

Dr. Sharadini Dahanukar

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Dr. Sharadini Arun Dahanukar (1945-2002)

Good research comes from a dedicated and determined person working in a supportive environment, the Department of Pharmacology and Therapeutics at Seth G S Medical College and K E M Hospital provided such environment in ample measure—both for experimental and clinical work. It all started, long back when Prof. Roger A Lewis (1953–1956) deputed by the WHO, headed the department. He started interaction of the Department of Pharmacology with Clinical specialties in the hospital. All subsequent heads took the mantle forward. However, Clinical Pharmacology as a Unit was developed by Prof. UK Sheth in 1962, when Dr Ashok Vaidya joined the Department. Dr Dilip Mehta had earlier returned from USA after training with Prof Harry Gold at Cornell University in Human Pharmacology of diuretics. That set the pace of both basic and clinical research on new molecules. Excellent opportunities were evolved with well-

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equipped laboratories: Competence was built meticulously and plenty of examples of commitment fostered true research spirit in everyone who joined the department.

In early 1970s Dr Sharadini Dahanukar joined the department after completing her internship in Gynecology-Obstetrics in the USA. She was bright and enthusiastic right from her student days at Seth G S Medical College, and she carried the same zeal when she started her postgraduate studies. Besides training with Prof UK Sheth and Prof RS Satoskar, she had the initiative to get trained by Vd Veni Madhav Shastri Joshi, an eminent Ayurveda teacher and physician. Ms Dahanukar was good at Sanskrit language and had won the prestigious Jagannath Shankarsheth award at secondary school certificate examination. This knowledge assisted her referring to the classical texts of Ayurveda.

I would like to address her career in two periods: First from 1971 to 1989 when she worked closely with me and from 1989 to 2002 when she started working independently and carved a niche for herself.

The department had, apart from postgraduate programs in pharmacology, applied biology ones. This brought many students interested in doing master's degree by research to the department. This led to diverse interests in research areas, such as pharmaceuticals, bioavailability and bioequivalence, allergy and asthma, hepatoprotection by indigenous drugs, adaptogenic and immunomodulating drugs.

We were excited to work on stress-inducing models in experimental animals and established methodologies for producing stress, measuring and quantifying it, and evaluating actions of supposedly antistress agents. It was decided that we concentrate on infection-induced stress. Although infections take a large toll in all developing countries, including India, apart from antibiotics to kill the organisms or suppress their growth there is nothing more to offer. Until then the traditional system of medicine (predominantly Ayurveda) had little to offer in this condition.

We adopted an experimental model in rats for producing intra-abdominal sepsis by cecal ligation. On the 5th day

after surgery the ligated part of the cecum was observed for the presence of pus, evidence of gangrene, and formation of thick omental mass. The signs of peritonitis were evident in all operated animals right from 24 h postoperatively. The ligation leads to mixed infection with aerobes and anaerobes causing 50% mortality within 96 h in untreated groups of animals.

Any treatment with effective antimicrobials would reduce the progression of peritonitis and its sequelae. Phagocytosis of *Staphylococcus aureus* by macrophages was studied on the day of surgery and on the 5th day postsurgery. Similarly polymorphonuclear leukocyte (PMN) function was studied in some experiments. Various drugs were studied—known antibiotics, metronidazole, and other similar compounds. Then immunotherapeutic modulation by *Tinospora cordifolia* was studied in this model. Treatment with *T. cordifolia* was found to reduce the mortality comparable to that of a combination of metronidazole and gentamicin.

These studies and the promising results led us to the study of phagocytic and chemotactic function of human neutrophils in patients undergoing surgery, or suffering from tetanus and the effect of Indian medicinal plants as well as drugs, such as antibiotics, antitoxins, benzodiazepines, and analgin used in the management of tetanus.

We undertook the challenging work of trying to find if there are any good scientific correlates in modern medicine to classification of individuals by the well-known concept of “Prakriti.” This was possibly one of the earliest studies in this area. We had used multiple parameters, including blood chemistry. On cluster analysis we found 3 distinct clusters occurring according to Kapha, Vata, and Pitta with a circulating enzyme in the blood.

Dr. Dahanukar’s love for plants and her knowledge about them was exemplary. She knew innumerable remedies from the classical texts, experience of vaidyas, and also “Grandmother’s pouch.” She used them and tested their veracity whenever possible. One such plant was *Piper longum*. In Ayurveda texts its use in Asthma is mentioned, where the dry fruits are used for the prevention of asthmatic attacks. Dr.VB Athavale, a pediatrician, had successfully carried out long-term studies with a special formulation of *P. longum* (*Chansashtha prabari pippali*). We wanted to evaluate the efficacy of *P. longum* in experimental animals and to elucidate its likely mechanism of action. *P. longum* effectively reduced passive cutaneous anaphylaxis in rats, protected guinea pigs against antigen-induced bronchospasm, but did not have any effect on the total quantity of histamine in the lungs, trachea, and intestines, or the release of histamine on antigenic challenge.

We subsequently did study the efficacy of *P. longum* in childhood asthma. It is well known that the “house dust mite” (HDM) is clearly implicated in most cases of asthma; hence we wanted to do the sensitivity tests to HDM. We had to get HDM extract from abroad, but she pursued it and on getting the extract we proceeded with our study in pediatric population. At the end of 5 weeks of treatment all subjects showed improvement. Even after 1 year, a large majority of patients showed an excellent response, confirming the early reports of long-term relief by Athavale.

After 1989, with her capable students Drs Urmila Thatte and Nirmala Rege, her career flourished in the Ayurveda Research Center (ARC) at KEM Hospital. The ARC—a deviation from modern medicine, which had so far ruled supreme in this campus, gave real impetus and focus to what she loved and enjoyed—pursuit of understanding principles of Ayurveda and various aspects of therapeutics. Getting substantial financial assistance from various granting agencies, generating funds through sponsored research, capacity building through getting the right research personnel and developing training programs made ARC flourish.

Just glancing through the publications coming out of ARC’s work and the wide spectrum, which they cover, one is awestruck. There is work on safety and efficacy of *Azadirachta indica* in patients with second degree burns; *Embelica officinalis* as the richest source of vitamin C—a health boon; leech therapy for complicated varicose veins; antiendotoxin effect of *Tinospora cordifolia*—an experimental study in rats; effect of oral administration of *Terminalia chebula* on gastric emptying; *Embelica officinalis*—a novel therapy for acute pancreatitis—an experimental study; modulation of Kupffer cell activity by *Tinospora cordifolia* in liver damage; adaptogenic properties of 6 rasayana herbs used in Ayurvedic medicine—a review; immunostimulants in Ayurveda—a chapter in a book; polymorphonuclear and monocyte functions in measles; quantitation of antimicrobial activity of mononuclear phagocytes—an in vitro technique; and *shoola*—pain concepts from Ayurvedic school.

Some excellent work came out of close collaboration with the department of surgery of KEM Hospital. The publications like clinical prospects of *Tinospora cordifolia*; an immunomodulator plant; Can we do away with PTBD (Percutaneous Transhepatic Biliary Drainage); Immunotherapy with *Tinospora cordifolia*. A new lead in the management of obstructive jaundice; and Modulation of immunosuppression in obstructive jaundice by *Tinospora cordifolia*. The standardized formulation of this plant was evolved at Zandu Research Centre, with the help of Vd. Narendra Bhatt and Dr KM Parikh. Later on Merind

Karandikar: Dr Sharadini Dahanukar

took up the product and marketed it as Immumod™ (Tinocordin), which was eventually passed on to Wockhardt with the merger and acquisition of Merind.

Dr Dahanukar wrote with Urmila Thatte and Nirmala Rege five good review articles on Pharmacology in Ayurveda, including pharmacodynamics, pharmacotherapeutics, and adverse reactions to Ayurvedic drugs.

ARC was not only involved in research, but also in education and services. Starting training programs in methodology and techniques for experimental work was a part of these. Similarly, organizing Ayurveda Update, every 4 years, with a view to keep continuity was a laudable effort. Getting eminent speakers and participants from all over India added great value to the programs, which now researchers in the field look forward to eagerly. She created a good set up for offering “*Panchkarma*” as a well-accepted modality and an integral part of Ayurvedic therapeutics.

Based on my experience of 3 years of study at the prestigious Bajaj Institute of Management Studies (BIMS), Mumbai, I had started some projects in the hospital. I suggested to her, doing one of the management programs at the same institute, which would help her to become a good administrator in the years to come. She did a 1-year program in Financial Management. This helped her evolve as a dynamic Dean of Topiwala National Medical College and BYL Nair Hospital.

We had an unwritten understanding that whenever we think of doing any project, detailed planning including financial aspects and exercising control were my responsibilities while organization, management, and research activities would be looked after by her. She had very good people skills. This arrangement worked very well in doing simple to complex projects within the budget and within the time limits set.

In the mid-1970s we decided to undertake communication project in the hospital. In any big hospital, finding or contacting a person quickly is a great problem. We started with fixing the intercom system within the department itself, connecting all laboratories and senior staff members. It made life so much easier immediately. A much bigger problem was at the telephone operator's level, the telephone board that they had to manage with handheld instruments. There were a limited number of external telephone lines supplied by the Bombay Telephones. We took help from the Divisional Engineer and visited the Telephone Exchange. The solution implemented was dedicating 75% of lines for incoming calls and keeping the balance for use of employees within the hospital to contact people outside. Introducing headphones for operators eased their work.

All this we did when the telecommunication revolution was in the distant future.

In 1985 we took up work on the problems of the elderly. Where she had little interest and wanted to concentrate on her passion for research in Ayurveda. That decision of hers was amply rewarded when ARC was established.

Dr Dahanukar was given charge to look after trees, plants, and lawns in the campus. She took great interest in looking after the green areas, because she loved plants so dearly. She motivated the gardeners, looked after their welfare, and made visible changes in the greenery within the campus. She also developed a small garden of medicinal plants, in one of the corners of the rapidly constricting open spaces in the campus. She knew the value of such efforts in making a better environment.

She had a multifaceted personality. She took interest in Marathi literature, music, and drama. She lived a rich cultural and social life. She started the Marathi Literary Forum (Marathi Vangmay Mandal), which became very popular among students. She would get well-known literary figures, actors, and artists for the programs using her wide contacts.

She wrote many books, devoted to a wide array of subjects. Her book “*Ayurveda Revisited*” is very well acclaimed. She showed convincing relationship between modern medicine and Ayurvedic concepts and various processes and procedures followed in Ayurveda.

Her first book published was on plants in Marathi language and entitled “*Vrikshagaan*,” which won the State award and has been very popular among readers of Marathi literature. Her subjects for books varied from portraits of remarkable persons to specific regional cuisine. She wrote good poems and they were published in Marathi weeklies, all these qualities made her popular with staff and students. She could get into conversation with anybody in no time. She was invited to release the book, *Ayurvedic Pharmacology and Therapeutic Uses of Medicinal Plants*, a translation of Vd. VM Gogte's book on *Dravya Guna Vignyan*. Her comments were thought provoking and enthused young researchers to commit themselves to scientific research in Ayurveda.

Subsequently, she was part of the Council of Scientific and Industrial Research project—New Millennium Indian Technology and Leadership Initiative for drug discovery from Ayurveda. Dr Mashelkar had heavily banked on her expertise for the project. But her untimely death at the age of 57 has been a loss to the modern research in Ayurveda; because her work could have unraveled many vexing ideas

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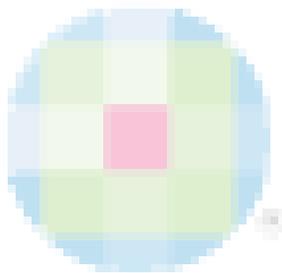
and concepts making Ayurveda more acceptable globally for Integrative Medicine.

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