Sir Upendra Nath Brahmachari

Contribution to Physiology & Allied Health Sciences

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Childhood & Education

Sir Upendra Nath Brahmachari was born in Jamalpur, Bihar, on 19th December 1873. His father Dr. Nilmoni Brahmachari was a doctor in the East Indian Railways at Jamalpur and his mother was Mrs. Sourav Sundari Devi.

Young Upendra Nath completed his school education at Eastern Railways Boy's High School at Jamalpur, then joined Hooghly College (presently known as Hooghly Mohsin College) and obtained his BA degree with honors in Mathematics and Chemistry in 1893. Next year, he obtained his Masters in Chemistry from the Presidency College, Calcutta.

Thereafter, he joined Calcutta Medical College and obtained Licentiate in medicine and surgery in 1899 and MB degree in 1900. He obtained his Doctor of Medicine degree in 1902 and Ph.D. in Physiology from the University of Calcutta in1904.

After completion of medical studies, he was appointed as a teacher of Physiology and Materia Medica at Dacca Medical School from 1901 to 1905. Then Dr. Brahmachari joined Campbell Medical School (currently Nil Ratan Sircar Medical College) and retired from Calcutta Medical College in 1927. After retirement, he joined Professor of Tropical Diseases at Carmichael Medical College, Calcutta.

Scientific achievements

Dr. Brahmachari made remarkable contributions to the field of biomedical sciences. One of his most outstanding works was the discovery of urea stibamine for the treatment of Kala-azar (a deadly protozoal disease transmitted by sandflies). The first epidemic of Kala-azar was reported from Assam in 1870 and spread to Bengal and Bihar along with the Brahmaputra and Gangetic planes. The disease claimed millions of lives, but the causal agent remained undiscovered till the end of the 18th century. In 1903, William Leishman and Charles Donovan discovered the pathogen independently from the autopsy material of two soldiers from Calcutta and Madras, respectively. Sir Ronald Ross named the parasite as *Leishmania donovani*.

During 1913–1915, Kala-azar was treated with intravenous injections of tartar emetic (potassium salt of antimonyl tartrate). Several disadvantages were reported due to prolonged use of tartar emetic which included cardiac and hepatic dysfunctions. Dr. Brahmachari attempted the use of sodium salt of antimonyl tartarate and showed better results than its potassium salt. Then, he started treating Kala-azar cases with powder and colloidal forms of metallic antimony, but it also had some disadvantages such as not being readily available, could not be stored, a tedious method of preparation, and complicated administration technique. Therefore, Dr. Brahmachari continued his research for better

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means of treatment of Kala-azar. During this time, Paul Ehrlich, a German physician and chemist, showed the effectiveness of atoxyl (sodium salt of para-amino arsenic acid) against sleeping sickness in 1905.

Dr. Brahmachari took inspiration from Ehrlich's work and paid his attention to replace the arsenic component of atoxyl with heavy metal antimony and used it for the treatment of Kala-azar patients. He continued his research with almost zero laboratory facilities at the Campbell Hospital and he was able to synthesize a new potent compound against Kala-azar named urea stibamine – the urea salt of para-amino phenyl stibnic acid in 1920. Using urea stibamine, Kala-azar mortality rate could be brought down to 10% by 1925 and it had a cure rate of 95%. This drug was used for the treatment of Kala-azar not only in India but also in Greece, France, and China for many years.

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Another remarkable discovery of Dr. Brahmachari in the field of Kala-azar was the identification of cutaneous leishmaniasis among Kalazar recovered patients. This cutaneous leishmaniasis was named as Brahmachari Leishmanoid or the present name post-kala-azar dermal leishmaniasis.

Dr. Brahmachari was nominated for the Nobel Prize in Medicine in 1929 and 1942. Unfortunately, he did not receive the Nobel Prize. Although Dr. Brahmachari is remembered for his work on Kala-azar, he also worked on many other diseases such as malaria, cerebrospinal meningitis, blackwater fever, leprosy, filariasis, influenza, syphilis and diabetes. He also established India's first blood bank at the Calcutta School of Tropical Medicine in 1935.

The eminent scientist breathed his last on 6th February 1946.

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