving the precision of the DPC code selection. One potential method for improvement would be to combine the current machine learning system with a system using rule-based knowledge.

References