

“BASIC SCIENCE: A TOOL TO UNDERSTAND KRIYA SHARIR”***Dr. Avinash Tiwari**

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ABSTRACT

It is said that for advancement of any discipline there is a need of constant revision of subject matter. For the same central council of Indian medicine has implemented a 5½ year BAMS course for studying *Ayurvedic* science. *Sharir Kriya* (~Human Physiology) is added as a part of UG syllabus so that student of *Ayurveda* can learn the ancient concept of Human physiology. Furthermore to aid precise knowledge of the subject basic/contemporary science was included in their UG and PG syllabus. In present era basic science is considered as “any one of the sciences such as anatomy, physiology etc. fundamental to the study of medicine”. In *Ayurveda* education system traditional systems of medicine and contemporary science are taught side by side. Understanding Ama with free radical, Sapta Dhatu with stem cell

theory are many such examples which proves that basic science can serve as a tool to understand *Kriya Sharir*. Basic Science of both *Ayurveda* and contemporary science can play role of a key to unleash/unlock the never-ending knowledge. Conclusively it can be opined that presently *Ayurveda* needs basic science as a tool for new invention, discoveries and as well as development of *Kriya Sharir*.

KEYWORDS: Basic science, Kriya Sharir, Tool.

INTRODUCTION

Ayurveda is an age old Indian system of medicine which requires scientific evaluation in present era for global propagation.^[1] It is opine that advancement of scientific methodology and technological innovation provides deeper understanding science and give rise to new ideas. It is said that for advancement of any discipline there is a need of constant revision of subject matter. *Charaka Samhita* is a classical example of such revision where *Acharya*

Caraka edited *Agnivesh Tantra* and renamed it *Charaka Samhita*. This redaction helped in valuable addition to the subject matter.

Since many years government authorities have been working continuously for revitalization, revision and development of *Ayurveda*. To accomplish the same Central Council of Indian Medicine (CCIM) was established through Indian Medicine Central Council Act of 1970 to revitalize, regulate and monitors the matters related to *Ayurveda* education in India. This government body has implemented a 5½ year BAMS course for studying *Ayurvedic* science. *Sharir Kriya* (~Human Physiology) is added as a part of UG syllabus so that student of *Ayurveda* can learn the ancient concept of Human physiology. Furthermore to aid precise knowledge of the subject basic/contemporary science was included in their UG and PG syllabus. In present era basic science is considered as “any one of the sciences (such as anatomy, physiology, bacteriology, pathology, or biochemistry) fundamental to the study of medicine”.^[2] Present article is an attempt to find out how basic science can serve as a tool to understand *Kriya Sharir*”.

MATERIALS AND METHODS

Data has been collected from various classical and contemporary texts, magazines and research articles available online relevant to the topic.

RESULTS AND DISCUSSION

History and Current Perspective of *Kriya Sharir* education in India:- According to the gazette issued on 31 may 1986 *Kriya Sharir* (~Human Physiology) is one among the important subject in syllabus of second year of main course of *Ayurveda* studies. Later an amended version of said gazette came into existence on 1st day of July 1989 where *Kriya Sharir* subject is shifted to first professional (duration one and half year). In year 2012 one more gazette published according to that one half year professional system is amended to year system in which *Kriya Sharir* remained in first year of UG (BAMS) and it is continued till date.^[3]

Basic science and *Kriya Sharir*:- “Basic science” is really “fundamental science” — it is the science at the heart of human knowledge.^[4] Some scientists devote their entire lives to understanding and describing key experimental phenomena in their fields of study: that is, they engage in “Basic Science”. Physicists may want to understand how matter and forces interact and to describe the fundamental laws that govern their interactions. Biologists and

medical scientists may want to understand how cells develop to form entire organisms, how they communicate and defend themselves.^[5]

Basic sciences to understand *Ayurveda* completely includes *Panini Vyakaran*, *Darshana* and *Tarka Samgraha* without application of these three we cannot get complete knowledge of our *Shashtra*. Indian teachings, Philosophy and tradition are always an apprehensive and unique approach which differs from western school of thoughts though in spite of similarities yet they differ through their approach. It's like a two faces of a coin, it is useless if either of the face is absent or distorted.

If we look towards the sequential development in history of *Ayurveda* in past decades after the independence, *Ayurvedic* scholars included contemporary subjects in their syllabus; to incorporate evidence based study in subject specific. *Acharya Sushruta* also mentioned that one cannot accomplish study of *Ayurvedic* medicine without the study of contemporary knowledge.^[6] It seems that *Acharyas* also felt that there is a need of studying of basic science without which knowledge is incomplete. In present era also scholars felt the need of basic/contemporary science such as Physics, Chemistry, biology, Anatomy and physiology are necessary to study *Kriya sharir*. These subjects enable scholars to comprehend *Ayurvedic* literature in a manner which is compatible with today's modern era. For instance the student entering in first year of BAMS has been taught basic concept of *Kriya Sharir* along with Human Physiology so in future he can use this in his clinical practice and also it create interest and curiosity among student that our age old science is still valid even if it comes to contemporary knowledge.

Below are some of the examples how basic science (Physics, Chemistry, Biology Mathematics etc.) can act as tool in understanding *Ayurvedic concepts*.

Correlation of concept of *Ama* and free radical theory: - In this theory scholars tried to explain the to *Ama* with the help of free radicals Theory because both of them are cause for production of diseases. The process of *Sancaya*, *Prakopa*, *Prasara*, till *Bhedavastha* of *Vyadhi* was correlated with impaired action of F. R. Scavengers, Increased production of F. Rs. till production of disease. Which suggest that how knowledge of basic science such as chemistry helps in understanding our concepts?.^[7]

Concept of Ahara Paka and Diffusion of Digested nutrients: In contemporary texts it is mentioned that Digested nutrients pass into the blood vessels in the wall of the intestine through a process of diffusion. This theory helps student to understand the *Ahara paka* (digestion process). *Acharya Charaka* explains that after the completion of the digestive process in *Amashaya*(~place where undigested food materials reside), the *Ahara Rasa* (digested nutrients) reaches all parts of the body through the *Dhamani*(~Artery).^[8]

Biology and Sapta Dhatu Theory- *Dr Kishore patawardhan* correlated the theory of Cell division with theory of *Parmanu* explained by *Acharya Charaka*.^[10] Furthermore Till the establishment of stem cell theories descriptions/claims of *Ayurveda* seems unscientific. Scientific applicability of *Sapta Dhatu* is well understood if studied the concept of *Saptadhatu* in the lines of stem cells.^[9]

Genetics and Prakruti – TRISUTRA (Translational Research and Innovative science trough Ayurveda) project of CSIR- Institute of Genomics and Integrative biology, Delhi is a milestone research project of government of India to study *Prakruti* on genetic level. *Prakruti* which was a mystery till now with the efforts of research team of TRISUTRA begins to unfold. They are trying to relate the science of genetics to the *Prakruti* for individualize medicine (*Pratipurusha Siddhanta*).^[11]

Pramana, and Mathematics - Mathematics is followed in India since Vedic Kala and discovery of Shoonya(Zero) was a milestone in history of mathematics, in *Kriya Sharir* measurement of various Dhatus are given in form *Pramana*^[12] which was used to calculate different units such as volume, weight etc. but sometimes it lacks accurate or standard calculation such as *Anjali Pramana*, etc, but in present day globally accepted international units are used instead of *pramana/Mana* because these are more standard and accurate and more over they are more useful in calculating dose in research work.(e.g. human dose conversion to animal dose with the help of *Pagets and Burns Table*).

Physics and Kriya Sharir – *Ayurveda Achayryas* have mentioned various types of examination for assessment of *Shudha Dhatus*, a classical example is *Shudha Shukra*.^[13] If a scholar want to explore *Shukra Dhatu* through textual references than he/she has to restrict their self to organoleptic examination only e.g. *Varna* (color), *Gandha* (Smell), *Rasa* (Taste) etc. but with the help of microscopic study one can explore and understand it deeply such as *Count(Mana)*, motility etc. In today's era when *Ayurveda* is globalizing due to its various

researches modern tools working on fundamentals of physics help us in analyzing various components of the body such as study of *Rakta* through Hb% estimation by Colorimeter and Sahli's haemoglobinometer etc. furthermore After learning classical organoleptic description of *Prakrut Mala* and *Mootra* (Stool and Urine) students are also taught routine and microscopic examination of mala (Stool) and *Mootra* (urine) which enables them to identify any *Vikruti* during their clinical practice.

In present era *Ayurveda* education system traditional systems of medicine and contemporary science are taught side by side. One can adopt the "Bilateral Education" model where student of Indian medicine can be taught by the experts from the other institution such as Physiologists from modern stream so they can impart more knowledge and understanding towards subject.^[14] In the year 1958, *Udupa* also recommended strongly that there is a necessity of addition of relevant contents from contemporary medical physiology and anatomy to fill up the gaps left in *Ayurveda science*.^[15]

But some scholars opine that though several topics from contemporary medical science ('modern medicine') are included in the syllabi of graduate curriculum of *Ayurveda*, no specific thrust has been placed on 'integrating' the two sciences. The curriculum prescribed by Central Council of Indian Medicine (CCIM) lists out the topics from the two different streams of science under different papers and sections discretely.^[16] This split is evident with the subjects such as anatomy and physiology. This type of learning poses as a threat because students might fail to links between the two sciences and the links between 'theory' and 'application' of the subject.

Present era is of science and it believes in thing which are scientific and evidence based. To develop *Ayurveda* science modern tools of basic science can play an important role in increasing the efficacy and accuracy of our science. Modern investigation tools such as microscope, haemocytometer, spirometer, chemical examination in labs etc. provide precise knowledge to scholars of Indian medicine.

Even if we look towards research areas in field of *Ayurveda* one cannot deny the ultimate need of basic science knowledge without which it's almost impossible to perform any kind of research work because basics of *Ayurveda* are entirely different than that of Contemporary science. Use of physics in forms instruments (Plathysmometer, spectrometer etc). Chemistry and biology as to study and standardization of herbal drugs plays a key role in proper

understanding of our concepts. The practical integration of Alternative medicine (CAM) with the contemporary medicine is receiving good response in countries like Germany, Italy, etc.^[17-19]

Further the study basic science of *Ayurveda* such as *Panini Vyakarna*, (Sanskrit Grammar), *Darshana* (Indian Philosophical Thoughts/materialistic science) and *Tarka* (application of intellect) are essential and needs to be uplifted. Because most of the concepts/Principles of *Ayurveda* are borrowed by the *Darshanas* only like – *Srushti Utpatti Krama*, *Pancha Mahabhoota* theory, *Lok Purusha Samyata* Theory etc. Proper learning of Sanskrit help us in decoding the most valuable *Shlokas* in a simple understandable manner and unfolds the multiple meaning. And through this we can have better understanding the concepts of Anatomy, Physiology, and Pathology in our own way. This enables students to apply same in future as an *Ayurvedic* scholar.

CONCLUSION

Any science which doesn't have development may become stagnant and unacceptable but it doesn't mean that the subject of *Kriya Sharir* is not developed. One must not lose basic concepts of *Kriya Sharir* at the same time knowledge of basic science must be used wisely so that purity of our science is maintained. It should act as a spectacle which helps contemporary scientist to understand this ancient subject.

Basic Science of both *Ayurveda* and contemporary science can play role of a key to unleash/unlock the never-ending knowledge. As it is said that 'Necessity is mother of invention' so presently *Ayurveda* needs basic science as a tool for new invention, discoveries and as well as development of *Kriya Sharir*.

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