Characterization of the Knowledge Contained in Diagnostic Problem Oriented Clinical Practice Guidelines

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Abstract

Several data types (symptoms, signs, and tests) are gathered and used in the process of investigating a clinical problem. In this study, we aimed to quantitatively evaluate how often the knowledge contained in clinical practice guidelines refer to these data types, and to what extent evidence-based medicine principles are applied to them. To this end, we analyzed the knowledge contained in diagnostic problem-oriented guidelines using a set of relevant characteristics that we developed. We believe that the results of this study may be helpful for developers of clinical decision-support systems.

Background

Presenting clinical manifestations, such as symptoms or abnormal lab tests, are the starting point for clinical investigations. During the diagnostic process, physicians collect and analyze several types of data types, including subjective information acquired by questioning the patient (i.e., symptoms or medical history), objective findings obtained by performing physical examination (i.e., signs) and all sorts of laboratorial and imaging data. At any point in this process, there are several diagnoses that might fit the data collected (i.e., differential diagnosis), whose number should decrease as the diagnostic process progresses. As has already been shown years ago, expert clinicians can make a diagnosis in the vast majority of patients using the history and physical data alone1,2. Therefore, it is interesting to explore whether evidence-based medicine (EBM) instruments for aiding clinical diagnosis utilize these data types. Clinical practice guidelines (CPGs) are being advocated as a means to disseminate research findings, standardize care, improve quality of care, and increase the cost-effectiveness of services that are provided. Diagnostic CPGs that are meant to support the process of diagnosing a certain clinical problem are a subset of CPGs. In this study, we aimed to identify problem-oriented diagnostic CPGs and characterize their knowledge components. Specifically, we evaluated the extent to which they refer to each of the aforementioned data types.

Methods

We studied the CPGs that are stored in The National Guideline Clearinghouse™ (NGC) - a public resource for evidence-based clinical practice guidelines, initiated and maintained by the Agency for Healthcare Research and Quality and the US Department of Health and Human Services. We employed filtering features provided by NCG's website to consider only the potential diagnostic CPGs. We then manually inspected each guideline to see that it indeed addresses diagnosis of a presenting clinical manifestation. To characterize the knowledge contained in these diagnostic problem-oriented CPGs, we developed a set of 19 relevant quantitative characteristics. It includes the frequency of the various data types mentioned in each of the CPGs, and a quantitative evaluation of the usage of EBM measurements for each of the data types. The data was collected and arranged in a table for further statistical analysis.

Results

At the time at which the study was initiated, there were 1957 CPGs at the NGC website, of which 1182 were indexed by NGC in the diagnostic or evaluation category. After using the manual filtering mechanism, we ended up with 171 diagnostic problems-oriented CPGs. So far, we have characterized 25% of the CPGs. Preliminary results show a relatively low usage of medical history data (average of 6 symptoms per problem) with little usage of EBM data regarding its evoking strength for diagnoses.

Discussion

We believe that the results of this study may be helpful for developers of clinical decision-support systems in general and CPGs modelers specifically. First it is interesting for them to know whether the number of diagnostic problem-oriented CPGs is large enough to warrant development of decision-support systems for this particular CPGs category. In addition, the study is expected to yield better understanding of the knowledge component contained in this CPGs category. This may help in using and designing appropriate knowledge representation and decision models for this specific CPGs category.

References