

Fighting zoonotic, rabies and public health in Colonial India

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Article Info

Article history:

Received Jun 13, 2019

Revised Aug 5, 2019

Accepted Aug 27, 2019

Keywords:

Anti-rabies vaccination

Hydrophobia

Rabies

Zoonotic

ABSTRACT

Rabies is the oldest Zoonotic diseases in the world and one of the most important Zoonotic diseases in India. It was one of the most difficult problems confronted both by the medical and veterinary authorities in colonial India. The disease is transmitted from animal to animal and from animal to man through saliva. More than 90 per cent of cases of human rabies are transmitted by dogs which was a major concern of public health. A few British officials and soldiers were bitten by dogs during the colonial period. As a result, they suffered from rabies. As ownerless dogs were infested all through the country, the disease prevailed largely at that time. Gradually, rabies became a problem to the colonial Government. Louis Pasteur obtained his first success against rabies through vaccination in 1885. At that time, Dr. Lingard, Bacteriologist, had proposed to introduce a system of anti-rabies vaccination in the Bacteriological laboratory at Poona. A similar proposal was also submitted by J.H.B. Hallen, a civil Surgeon in 1890. Later, five institutes were established in India for anti-rabies treatment. Gradually rabies patients were treated at pasture institute. Thus, this paper examines impact of rabies, treatment and veterinary public health policy in colonial India. The great Zoonotic waves of rabies that suffered public health in colonial India are also focus of this paper.

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1. INTRODUCTION

Rabies is the oldest Zoonotic disease in the world and one of the most important Zoonotic diseases in India. Rabies was first described over 4,000 years ago. Rabies is also popularly known as Hydrophobia in men. It was one of the most difficult problems confronted both by the medical and veterinary authorities in colonial India. The person who suffers from this disease feels tormented at the same time with thirst and fear of water. It affects the central nervous system of men and warm-blooded animals. The disease is transmitted from animal to animal and from animal to man through saliva. The disease primarily infects domestic and wild animals and is transmitted to humans through close contact with infected saliva via bites or scratches, mainly of dogs [1]. More than 90 per cent of cases of human rabies are transmitted by dogs which was a major concern of public health. Besides dog, rabies is transmitted by other wild animals and domestic animals such as jackal, monkey, mongoose, wolf, tiger, cat, cattle, sheep, goats, horses, and swine [2].

The germ of rabies travels through the nervous system. Dog bites a cow, and its injury to the nerves, the virus in the dog's saliva finds easy entrance. If the animal is bitten about the head, the disease will begin sooner than if bitten in the hind leg, because of the greater distance, the germ must travel to reach the brain. It is probable that not all bites are infective, because when the wound bleeds freely the virus may be washed away. When the virus enters the nerve at the point of the bitten wound, the symptoms develop only when the germ reaches the brain. Most cases of rabies would happen within three months after an animal was bitten [3].

1.1. Concept of rabies

The word 'rabies' is derived from the Latin word '*rabere*', which means to be mad, to rage, or to rave. The word might be having roots in a Sanskrit word *rabhas* that means to do violence [3]. The misconceptions and lack of awareness among health professionals, veterinarians, civic bodies and the public further aggravate the problem. It has been noted that most humans die due to rabies because they fail to get timely and appropriate post-exposure treatment, particularly in rural and remote areas in India. Many dog bites, especially in children, are either ignored or reported late which leads to completely missing the life-saving post-exposure treatment or delay in its administration. Incomplete and faulty treatment due to ignorance factors also compounds the problem [1].

For all practical purposes, the saliva is the only channel by which man or other animals contract rabies. The dog is the animal most frequently affected by this disease [4]. The milk of animals suffering from rabies has seldom been shown to contain the virus, which probably exists in the milk only in very high dilution, so that if no recent cuts or abrasions are present on the lips or mouth, this un-boiled milk could be drunk with impunity [4].

In the dog the symptoms are extremely variable. Sometimes the dogs shows furious symptoms and later on dies in a paralyzed state; at other times only paralysis is seen, more rarely the animal may only be restless and off its food and die within a few hours from convulsions [4]. Once the patient becomes symptomatic, treatment almost proves ineffective and mortality is over 99%. Rabies may also inflame the spinal cord, producing transverse myelitis [5].

1.2. Statement of the problem

Rabies was devastating disease in Colonial India. A few British officials and soldiers were bitten by dogs during the colonial period. As a result, they suffered from rabies. As ownerless dogs were infested all through the country, the disease prevailed largely at that time [6]. Gradually, rabies became a problem to the colonial Government. Dr. Alfred Lingard, Bacteriologist, Imperial Bacteriological Laboratory said to the Principal, College of Science, Poona about the unavailability of accurate statistics of mortality in India due to rabies. In a short period of his stay in Poona, he received several telegrams and in those advice for assistance had been asked for hydrophobia. Similar request had been made to him to supply and forward necessary remedies advocated by M. Pasteur. He further reported that several cases had been brought to his notice where British officers and soldiers were bitten by dogs. Among them, some were being sent to England for better treatment and the rest were left to their fate in India [6]. At that time there was no centralized agency for coordinated pathological research in India. Rabies infection in humans is still a major public health Problem all over the world [7]. Each year, more than 35,000 human rabies deaths and at least 6.5 million rabies post-exposure treatments are reported worldwide, mostly in Asian and African countries [8]. It is in this background, the present paper examines the impact of rabies, its treatment and veterinary public health policy in colonial India. The great Zoonotic waves of rabies that caused serious concern for public health in colonial India are also discussed in this paper.

1.3 Methodology

This study has followed the historical and empirical method. Historical Empiricism is the most common method used in the research of modern history. It involves collection of contemporary documents from the State Archives, either National or Regional or provincial followed by their evaluation with the method of internal and external criticism. Data for the present work has been collected from the primary and secondary sources. Archive has been used as primary source of data. Books, articles, newspapers, vernacular books and literature, unpublished materials, electronic resource etc constituted secondary data for the present study. Data collected from various sources have been analyzed systematically. Qualitative information have been analysed on the basis of systematic and analytical description. Numerical data have been presented with the help of Tables.

1.4 Significance of the study

Though few studies have been conducted on the impact of Rabies in Colonial India, the present paper is an attempt to study the issue in holistic perspective. Thus, in the present paper besides investigating the impact of rabies in colonial India, the treatment of this disease and veterinary public health in Colonial India will also be studied. This will enable us to understand the issue in a clear manner. Besides, the study will help to create general awareness among the common masses about the impact of rabies, Zoonotic diseases and its treatment.

2. BIRTH OF THE PASTEUR INSTITUTION

Louis Pasteur was one of the greatest scientists of the nineteenth century who founded the science of microbiology, began to work on a cure for rabies. He discovered that the virus of rabies is localised in the central nervous system brain and spinal cord. After the bite of a rabid animal, the virus enters the peripheral nervous system. As the virus is neurotropic, it travels quickly along the neural pathways into the central nervous system and then to other organs. The salivary glands receive high concentration of the virus, thus allowing further transmission [9]. He also discovered a vaccine for rabies and a movement began to collect funds for an institute that would honour him and carry on his scientific work. People from all over the world, including the Tsar of Russia and the Emperor of Brazil sent in contributions. The Pasteur Institute at Paris (France) was started in 1888 and Pasteur became its director. In 1895, Louis Pasteur died and was buried in the same institute [10].

Louis Pasteur obtained his first success against rabies through vaccination in 1885. At that time, Dr. Lingard, Bacteriologist, had proposed to introduce a system of anti-rabies vaccination in the Bacteriological laboratory at Poona. A similar proposal was also submitted by J.H.B. Hallen, a civil Surgeon in 1890 [11]. In 1891, under the supervision of Dr E.H. Hankin, a small bacteriological laboratory was set-up at Agra to cater to the needs of practically the whole of North India [12]. On April 22, 1893, a meeting of some prominent citizens at Lahore passed a resolution to set-up a Pasteur Institute in the Punjab. In December 1894, the Indian Medical Congress at Calcutta accepted this resolution. Consequently, the Government of India approved the proposal to establish Pasteur Institution in different places in India. Later, five institutes were established at Kasauli (1900), Coonoor (1907), Rangoon (1916), Shillong (1917) and Calcutta (1924) for anti-rabies treatment. Gradually rabies patients were treated at pasture institute [13].

Thereafter, Kasauli, an area in the Himalayas situated at 5000 feet above sea-level, was selected because of its salubrious climate for setting up this institute. In 1900, the Pasteur Institute of India at Kasauli was founded under the charge of David Semple (an officer of the Indian Medical Service, IMS). The institute was not a government institution. It was administered by Pasteur Institute Association and was supported by Governments grants and voluntary contributions. During the first year of its establishments the institute treated three hundred and twenty one patients of rabies. For the next seven years, the Pasteur Institute, Kasauli was the sole institution of its kind and it drew patients from all parts of the Indian sub-continent especially from the Punjab, United Provinces and other parts of North-Western India including Afghanistan and the North-West trans-frontier country [14]. With the increasing demand for anti-rabic treatment, other Pasteur Institutes were set-up at Coonoor, Rangoon and Shilong, and departments at the Haffkine Institute, Bombay, the School of Tropical Medicine and Hygiene, Calcutta, and Prince of Wales Medical College, Patna were maintained for the manufacture and use of anti-rabic vaccine [15].

Kasauli being situated in lower Himalayas, Government provided concession rate of railway fair to travel to pasture Institute for treatment. An indigent person not in the public service (together with one attendant when such indigent person was a women or a child under 16 years of age or a man who, by reason of age or other sufficient cause, is incapable of travelling alone) would be given third class ticket free of charges [4].

Any government servant whose pay not more than Rs.500 per month was granted one month casual leave along with a month of pay in advance. On the other hand, free travelling expenses to Kasauli, casual leave for one month along with a month's pay in advance was granted to a government servant whose pay was less than hundred rupees per month [16]. The Pasteur Institute of Southern India was opened in 1907 at Coonoor, Nilgiris. The major portion of the necessary funds was provided through the munificence of Henry Phipps, an American philanthropist [15]. The Pasteur institute of Burma at Rangoon was started in 1915 [12]. The proposal to establish a Pasteur Institute in Assam was first put forward in 1906 by the Assam branch of the Indian Tea Association. Finally the buildings were completed and the institute was opened as an anti-rabic treatment centre in 1917 [17].

In 1933, some out-centres for treating anti-rabic cases of northern and central India were opened at military centres like Allahabad, Bannu, Bareilly, Dhera Dun, Fort Sandeman, Jhansi, Karachi B.M.H., Karachi I.M.H., Lansdowne, Lucknow, Meerut, Mhow, Murree, Peshawar, Quetta B.M.H., Quetta I.M.H., Rawalpindi, Ranikhet, Razmak, and at civil centers like Abu Road (Sirohi State), Agra, Ajmer, Allahabad, Bhawalpur, Benares, Bikaner, Chamba, Dheradun, Delhi, Gwalior, Jammu, Jind, Jodhpur, Kota, Kapurthala, Lahore, Lucknow, Mussorie, Nanital, Rampur, Srinagar, Udaipur. This process of decentralisation of anti-rabic treatment proceeded rapidly. By 1938, about 200 out-centres were getting supply of anti-rabic vaccine from Kasauli alone. The Pasteur Institute of Southern India, Coonoor had also decentralised anti-rabic treatment to a very large extent. The treatment was available at all Government Headquarter hospitals, in selected hospitals of Native States, Railways, Mission Hospitals, Cantonments, District and Central Jails. About 115 out-centres were authorised to provide anti-rabic treatment in Southern India.

The King Edward VII Memorial Pasteur Research Institute, Shillong provided antirabic vaccine to 15 public centres and 33 private centres. Haffkine Institute, Parel, Bombay started its out-centres at 44 places [15].

3. RABIES MORTALITY

The report of Pasteur Institute shows that 17000 human beings were treated at Kasauli within 1902 to 1912, and the animals which bit humans were as follows:

Table 1. Biting animals (1902-1912)

Animals	Number of human	Percent
Dogs	14730	84
Jackals	2491	14
Horses, mules, etc.	140	0.80
Cats	78	0.44
Cows and buffaloes	16	0.09
Total	17455	

Source: National Archives of India (1915, June). Foreign and Political Department, Proceeding No.186-187

Above table indicate that from 1902 to 1912, 17455 people bitten by animals. Among them human were affected by dogs bit i.e. 84 percent. Table 2 shows the cases treated, death and percentages of mortality by rabies diseases.

Table 2. Number of rabies patients treated

Year	Cases treated	Deaths	Mortality (%)
1886	2682	36	1.34
1887	1778	21	1.18
1888	1625	12	0.73
1889	1134	10	0.88
1924	1461	17	1.16
1925	4168	33	0.79
1926	5141	43	0.84
1927	6475	61	0.94
1928	7529	54	0.72
1929	8099	50	0.62
1930	6958	42	0.61
1931	7761	43	0.55

Source: Year 1886-1889: National Archives of India, October 1892, Revenue and Agriculture Department, file-41, Proceedings 1-2, Year 1924-1931: Nicholas, M.J.. Report of the superintendent, Pasteur Institute, Annual report of the Calcutta school of tropical medicine Carmichael hospital tropical diseases 1932, Bengal Government Press, 1933, p.149

The above table depicts that 7219 persons were treated at the Pasteur institute during the year of 1886-1889. Out of which 79 (1.09%) person were died. Since 1924 rabies patients were treated at the pasture Institute in Calcutta and given anti rabies vaccination. It was also observed that in the year 1927, the mortality rate was higher than the other years. But the mortality rate was decreasing gradually after 1927.

Table 3 shows the mortality from the rabies in the various provinces in British India in the year 1926. It was observed that the mortality rate was high in Madras Presidency followed by United Provinces and Bengal Presidency. However, it was also observed that the death rate was high in rural areas in comparison to the urban areas.

Table 3. Rabies mortality in British India

Provinces	Death from Rabies		
	In rural area	In urban area	Total
Delhi	NA	NA	NA
Bengal Presidency	284	65	349
Bihar and Orissa	182	21	203
Assam	51	4	55
United Provinces	349	46	395
Punjab	138	34	172
North-west Frontier Province	1	NA	1
Central Province	159	36	195
Madras Presidency	388	100	488
Bombay Presidency	189	45	234
Burma	154	32	186
Total (British India)	1895	383	2276

Source: *Annual report of the public health commissioner with the government of India for 1926*, Government of India, Central Publication Branch, p.61, 1928

It is a fact that Bengal province was very affected zone. Many people suffered from rabies. According to the *Annual Report of the Public Health Commissioner (1926)*, in Bengal Presidency, 349 persons died of rabies. Out of that 65 died in town areas and 284 in rural areas. The deaths were more in rural areas due to non-available of western veterinary medical facilities and medicine. Among them 36 persons died in Calcutta and 3 persons died in the Nadia district [18].

Furthermore, in the year 1932, 7250 persons were treated in the Pasteur Institute of Calcutta (1924) and most of the patients were residents in Bengal province. From various other parts of India, few patients came to Pasteur Institute of Calcutta [19].

4. TREATMENT AND VACCINATION

The control of rabies in India constitutes one of the most difficult problems confronting both medical and veterinary authorities. Kasauli and Coonoor both the institutes were non-residential hospitals. For, hotels, Dak Banglows, Boarding houses were set up for both Natives as well as the Europeans. The colonial government also granted concessions for the poor patients [16]. The British soldiers and officials were treated specially. The Colonial authority in India ordered all the remount depots (except that at Ahmednagar) to grant concessions and permission to the depot servants and other persons to go to a Pasteur institute for taking anti-rabies vaccination (or treatment) [20]. An association named 'the Northern India Kennel Association' had been formed for the prevention of rabies in India whose main function was to look after the dogs generally. It took several significant measures for that purpose like, levied small taxed on dogs, taxed dogs had been distinguished by small metal discs or tabs attached to their collars, to arrange for the destruction of all ownerless dogs, raids on jackals by employing men to snare or shoot, legislation in cantonments and municipalities all over the country, the established of homes and lethal chambers, muzzling where rabies had assumed a very aggravated form, and free circulation of leaflets as well as pamphlets about the symptoms and treatment of rabies as propaganda work [21].

In both Kasauli and Coonoor institutes, the treatment of hydrophobia was carried on by using pasteurian treatment procedure [4]. Sir David Sempee, the first director of Pasteur institute of Kasauli launched the curative method of rabies treatment [22]. A continuous stream of good research work has emanated from this Institute. When this Institute was first opened Pasteur's Dried Cord method was used, then followed the dilution method of Hdgyes and since 1911 the carbonized method of Sample has been used in this and other Pasteur Institutes of India [13].

Cornwall, Pai, La Frenais and others doctor carried on research work on rabies. The Pasteur Institute of Burma was next instituted and latter others came up, in Assam, in Bombay and in Calcutta. The principle has been adopted was of manufacturing the vaccine at a given centre and sending it out widely to smaller centers. Thus the vaccine was brought to the people and the delay and anxiety incidental to long train journeys was a thing of the past [13]. H.E. Shortt, Director, Pasteur Institute of India, Kasauli further discovered in 1933 that in the brain, especially in a region called the Hippocampus major, certain bodies

called “Negri bodies” existed in the large pyramidal cells which form a distinct zone or band in the tissue. Existence of such “Negri bodies” was 100% diagnostic for rabies infection [15]. The buildings were completed and the institute was opened as an anti-rabic treatment centre in 1917 [17].

In addition to these, many district headquarters were supplied with vaccine by these Institutes where treatments were carried out. The bitten animals were also treated with vaccine from the nearest available centre [13]. However, as the best way of rabies prevention it was proposed to avoid rabies exposure, decrease of stray dog’s population as well as segregation of dogs with rabies [1].

5. CONCLUSION AND RECOMMENDATIONS

From the above discussion it is evident that rabies was one of the most dangerous animal diseases that affected the human life in colonial India. It was a devastating disease in Colonial India. A few British officials and soldiers were bitten up by dogs during the colonial period. With the attempts of the British officials clinics to deal with such disease were opened. The British offers various attempts to cure the disease of rabies among the human. With the establishment of Pasture Research Institute they were successful to cure diseases of rabies among the human.

Awareness should be created among the people on the mode of transmission, prevention and control of rabies. In spite of the availability of scientific methods to control rabies in dogs the effective implementation of such rabies control programmes and technologies are dependent on political will, community commitment and sufficient financial resources at the global, regional, national and local levels.

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