TITLE: Development of a support system for contrast-enhanced CT

PURPOSE

The factors determining dosage and conditions for injection of a contrast medium when a contrast-enhanced CT is performed include the region to be examined, age, gender, height and weight, renal function, or history of side effects caused by a contrast medium. However, there has been no system to manage and utilize all of the data in a unified fashion to date. In this study, we report the development of a system that shares the data with the Radiology Information System (RIS) and an automatic contrast medium injector to improve test quality and safety as well as the efficiency of the operation.

METHOD AND MATERIALS

The devices used were as follows: Dual Shot GX, an automatic contrast medium injector (Nemoto Kyorindo Co., Ltd.), DBOX EC, a contrast medium information gateway system (Resource One Inc.), RIS (Yokogawa Electric Corporation), DC-250, a body composition analyzer with height rod (Tanita Corporation), and Omnipaque, a syringe contrast medium preparation with IC tags (Daiichi Sankyo Co., Ltd.). These devices and systems were connected to the same network. The connection was based on communication by DICOM, MWM, and FTP with an emphasis on versatility. Creatinine level, eGFR, and history of side effects associated with the contrast media were constantly displayed on the settings screen of the automatic contrast medium injector.

RESULTS

More accurate determination of dosage of the contrast media than ever before was made possible through incorporating the data for height, weight, and lean body weight measured by the body composition analyzer immediately before the CT examination into the RIS. In addition, management of the creatinine level and the history of side effects caused by a contrast medium by the RIS and sharing of the data with the automatic contrast medium injector allowed the display of a warning on the settings screen of the injector if the renal function rose above the reference value or the patient had a history of side effects associated with the contrast media,

thereby improving overall safety.

CONCLUSION

Although some RISs used part of the necessary data, our new system made the contrast-enhanced CT safer and more efficient by managing and sharing all the data required for the examination.

CLINICAL RELEVANCE/APPLICATION

We developed a system that effectively utilizes the information required for a contrast-enhanced CT examination. As a result, determination of the most appropriate dosage of the contrast medium was achieved by obtaining accurate height, weight, and lean body weight. Furthermore, a safer and more efficient contrast-enhanced CT examination was possible by sharing the information on renal function and history of side effects associated with contrast media.