Limitations in the Use of Qualitative Terms to Inform Diagnoses

The use of qualitative terms to describe the probability of disease is a potential source of misunderstanding and inaccuracy, and the use of probabilities has been a main supportive tool to deal with uncertainty in evidence-based diagnosis. Considering this, we have investigated how patients, medical students, and physicians quantify in probabilities the meaning of common terms used to indicate the presence of a disease.

Methods. In a public teaching hospital, volunteers who consented were invited to fill in a form marking in a metric rule (0% to 100%) the probability they would attribute to having a hypothesized medical condition for each of a series of randomly ordered words that represent probabilities (eg, “never,” “almost never,” “possible,” “likely”). These were checked by back translation to English. Additional covariates data were collected. Comparisons among subgroups were tested using the t test or analysis of variance and appropriate nonparametric tests. The survey was approved by a research ethics committee.

Results. During a period of 90 days, 167 participants (mean [SD] age, 36 [14] years; 52% male) were interviewed: 45 patients, 44 medical students, 41 medical residents, and 37 hospital practicing physicians, all from radiology, cardiology, and internal medicine wards. Of these, 14 patients were not able to adequately make the proposed quantitative transformation to fill in the form and so were excluded from the analysis.

The distribution of probabilities for each word in the valid sample (n = 153) is shown in the Figure. It is noteworthy that while words conveying ideas related to both extremes of probabilities showed narrower ranges of results, those representing intermediate probabilities showed a marked variability among responders. Moreover, no single term covered adequately the range of probabilities between 20% and 50%.

The mean (SD) probability of all answers was lower in the patients subgroup compared with others (45% [11%] vs 49% [4%]; P < .01). Patients’ answers tended to be lower in the intermediate range, ie, they attributed higher probabilities for “never,” “almost never,” and “unlikely,” and lower probabilities for “compatible with,” “likely,” “very likely,” and “certainly” (all P < .05). We found no significant differences when sample was stratified by sex, age, self-attributed health status, patient origin (inpatient/outpatient), or medical specialty.

Comment. We found a high degree of variability in the way language is used and interpreted to attribute probabilities, particularly in the intermediate range, potentially affecting health care provider–patient communication. This finding could, in some aspects, correctly represent the range of indeterminate results of diagnostic tests or, in the worst case, show a lack in formal medical diagnosis reasoning in common practice.

Patients’ answers tended to be lower than other groups, which could be inherent to the patient feelings and fears associated with the presence of disease. Furthermore, the very concept of probability of disease was flawed for some of them, representing a real barrier in communication.

Some study limitations should be addressed. Despite the back translation exercise, differences in results among countries and institutions could emerge from native language use and local practices. Subgroup analysis should also be viewed with caution owing to the limited sample size. Unfortunately, we could not go further in additional questions relating to specific cutoffs for each term, multicenter variability, or the reliability of answers.

Although findings such as ours have already been described for decades, no real improvement has been detected yet. We suggest testing a more restrictive categorization for the presence of a clinical condition, such as low, intermediate, and high probability. This would simplify the interpretation of results for both patients and physicians, as much as it would disclose the importance of different conditions.
Asthma is a serious public health problem, and suboptimal asthma management has been identified as an important cause of asthma morbidity. Physicians play a pivotal role in establishing asthma control, but there is considerable variation among physicians in their approach to asthma management that does not appear to be explained by differences in patient populations.

Effective management of asthma requires mastery of a number of interrelated physician skills. There is an increasing effort to directly teach these skills, particularly collaborative communication with patients, in medical school and specialty training programs. In 1993, Canada was the first country to require successful demonstration of clinical and communication skills on national medical licensure examination. The United States enacted the same requirement in 2005.

Our objective was to determine whether higher scores in medical knowledge and clinical and communication skills would be associated with the quality and outcomes of management for patients with poorly controlled asthma in the first 1 to 8 years in practice, after adjusting for differences in patient, physician, and practice characteristics.

Methods. A cohort was assembled comprising all physicians who took the national clinical skills licensing examination (Medical Council of Canada: Qualifying Examination Part II) between 1993 and 1996. For each physician, we used linked longitudinal patient histories from prescription and health services administrative data to assemble a dynamic cohort of all patients aged 5 to 60 years with a diagnosis of asthma between 1993 and 2003. We focused our analysis on patients whose asthma was out of control at the time of the first visit to study physicians in outpatient settings, based on excess use (>250 doses) of fast-acting β-agonists (fenoterol, terbutaline, and salbutamol) in the past 3 months. We excluded patients with a diagnosis of chronic obstructive pulmonary disease in the 12 months prior to the visit.

Each patient was followed up for 6 months after the first visit to a study physician for out-of-control asthma to assess (1) multiple emergency department (ED) visits with a primary diagnosis of respiratory-related conditions (International Classification of Diseases, Ninth Revision 490.x [bronchitis], 493.x [asthma], 465.9 [upper respiratory infection], 466.x [acute bronchitis], and 786.x [symptoms involving the respiratory system]) and (2) use of an inhaled corticosteroid (ICS) (fluticasone propionate, budenoside, flunisolide, beclomethasone dipropionate, and triamcinolone acetonide).

We used the generalized estimation equation extension of multivariable logistic regression for correlated data with an autoregressive first-order AR(1) correlation structure. Patients were the unit of analysis and were clustered within study physicians. In addition to physician characteristics (physician sex, specialty, examination scores), we adjusted for practice characteristics (practice workload and practice population profile) and patient characteristics (age, sex, socioeconomic status, number of visits to study physicians). Examination scores were standardized to have SD = 100, and the adjusted change in odds of a given outcome was estimated per 1 SD in the respective score.

Results. From 1993 to 2003, a total of 90,078 patients with asthma received care from 609 study physicians in an outpatient setting for respiratory-related conditions. Of these, 3,981 patients (4.4%) had out-of-control asthma at the first respiratory-related visit to study physicians, and 1,960 patients (2.2%) were prescribed asthma medication by the study physician at the visit.