

A NOTE ON THE ANCIENT KNOWLEDGE ABOUT THE PREVENTION OF WATER BORNE EPIDEMICS :

By

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The disease cholera is described as Vishuchi in the Sanskrit literature. From the ancient medical literature concerning with epidemics, which cause devastating scourge, described as "Janapadodhawmsa" in "Charaka Samhita". It may not be possible to find a categorical expression of a defined microbe as the cause of epidemics. The ancient scientists observed that the water borne diseases could be prevented by consuming only boiled and cooled water especially in a rainy season. The words "Krimi", "Raksha-sha" represent "Bhutas" or microbes but they are not described as colonies on artificial culture media, nor any experimental infection of animals were attempted. While the ancient medical scientists are clear in their mind about the genesis of water borne epidemics, the scientists of nineteenth century have had entered into mere fringes about the origin of such diseases which are now classified as contagious diseases. There was no disagreement among the scientists of 19th century about the smallpox disease. There was a continuous acrimonious discussion on the nature of spread of cholera. Albeit the point made out by the "Localists" as opposed to the "Contangionists" is the airborne or soil factors for the maturation of the pathogenic propensities of vibrio. These imaginary epidemiological principles occupied most of the discussions carried by the then scientists, and delegates and medical administrators. Had it been possible to educate himself, Dr. J. M. Cunningham who was the then Surgeon General, of British India, on the points quoted by Charaka samhita, Sutrasthana, 6-39, "Mahendram Tapta Sitamcha, Kaupam Sarasamevacha", he would not have made erroneous statements which were quoted by Pettenkofer in the Seventh International Sanitary Conference, (1892 Venice) i. e. 8 years after the epoch making discovery of the vibrio cholera by Robert Koch. (1884). The statement was—"if boiling drinking and domestic water would protect against typhoid and cholera, it would be "childishly easy" to prevent epidemics. But because the origin of epidemics does not lie in drinking water, it is evident that boiling does nothing to help".

To comment on this one must be prepared to understand the prejudice entertained by Dr. J. M. Cunningham who whole heartedly championed the doctrine of Pettenkofer, who in turn never accepted the spread of cholera by water and the transmissibility, of the microbe from man to man unless the maturation factor was provided by the soil.

However, the simple observation that the cholera epidemics always followed the rains could not be well understood by the "Localists"—supporters of Pettenkofer's doctrines inspite of the fact that excellent epidemiological and microscopic studies were made by John Snow (1849) and Pacini (1854) respectively.

The spread of the disease cholera, according to the prevailing theories in 1850's may be stated as follows:— It is generally admitted in these days that the intestinal dejections of cholera patients contain at a certain stage, the propagating principle of the disease. This proposition was already formulated by Pollarin in 1849. But Bellarin thought erroneously that cholera was an intoxication produced by the absorption of one or several deleterious gases emanating from decomposing animal matter, especially that contained in latrines. He insisted even then on the necessity for disinfecting the dejecta with iron sulphate.

Pettankofer considers it to be proved by his observations that in an epidemic of cholera the soil itself of the area in which the disease prevails plays an important role in its development by the emanations that escape from it. It is thus that he believes that a porous soil easily permeable to air and water, by becoming impregnated with excrementitious matter, becomes first a receptacle and then according to the circumstances, a more or less active focus, from which the disease escapes. He maintains that the intensity of this escape of choleric matter, depends on the level of the ground waters and is consequently related to major or minor variations in the humidity of the superficial stratum of the soil.

The fundamental principles of spread of water borne epidemics, are already reflected in Sushruta Samhita,—Chapter 6 Sloka 11, which runs “Tatra varshaswos shadhayastarunyo alpa, veerya, Apascha prashantah, Kshiti mala Prayah”.

This sloka elucidates the idea that the soil gets contaminated with faecal material and gets washed in the rainy season, and thus the filth may be carried by the water. In the rainy season the water must be boiled and cooled before consuming the water for drinking purposes, as stated earlier in Charaka Samhita.

According to Pettenkofer who was also the Chairman of Cholera Commission of the German Empire 1873,—“Man was the most important agent for transmission of the disease and he may act as a healthy carrier. The circumstances of each case, which was ordered to be notified by the commission should be investigated with reference to topographical features, dwelling, dress, diet, occupation, sanitation, water supply etc. which is the essence of epidemiological investigation.” In that context, he maintained that a supply of pure drinking water was important, but no proof as yet existed that water could carry the cholera virus. In spite of this he used to deliver lectures, “The Value of Health to City” and was able to convince the Government in the matter of environmental health. He made important contributions to the hygiene of housing, to the sanitary disposal of human wastes, and to the provision of pure water supplies. Thus he brought down the then death rate which was of the order of 33 for 1,000. (Pettenkofer 1873).

His soil factor theory for the maturation of the pathogenesis of cholera germ, places him as a “centrist” between the “contagionist” group and “noncontagionist” group, and his followers are described as “localists”.

It is a matter of great satisfaction that although Dr. Max Von Pettenkofer, entertained the erroneous doctrine of soil factor—almost till his end, the same soil theory made him alive to the problems of open latrines and he used his energies in persuading the Governments for the prevention of contamination of the soil with the dejecta with the consequent danger to environmental health which can be prevented by instituting piped water supplies and sanitary disposal of human wastes.

It is but proper to pay homage to this great scientist who reasoned in his own imaginary way, for the development of drainage system and piped water supplies. In contrast, the Victorian England also implemented the principles of sanitary discharge of human wastes earlier under the able guidance of Chadwick, (1800–1890) and other experts like Florence Nightingale who simply believed that this piped supply of water helped in prevention of the cholera epidemics in some indefinable way. Thus England was free from cholera epidemics from 1865 onwards, the three decades ahead of other European countries. Only in 1869, Liber meister, stated “drinking water which appears even remotely suspicious ought to be consumed only when boiled and ought to be used in the same way for cleaning the eating utensils”. This is the earliest recorded advise on personal prophylaxis on cholera in the modern scientific literature.

ACKNOWLEDGMENTS.

The author is grateful for the able guidance and critical appraisal of the article by Dr. Raghunathan, Director of Indian Institute of History of Medicine, and to Dr. V. V. Subramanya Sastri, Gazetted Lecturer and Dr. Sreenivasa Rao, both of Govt. Ayurvedic College, Hyderabad for the necessary references in the ancient medical literature.

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