

Opinion

Application of Peer Review in Investigating Allegations of Medical Negligence and Malpractice

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As an editor of a biomedical journal, “peer review” is one of the most important tools I use in my daily practice. I believe the key word in this term is “peer” which means “one that is of equal standing with another.”¹ And, “peer review” means “a process by which something proposed (as for research or publication) is evaluated by a group of experts in the appropriate field.”¹ Simply said, it means that we will ask a cardiologist to assess the suitability of a manuscript on cardiology and a neurologist to assess the merits for publication of a paper on neurology in our journal. Although it has several shortcomings, peer review is still the best available method used by editors of scientific journals to judge the merits for publication of submitted manuscripts.²

Having this background, recently I heard about a case of alleged medical negligence in which three general practitioners working in our health care center were accused. On three consecutive days, the physicians visited a 60-year-old lady who presented with right shoulder pain since a few days before. All of them, agreed a diagnosis of musculoskeletal pain and administered anti-inflammatory drugs. One of the physicians also requested an electrocardiogram (EKG), which was normal. A few days later, the patient died in hospital of myocardial infarction (MI). The general practitioners were found guilty by a panel of four cardiologists and subsequently sued. One of the cardiologists on the panel, after reviewing the last EKG trace of the patient taken in hospital, asserted that “the diagnosis is obvious—inferior wall MI; which can present in certain percentages of the patients as right shoulder pain.” Herein, I am not going to judge the general practitioners. The more important point, I believe, is the way those physicians were judged.

In different countries, there are different regulations for investigating allegations of medical negligence and malpractice. Putting it very simply, in Iran, in investigating the allegations, if the patient and the physician cannot reach an agreement outside the court system, the case is sent to a panel of specialists relevant to the field. The panel will examine the evidence and if deemed necessary will ask a

few questions of the defendant physician. Based on the professional verdict of this panel, if the defendant physician is found guilty, a judge in a court of law will then decide what the appropriate penalty should be. Although meticulous examination of the process in different countries needs an in-depth understanding of their legal systems and is surely beyond the scope of this short essay, I have learned, through several personal communications, that the whole process has many similarities in different countries and that the major difference from country to country is around their jurisprudence and the nature of the experts examining the case.

Returning back to our own case of right shoulder pain in a patient with inferior wall MI, after the main cause of death was recognized as MI, the file cover was labeled as “Cardiology” and referred for investigation to a panel of cardiologists. This kind of investigation reminds me of the opposition of many of my professors to dividing general medical wards into subspecialty wards. Their argument was that by doing so, the differential diagnostic list coming to the mind of a medical student entering those wards would be limited to only a few conditions apparent from the title of that ward; while in a general internal medicine ward one would expect to visit a vast variety of patients, in a neurology ward, the presence of a patient with acute leukemia or hemolytic-uremic syndrome would be totally unexpected. They believed that such partitioning of medicine would ultimately result in diminished diagnostic ability of medical students. Likewise, during the investigation of alleged medical negligence, when a file is labeled as “Cardiology,” it presupposes that the patient had not had any rheumatological, or neurological problems. The specialists on the panel are inclusively aware of that—why should a neurology case be referred to a cardiologist? The condition and the differential diagnosis list for the alleged physician were certainly different from those of the panelists. But, the story does not end here.

This situation is clearly relevant to a mathematical probability theorem stated by the famous 18th century English mathematician, Thomas Bayes, hence the name “Bayes’ theorem” or “Bayes’ rule.” This theorem describes the relation between a conditional probability and its reverse form and has many applications in all diagnostic procedures and

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tests.^{3,4} I am not going to explain it mathematically, but let me show it through an example which is not irrelevant to our case.

Suppose that a certain percentage, say 10%, of those who developed inferior wall MI experience right shoulder pain. In mathematical terms this statement reads “the (conditional) probability of right shoulder pain, given inferior wall MI in a patient, is 10%.” This statement, though it might be true, is completely useless in clinical settings where clinicians are looking for the reverse probability of “inferior wall MI in a patient, given the right shoulder pain.” This probability is clearly different from and certainly more useful than the former one. Bayes’ rule describes how we can calculate the latter probability given the former one. If you consider the “presence or absence” of right shoulder pain as the results of a diagnostic test for inferior wall MI, then the former probability (10%) is in fact the “sensitivity” of that test. As you know, sensitivity of a diagnostic test is “the probability of getting a positive test result (presence of right shoulder pain) given the disease (inferior wall MI).” No surprise, clinicians have never felt comfortable with using “sensitivity,” as practically, it does not help them at all. What they really are looking for is “the probability of a disease (inferior wall MI), given a positive test result (right shoulder pain),” an index of the so-called “positive predictive value (PPV).” PPV of a diagnostic test however not only depends on the sensitivity of that test but is also a function of the prevalence rate of the disease in question. Therefore, although the sensitivity of a test remains constant, because the prevalence of a disease varies from population to population, PPV of a test is different in different populations. As a consequence, given a positive test result, the differential diagnosis list, as well as the order of the disease conditions in the list coming to the mind of a physician may be completely different under different circumstances. For example, right shoulder pain would be interpreted as a sign of inferior wall MI by a cardiologist, bursitis of the right shoulder joint by a rheumatologist, and cholecystitis by a gastroenterologist. Although, in practice, no clinicians memorize the exact PPVs, through their work they implicitly learn the values. But, the experience of clinicians largely depends on the setting they are working in—the available facilities, diagnostic tests, prevalence of diseases, *etc.* Many specialists do not know in fact what is common or likely in the general population, because they never see it. They only know what is common in their patient population, which is one that has been selected by other physicians to be most likely in need of their services. This of course screens out the simpler and easier to treat cases, thus skewing the distribution of diseases. This becomes very evident in their use of testing, because as we all know on Bayesian principles—as explained earlier—a diagnostic test that might be useful and cost-effective in a population with a high prevalence of a disease, could be useless and even dangerous in one with

a low prevalence rate.

On account of all these dualities, I believe, to make a fair judgment, the expert panel investigating the allegation should ask themselves “what would a physician of similar qualifications do in similar circumstances?” Therefore, to judge an accused health care professional (physician, nurse, *etc.*) fairly, he or she should be judged by those in the same specialty and environment, and by a committee of his or her well-educated peers (not those different from him or her) blinded to the final diagnosis. The peers should be asked to visit a sham patient under a situation as much as possible similar to the setting where the accused person was working in, to see what they would have done if they had been in the shoes of the physician in question. This is exactly the extension of “peer review” to investigate allegations of medical negligence and malpractice. One limitation of such approach is that arranging to visit a sham patient in the same situation as the alleged practitioner did, although in theory is the best way to reproduce the chain of events happened, might not be possible in practice for most instances and perhaps, asking the peers to consider the conditions the practitioner was working in, would be fair enough to make an acceptable verdict. Another limitation would be to find appropriate peers where a specialty in a particular country is relatively small—say pediatric metabolic disease for example. Under such circumstance, all the senior clinicians in one country tend to know each other so would not be appropriate as judge or jury.

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Conflict of Interest

I have never been involved in any case of medical negligence or malpractice and have no conflict of interest.

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