



Does inappropriate selectivity in information use relate to diagnostic errors and patient harm? The diagnosis of patients with dyspnea



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ABSTRACT

Physicians often take shortcuts in diagnostic reasoning by being selective in the information that they gather and follow-up on. Although necessary, these shortcuts are susceptible to cognitive biases and may cause diagnostic errors. The aim of this study is to examine the occurrence of inappropriate selectivity in the information-gathering and information-processing stages of the diagnostic process and study how it relates to diagnostic errors and patient harm in clinical practice. Expert internists reviewed the patient records of 247 dyspnea patients of five acute-care hospitals in the Netherlands, to detect reasoning faults, diagnostic errors and patient harm. The cases with reasoning faults were discussed with the treating physicians. Based on the record review and the clarifications from the treating physicians, the occurrence of inappropriate selectivity in information-gathering and information-processing was established and related to the occurrence of diagnostic errors and patient harm. Inappropriate selectivity in the diagnostic reasoning process occurred in 45.7% (113 of 247) of the cases. Specifically, selective information-gathering occurred in 33.2% of the cases and selective information-processing in 12.6% of the cases. Diagnostic errors occurred in 18.3% of the cases with selective information-gathering, and in 35.5% of the cases with selective information-processing. Patient harm occurred in 11.0% of the cases with selective information-gathering and in 38.7% of the cases with selective information-processing. The results showed that inappropriate selectivity in the diagnostic process occurred in a substantial number of cases. Particularly inappropriate selective information-processing was related to diagnostic errors and patient harm. Prevention strategies should include an increase in promoting the falsification strategies in the diagnostic process.

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Introduction

The diagnostic reasoning process is a complex process that involves many different decision making skills. Since diagnostic errors are often considered to be preventable and severe, studying the diagnostic process to find ways to reduce diagnostic error is important (Baker et al., 2004; Leape et al., 1991; Zwaan et al., 2010). Many different factors are involved in the occurrence of diagnostic errors, such as lack of knowledge or atypical presentation of the disease (Kostopoulou, Mousoulis, & Delaney, 2009; Neale,

Woloshynowych, & Vincent, 2001; Schiff et al., 2009; Zwaan et al., 2010). In addition, research shows that in many cases in which a diagnostic error occurred, the physician did not consider the correct diagnosis from the start, which is often caused by cognitive biases (Berner & Graber, 2008; Croskerry, 2003; Elstein, 1999). Cognitive biases are faulty beliefs that affect decision making and occur because physicians use heuristics during the diagnostic process (Bornstein & Emler, 2001; Elstein, 1999; Tversky & Kahneman, 1974). Heuristics are shortcuts in the reasoning process, which means that not all available information is gathered or used to come to a diagnosis (Wegwarth, Gaissmaier, & Gigenrenzer, 2009). These heuristics are necessary to diagnose a patient within a reasonable amount of time and without conducting many unnecessary diagnostic tests. Heuristics are usually associated with fast diagnostic reasoning, and in most cases with correct diagnoses (Orient, 2009). Actually, the use of heuristics in the diagnostic

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process, can even lead to better diagnoses (Wegwarth et al., 2009). Particularly experts are able to diagnose a patient after gathering little data because they rely on the heuristic of pattern recognition (Groves, O'Rourke, & Alexander, 2003).

Although the use of heuristics is important in diagnostic reasoning, they may lead to faulty data-gathering, faulty data-synthesis and diagnostic errors (Graber, Franklin, & Gordon, 2005). For example, when the physician focuses on a specific diagnosis based on his/her recent experiences, and as a consequence does not adequately evaluate the evidence pointing towards alternatives (availability bias) (Berner & Graber, 2008; Berner, Maisiak, Heuderbert, & Young, Jr., 2003; Graber, 2005). Research showed that many cognitive biases occur in diagnostic reasoning and that they occur at all levels of expertise (Dubeau, Voytovich, & Rippey, 1986; Graber, Gordon, & Franklin, 2002; Redelmeier, 2005; Voytovich, Rippey, & Suffredini, 1985). The common denominator of most of the cognitive biases is that physicians are too selective in their reasoning process and therefore overlook likely diagnoses. This selectivity is inappropriate, which may result in a diagnostic error when relevant information is missed (Elstein, 1999). Inappropriate selectivity may have serious consequences depending on the stage of the diagnostic process in which it occurs and strategies to prevent inappropriate selectivity should be adapted to the specific stage (Croskerry, 2003; Kempainen, Migeon, & Wolf, 2003). Inappropriate selectivity in clinical practice and the situations in which it leads to diagnostic error and patient harm has not been studied extensively (Kostopoulou et al., 2009).

In our previously published study, we found that physicians often gathered insufficient information or lacked to follow-up on relevant findings (Zwaan, Thijs, Wagner, Van der Wal, & Timmermans, 2012). When we asked the physicians about these suboptimal decisions, we learned that most of these were deliberate decisions. However, we did not examine whether this was either due to a lack of knowledge or whether the physicians had been too selective throughout the process. Therefore, for this study we conducted further analysis on the data to determine: 1. the occurrence of inappropriate selectivity in the

information-gathering and information-processing stages of the diagnostic reasoning process of dyspnea patients, and 2. to what extent inappropriate selectivity in the diagnostic reasoning process is related to diagnostic error and patient harm in clinical practice.

Method

Patient record reviews in combination with interviews with the treating physicians were used to determine the occurrence of inappropriate selectivity, the stages of the process in which selectivity occurred and the occurrence of diagnostic error and patient harm. See Fig. 1 for an overview of the data-gathering process of the study.

Patient selection

Five acute care hospitals in the Netherlands (one university hospital, two tertiary teaching hospitals and two general hospitals) participated in the study. The start of the study was phased for practical reasons meaning that after the data-gathering process was set-up in one hospital, the next hospital started the inclusion of patients. The hospitals started about a month after each other and every hospital participated 6–8 months between May 2007 and February 2008. The study took place in seven departments of internal medicine, cardiology and pulmonology (in some hospitals the departments worked closely together and therefore both participated in the study). All eligible consecutive patients admitted to the hospital with dyspnea (shortness of breath) or who developed dyspnea during their hospital stay were recommended for inclusion by the treating physicians. Subsequently, a researcher (LZ) included the patients in the study by asking them for informed consent. By selecting dyspnea patients, we selected a homogenous patient group that has not been studied extensively in the field of diagnostic error. A total of 261 patients were included in the study of which 14 records were lost. Possible reasons for the missing records involve for example incorrect registration of the location of the patient record by the archive. Therefore, 247 patients are described in this study.

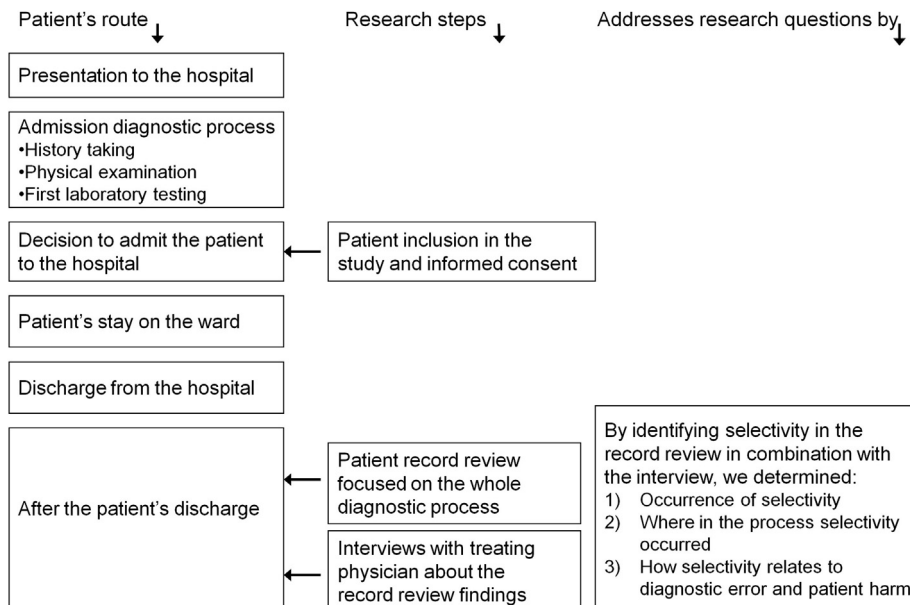


Fig. 1. Overview of the patient's route, the steps of the study and the addressed research questions.

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