

A clinical database for networking in multicenter studies

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Motivation

Aim of this project was to develop a clinical database system for sharing of clinical information in multicenter research studies. The system should be flexible to store any kind of data and to enable the user to include any new parameter. It should also conform to data privacy regulations and should be accessible through the internet.

Methods

Programming was based on a web framework in Ruby on Rails. MySQL was used as database system. The complete software package is running on a virtual machine with Windows 7, which acts as a normal server.

Results

For storage of clinical information, two tables were defined. The first table contains all data in structured format, the second table harbors all information about the structure for each type of parameter. In detail, one or more values of a given parameter are linked to two different masterkeys and three different parameter keys. The masterkeys define the patient identity (patient-ID) and the time point of the visit. The parameter keys define the structure of tables (names of a table, a row, and a column), which can be generated by the user to store clinical information. As an example, a data structure for clinical information from patients with rheumatoid arthritis was established. In addition, a system of user and data specific rights was established to own and share data for reading, writing and administrating rights. Graphical user interfaces guide the user through administrative work (create or delete tables, rows and columns, share data) and data collection (enter new patients, visits, data values).

Conclusions

With the new database any kind of information can be stored including images. Every new parameter e.g. new tables, rows or columns can be added without programming knowledge. Many users can access at the same time from their own PC via an internet browser. Access is protected via user specific login and different levels of rights. Thus the database enables to collect data in the clinics, to share these with scientists, to enable biobanking, or sample tracking. The database is currently part of the national research network Arthromark (BMBF-funded), the EU-network NanoDiaRA (EU-funded) and the German-Singaporean collaboration DeSiNet-Rheuma (BMBF-IB-funded).