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Ancient Indian medical science and the cause-and-effect relationship in treating disease

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ABSTRACT

Modern science is not too fond of the theory of randomness or bad luck while explaining various phenomena. It looks for cause-and-effect relationships in every case. Thousands of years ago, the pioneers of the ancient medical science of Ayurveda grappled with the same puzzle – how much of an ailment could be attributed to a specific cause, and how much of it was random bad luck. While finding the root cause of disease is the underlying principle of every medical science, there is also the acknowledgement that unseen/unknown factors may also be at play. This reflects the limitations of human intellect while interpreting the world around us.

Keywords: ***Cancer, Random mutations, Ayurveda, Susrutasamhita, Carakasamhita***

INTRODUCTION

In January this year, Science published a report stating that many cancers are caused by the bad luck of random mutations (1). This finding hit the headlines around the world much to the annoyance bodies like **"The International Agency for Research on Cancer (IARC)"**, Cancer wing of World Health Organization. The IARC issued statements expressing disagreement with this finding which stated that environmental and lifestyle factors accounted for less than one-third of all cancers (2). Indeed, bad luck is not amenable to scientific research and defeats the efforts to identify causes of the disease that can be dealt with appropriate therapeutic strategies.

Researchers from the Johns Hopkins University, Baltimore had pointed out that in two-thirds of cancer tissue types, they had investigated the so-called bad luck of random mutations arising during DNA replication in normal cells could explain the occurrence of cancers. The controversy that ensued provoked the authors of the study to issue comments in Johns Hopkins University statement changing the reference from 'incidence' to 'risk'. Science also published follow-up column where clarifications were made regarding the controversial statements in the previously published article (3). The staff reporter of Science, Jennifer Couzin-Frankel also wrote an interesting column titled **"Bad luck and Cancer: A science reporter's reflections on a controversial story"** recounting her experiences in dealing with the controversy surrounding her article in Science (4).

The implications of these findings sound all the more frightening when it leads to the conclusion that most of these cancers cannot be prevented because they arise from bad luck. Does this means that there is no meaning in further research to identify the causes of cancer or that we should lose all hope of preventing this deadly disease? It need not be so.
Good science is built on understanding cause and effect relationship in nature. More accurate the understanding more is the possibility of developing interventions that can restore stability and normalcy. Understanding nature is quite difficult and perplexing indeed owing to its complexity. Heisenberg's uncertainty principle suggests an apparent randomness in nature (5). Einstein was not at all happy about its implications and was prompted to make the famous statement **"God does not play dice"** (6). Einstein was inclined to consider that uncertainty was only provisional and that there was an underlying reality and hidden variables that remained to be discovered.

DISCUSSION

There are interesting perspectives on cause and effect of theories in the tradition of **Ayurveda.** The ancient proponents of Ayurveda contemplated deeply on the natural phenomena and the laws that govern them. The **Susrutasamhita** sums up a spectrum of approaches that explain the natural laws behind the working of the Universe. The text points out that the great philosophers consider predictable **natural laws (syabhava), divine agency (isvara), time (kala), randomness/ chance (yadraccha), fate (niyati) and transformation/ change (prinamam)** as the cause for the manifestations and events that occur in our world – ***syabhavamisvaram kalam yadraccham niyatim tatha parinamam ca manyante prakritim prathudarsinah*** (7).

Yadraccha or randomness has been proposed as an explanation for the chain of cause and effects tha happen in the Universe. On the other hand, others hold the view that events unfold according to predictable natural laws **(syabhava).** These are the two viewpoints that are of particular interest to us.
There is a discussion in the **Carakasamhita** about the immutability of the knowledge of Ayurveda. The knowledge of Ayurveda is immutable to the extent that it reflects the nature of the phenomenon it defines **(syabhavasamsiddhalaksanatva)** because the natural laws are immutable themselves **(bhavasyabhabanityatva)** (8). While death due to natural causes is inevitable **(Kalamrityu),** there is always a scope for preventing **untimely death (Akalamrityu)** by human intervention based on the understanding of the natural laws (9).
In the context of the discussion on the nature of the **self (atman),** the Carakasamhita minces no words in dismissing the notion of a random universe where events unfold based on chance – ***nastikasyasti naivatma yadracchopahatatmanah*** – for those whose minds are deluded by the idea of randomness, there is no **self (underlying reality)** (10).
It is difficult to determine whether **syabhavavada (theory of natural laws)** overshadowed the other viewpoints in the development and evolution of the thought process of Ayurveda. It is quite probable that multiple schools of thought co-existed and dominated in different periods of time but we do find the thread of such an approach being woven into a fabric of a rational approach to healing in the tradition of Ayurveda. Vagbhata points out that effect reflect the nature of the cause – ***karananuvidhayitavat karyanam tatsyabhavata*** (11).
In the Carakasamhita, there is a discussion on the microcosmic level of reality where microcosmic events occur in fractions of a second – ***nimeskalatbhavanam kalah sighratarotyaye*** – that is, in one moment it exists and in the next moment it is gone (12). The text points out that there is a cause for the manifestation of these microcosmic events, but there is no cause for their dissolution. While dissolution is spontaneous, their manifestation has a cause and they do not occur randomly. Even when there is no apparent cause for the dissolution of the events, it has been proposed that the absence of the cause

for manifestation could be considered as the cause for dissolution itself – ***kecittratrapi manyante hetum hetoravartanam*** (13).

We can thus see that the entire thought process in Ayurveda is centered on discovery of the **hetu or cause** so that effective remedial measures can be discovered and developed. Therefore, Ayurveda is also known as **trisutra**, dealing with **hetu (cause - aetiology), linga (symptomatology)** and **ausadha (medicine)** (14). Treatment approaches therefore may either target the **cause (hetuviparita)** or the **effect (vyadhiviparita)** (15).

It does not appear that the proponents of Ayurveda believed that everything in nature could be explained on the basis of the cause and effect theory or that the humans can unravel the entire secret of cause and effect relationships. Therefore, we also find usage of terms such as **adrista (the unseen/ unknown factor)** (16) and **daivam (the unseen/ unknowable effects of past actions)** (17) implicating the complexity of the casual chain of events that may culminate in a particular effect. But it seems quite clearly that it was understood that the possibility of meaningful intervention in diseases depends on identification of the causes.

There are also discussions in the Carakasamhita about the complexity of the cause and effect relationships and the texts point out that one particular even may have a singular cause or multiple causes and similarly multiple events may be caused by a single cause or multiple causes – ***eko heturanekasya tathaikasyaika eva tu, vyadherekasya caneko bahunam bahavopi ca*** (18). Infact, the discovery that the events can have multiple causes led to the development of the concept of **yukti** as the corner stone of the principle of Ayurvedic treatment. Yukti is the application of the intelligence aimed at unraveling the **multiple causes (bahukarana)** working behind an incident and enables the physician to address the problem at these multiple levels to bring about a cure – ***buddhih pasyati ya bhavan bahukaranayogajan yuktistrikala sa jneya*** (19) and ***siddhir yuktaupratisthita*** (20).

In the section dealing with **diagnostics (nidanasthana)**, the Carakasamhita concludes that both disease and health are dependent on the operation of specific causes. Both health and disease cease to be when the underlying causative factors cease to be – ***vikara prakrtiscaiva dyayam sarvam samasatah, taddhetuvasagam hetorabhavannanuvartate*** (21).

CONCLUSION

Perception of randomness as a cause reflects the limitation of the human intellect. The goal of good science is to make possible human **interventions (purusakara)** (22) to tackle problems such as diseases that challenge human life. Even if we are unable to unravel the causative mechanisms in all instances, the hunt has to continue perpetually.

The confrontation with the complexity of the nature is a perennial challenge for human race, be it in the laboratories of the Johns Hopkins University in our own times or the lush green valleys of the Himalayas as many thousands of years ago.

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