POINT OF VIEW

Chance vs Probability in Medical Practice: Bhagavad Gita and Karma

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Abstract

As exhorted by the Bhagavad Gita, physicians do their best karma to manage a patient. The uncertainties and chance can never be altogether eliminated from medical practice despite using best practices because of inherent human and environmental variations. No management is perfect with a 100% probability of success in all cases. The outcome remains with him. The physicians and the patients need to be reminded of this limitation all the time.

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I recently came across an article in the *European Heart Journal* on the Bhagavad Gita and the conflict of burnout.[1] We all know that the Gita focuses on karma and not the outcome. This carries a great message for medical professionals who relentlessly work to improve human health, and the message has tremendous implications for not getting an adequate response in a particular patient despite adopting the most efficacious regimen for the treatment known to us. To understand this phenomenon, my first target was to search the literature for a treatment regimen with 100% efficacy. I could not find any. This is expected in view of unpredictable human variation and intricate environmental interactions. Epistemic uncertainties due to knowledge gaps are additional confounders that deny formulating a perfect regimen that works for all. Even if a regimen has 100% efficacy, the effectiveness in use may be lower because of cost and compliance issues. Thus, no regimen can deliver results with absolute certainty. Locating a regimen with >90% efficacy yielded many articles on vaccines but few on treatment regimens. Details of two of these treatment regimens with high efficacy are as follows.

da Costa et al.[2] carried out a meta-analysis of 192 trials comprising 1,02,829 participants of knee and hip osteoarthritis. These were on 90 different preparations. Five oral preparations (diclofenac 150 mg/day, etoricoxib 60 and 90 mg/day, and rofecoxib 25 and 50 mg/day) were found to have at least 99% probability of more pronounced treatment effects than the minimal clinically relevant reduction in pain. Rokkas et al.[3] meta-analyzed 68 eligible randomized controlled trials with 22,975 patients of *Helicobacter pylori* infection randomized to eight first-line regimens. Vonoprazan triple therapy and reverse hybrid therapy were found to have >90% cure rate.

When such impressive results are obtained after meta-analysis of several relevant studies, there is a high degree of confidence to use such therapies on almost all patients of that type. When such regimens do not give the desired results in some patients, there is a suspicion that something is wrong, even with such highly effective therapies. The catch is in the small percentages of cases in which the therapy was not found effective despite the meta-analysis that included such a large number of patients from different settings. Thus, it is not surprising that some patients do not respond the way a clinician expects on the basis of the available evidence. Efficacy is an aggregate indicator for a group of patients and transforms to probability in the context of individuals.

It is generally not possible to identify a patient in advance who would not respond. Chance plays a disruptive role. Statisticians define chance as comprising those factors which are either unknown or beyond human control.[4] Spiritually, the chance may be called the will of God. This varies from patient to patient depending on the quantum of faith one has. While discussing adverse outcomes in COVID-19 cases despite perseverance with the best available treatment, Samajdar et al.[5] aptly explained the importance of the often-ignored spiritual component of health in the context of lessons from the Gita. They also explored how spiritual beliefs can influence treatment decisions in diabetes management[6] and separately argue integration of spirituality into medical education.[7]

Chance, comprising unknown underlying conditions, idiopathic or idiosyncratic reactions, or unknown interactions beyond the ability of body to handle,[1] cannot be altogether avoided. The universal measure of chance is the statistical probability that is reflected in <100% efficacy and the *p*-values so prominently displayed while developing and evaluating the performance of various regimens in different subgroups of patients. Probability is an essential and vital component of medical practice.

A clinician does what best can be done for a patient as dictated by his or her acumen after the assessment of the condition of the patient, guided by the previous evidence. The evidence could be in the form of the literature or the accumulated experience and wisdom of the treating clinician for that kind of patient. That the available evidence may be inadequate is one thing, and the role of unknown or unanticipated factors is another. Thus, the outcome is not solely in the hands of the doctor. This is what the Bhagavad Gita teaches us. Do the Karma (duty) as best as you can and leave the result to destiny. Understand that other possibilities exist, however rare. Karma is in our hands, but the fruits are determined by a multitude of factors, many of which are not in our control. Probability plays a prominent role in medicine without our ever realizing it. This occurs perhaps because the unknown domain of medicine is still much more than the known domain. That brings humility in our endeavors when trying to provide the best relief to the patients. We must realize that, in some cases, epistemic uncertainties due to omnipresent incomplete knowledge can dominate the outcome. Clinicians and patients need to be continuously reminded of this limitation. However, a recurrence of treatment failure with high efficacy must set the alarm.

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