Social History of Medicine in Colonial India

John Bosco Lourdusamy

Dept of Humanities and Social Sciences

IIT Madras

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Lecture 02

Kala-Azar as Exemplar of Tropical Disease

Hello and welcome to yet another lecture, Lecture number 22. We have been talking a lot about epidemics and particularly we have been talking about tropical diseases. Today what we will do is, to take a very particular tropical disease – Kala-azar - and see it as an exemplar of all that goes with tropical disease, understanding the accompanying culture and all that. Because we have been saying that malaria was the most projected tropical disease. We have been talking about malaria quite some time and we will be talking again also. I thought now we will take this particular disease. Once it was established as a field (about which we were discussing in an earlier lecture), tropical medicine provided a way for lot of facilities and programmess to study diseases and their origins and causes through the lens of parasitology - primarily though not exclusively - and which meant that they also spent particular time and attention towards understanding the possible vectors because these parasites were carried by particular vectors. For instance, the malaria parasite - as we saw - was carried through female Anopheles mosquito which was discovered by Ross.

Scientists were looking at those kinds of presence of particular kinds of flies as potential vectors for diseases in those particular regions they were studying. All of this was very useful in identifying the nature and the causes of many diseases which earlier were clubbed together as fevers - everything was fever. Fever was just what we now understand as a fever is a particular condition with rise in temperature and all that. So many things were called as fevers or some were understood as variants of some other known disease. For instance, Kala-azar itself, as we will see, was for long - even by reputed people - wrongly assumed to be malaria, one form of malaria. In many ways Kala-azar is an exemplary case – it had parasite - a clear parasite which was identified, then they identified a carrier and more importantly the particular kinds of socio-economic conditions which facilitated and engendered the particular disease. As I have been

saying, tropical medicine is not just about the tropics as a physical thing or just about medication and the parasites and all those things. There was a whole lot of other things that went with it - the culture of tropical medicine - not only the surveys and the researches, but also the commercial angles sometimes which prompts the kind of interest in particular kinds of diseases and as usual, the failure of the government to address them adequately - either medically through therapeutic methods or the more underlying socio-economic factors behind the disease. All of that we will see unfolding in the case of Kala-azar.

A few details about the disease as such… As we said, each of these diseases was identified to be caused by a particular organism - a protozoa in this case - called Leishman-Donovan body and the carrier in this case, is sandfly which carries the parasite from the blood of infected person to another person basically through its bite - like mosquito. Once the parasite is in to the body, it causes a kind of sores on the skin and ulcers at the very site of the biting. Eventually the parasites spread through the body and attack the immune system itself if not checked in time. The sickness is basically caused by the movement of the parasites to the internal organs such as the liver, spleen and bone marrow. The symptoms of the disease are fever, weight loss, fatigue, anemia and substantial swelling of the liver and spleen inside. All of this means that if not checked and treated in time, this can lead to death, it could be very fatal. And this particular disease occurred both epidemically as well as endemically in India during the colonial period that we are studying. And in India, it was particularly prevalent in large parts of eastern India with Assam, Bengal and Bihar being affected the worst. In fact they were in epidemic forms in these three regions occurring at intervals of about 15 to 20 years and each time it came, it lasted about 3 to 4 years - causing very high number of deaths and very serious loss of population in these areas. As one writer said in Assam, this disease made many areas into veritable valleys of death.

As I said in the beginning, this was one of those diseases which was misunderstood because the causes were not properly known and therefore it was often misdiagnosed as a form of malaria till about 1903. And as we saw, Kala-azar was a serious problem in Assam and we are mentioning this again here because Assam, as we all know, was very significant from a commercial point of view especially with regard to the huge number of tea plantations. And again as we know, tea plantations have large labour force staying within that given area which has lots of implications on the one hand, diseases can easily spread. On the other hand , you can also study the diseases in a controlled atmosphere and it is also easier for vaccination and all that. But all said and done, any danger of disease in enterprises like tea plantations have a lot of commercial consequences apart from the health dimensions as such. And since it has commercial consequences, you could expect the medical relief measures that were organised - but due to the inappropriate and inadequate understanding of the disease, these measures were not very

effective and again given the commercial considerations, there was special interest and government initiated scientific investigations into the disease from the 1880s and many IMS offices were involved in this. But most of them still saw Kala-azar as something as some kind of a variant of malaria.

One of the important names in this regard - and not only in this regard but in the entire history of medicine in colonial India - is Sir Leonard Rogers, a name which you can never ignore when you are studying about history of medicine in the colonial context. In this context, Rogers along with Ronald Ross opined that Kala-azar was a virulent form of malaria, basically a variant of malaria though neither of them found the actual malarial parasite in the Kala-azar patients. (As you know Ronald Ross found out the vector but in that context I told you someone else called Alphonse Lavaran found out the actual plasmodium, the parasite which causes malaria). Both of them (Rogers and Ross) were aware though they could not find that particular parasite – but they still felt that this was a virulent form of malaria. Since I have introduced the name Rogers, it is the right time to say a little bit more about him. As I said, he is one of those towering figures and especially in the saga of tropical medicine in India. He was an IMS officer and he was related to a lot of things related to tropical medicine in particular: he was a key player in the setting up of the Calcutta School of Tropical Medicine in Calcutta. He was also a founder member of the Royal Society of Tropical Medicine and Hygiene and he also served as its President from 1933 to 1935. In 1900, he was appointed as a professor of Pathology in Calcutta and he contributed in a very special way to identifying cures for cholera and leprosy. He also had interest in snakes and snake venoms. He had a special gift for field work and research which the colonial state was sort of deploying in a very fruitful way - especially in the case of Kala-azar. He was appointed to this very place - which was you know, one of the hot spots of Kala-azar - that is Assam. You would also guess why he was sent to Assam - the team plantation connection. He again, was not able to differentiate Kala-azar from malaria with whatever facilities were at his disposal. But one thing he was sure - that the disease had a specific connection to particular places. Based on that, he could at least propose an effective method of prevention, which was a very logical one – it was basically to shift the people - affected people of a particular village - to newer sites, because it was very clear that the disease had something to do with the place, there was something in the place was the cause. So, until that something was found out, certainly what could be done was to move the affected people away from there. We will also come back to Rogers later on - once the actual causes, the parasite, the vector and all that had been discovered, he would propose a chemical medication, we will come to that later.

In the meantime there was a very major breakthrough in Kala-azar research and that happened in this part of the country, Madras. And another big name that pops up here is that of Charles Donovan. He again was an IMS officer. He served in the Madras

presidency and in Madras itself in from 1898 to 1919. In fact he was at the Madras Medical College and the hospital attached to it as a surgeon as well as a professor of physiology and later, the rest of his time in Madras was spent as Superintendent at the Royapettah hospital, which is in another part of Madras. Even before he came to Madras, Kala-azar had been there at least 30 years. But the government did not show much interest because it was not as widely prevalent as elsewhere and also because it did not have much impact on the tea industry in Madras presidency. Madras Presidency also had tea growing areas, one is the Nilgiris – Ooty, Coonoor, Wayanad and other such places, and also neighbouring places in the princely state of Travancore - Munnar and other such areas. The implication here from this sentence is that, here also the concern about tea and labourers in tea plantations had something to do with it. Once there was interest in it, he was one of those people who worked in this area and during the course of his research, he identified traces of a parasite. He sent that on slides to Ronald Ross. Ronald Ross was at that time in Liverpool. Both Ronald Ross and Donovan concurred that the parasite which he found was actually the causative agent of Kala-azar. In the meantime, the same kind of discovery was done in England itself by William Leishman and therefore the parasite was named after both of them, as the Leishman-Donovan body which I mentioned earlier in the beginning or in short abbreviated form as the LD body and the disease itself was called as Leishmania donovani. And after this, many members of the IMS and subordinate medical service continued to pursue research on Kala-azar for over 50 years and they contributed to a thorough understanding of the disease and the government again appointed a special Kala-azar Commission in 1924 to study the disease. Now a Commission, a group as such studied - till then individual workers individually did the research and made findings. Now as a group, as a Commission, they worked for almost like 6 years and expectedly they produced information on every possible aspect of the disease. Another name pops up now - this with regard to identifying the vectors. As I said in the beginning, in most of these cases, there is a protozoa, the germ, the disease-causing organism and then there is the vector which carries it. Here the important name in this regard was Colonel Frederick Percival Mackie, who again was an English physician who was with the IMS from 1901 to 1931. He worked on incidence, transmission and pathology of insect-bornE tropical diseases generally and in 1909, he was appointed as the special research officer by the Government of India for investigation of Kala-azar.

You see already the kind of attention that Kala-azar was inviting - in terms of research officer, commission and other such manifest interests. He again went to the heart of disease - the main place where it was occurring - to Assam and in particular the Nagang district in Assam. He saw that Anopheles mosquitoes which cause malaria were rare, which means it was not some kind of malaria. But on the other hand, sandflies were more common in the affected areas. He captured those insects on fly papers and examined them for signs and the stages of the parasite's growth in them. He also made the

connection between the distribution of the disease and the sandflies - wherever the sandflies were found in large number, there also the disease was more prevalent. This gave a clear indication that sandflies were the vector. When they bite a particular person who is infected, they suck the parasite from that person - in fact they suck the blood which has the parasite, in that person - and then they go and bite another person. It gets injected (almost the same way as Anopheles does with regard to the malaria parasite).

There were also others in India who were studying the disease in other parts of India. They also arrived at a similar kind of conclusion. But Mackie has been given priority for the discovery and these kinds of discoveries - now both the parasite has been identified and the precise vector has been identified, and already India's reputation was on the ascendant with regard to tropical research - and this work on Kala-azar added to India's preeminence in Kala-azar research in particular, and tropical research in general. But. as we have been saying from time to time, doing research, cutting edge research and finding out the vectors of the parasites is one thing. But what happens on the ground, that is a different thing. The government failed to provide adequate treatment to the people. Little effort was made from the state side to control - even after the understanding of the important aspects of the disease and also when means were available. At least earlier, one could blame to some extent, the lack of understanding - the disease was so confusing and there were not too many means for dealing with it. But now everything was there, what was missing was as usual, the lack of will.

The disease continued to persist in many parts of the east and northeast of India and in fact it was increasing towards the end of British rule and mortality rates also continued to rise. And as usual, by now you would have guessed, what would be one of the primary reasons for the government's inadequate measures - as usual, the top candidate is unwillingness to spend, lack of finances and more importantly this is even more costly. The government was not willing to address the underlying socio-economic factors. The parasite and the vector is one side of the story but how they thrive and survive is because of the other kind of circumstances which allow. As usual this is something we have to bear in mind when we are talking about disease and healthcare. A whole lot of things which are not very directly related to medicine also have to be studied and tackled - in this case, factors like malnutrition, movement of population through migration, and poor working and housing conditions, all of which provide the kinds of conducive conditions for this and many other diseases to start and spread.

But also, with regard to the curative aspects - leaving alone the preventive aspects or the socio-economic aspects - coming to the curative aspects, drugs like quinine and thymol were not that successful. Now Leonard Rogers comes again, he proposed antimony-based medicine in 1915. This was based on a particular kind of understanding he had - he had known that salts of antimony had been used in the case of African trypanosomiasis disease and he felt that the parasite in that case was similar to the parasite here in

Kala-azar and therefore similar kind of antimony-based treatment would work. But the problem was that it had serious side effects, toxic effects and other kinds of disadvantages. Another kind of a compound called sodium antimony tartrate - medicine made of it - was a little better tolerated. Here again the treatment was very difficult to enforce or as you know like some of these kinds of treatments involve people very seriously, following the entire course of the treatment. If it is left half way then it can have even more dangerous effects. It was very difficult to enforce that kind of compliance with the full course of treatment. From the infected people's side also, it was not just because they were irresponsible or lazy or did not care about the health, but it was also because of the side effects, the tediousness - it was a difficult medication.

And finally, we have come across many names and we have come across Indian names - in fact throughout this course we hardly came across any big Indian name. Kala-azar is unique in that sense - there was an Indian also who played a big part, this is Upendranath Brahmachari. He was a very successful medical practitioner in Bengal, and he was also a professor, a teacher. He had a MD degree and also a PhD degree from the Calcutta University and he worked at the Camfill Medical School - it is there even today in what is now called as Kolkata - now it is called as Nil Ratan Sarkar Medical College, at that time Campbell Medical School in Calcutta. While he was there, he carried out many works related to Kala-azar between the years 1915 and 21. In he course of that, he synthesised a particular antimonial compound called urea stibamine in early 1921. This was more efficacious than all the other ones - we mentioned the other ones which had been tried. This was less tedious - it was able to effect, complete cure in much shorter time. It was used on an experimental basis. Most of these new remedies which come, used to be tried on a small set of people and that is why these special enclaves like prisons and tea plantations are very useful - for those kinds of trials. Similarly in some they were tried initially from 1923 and after about 5 years, based on the very positive results of the trials, it could be again tried on a mass-scale from 1928 onwards. It was found to be very effective even in resistant cases where Kala-azar was non responsive to other drugs. The combined effect of all this, is that it brought down mortality drastically, which means that wherever it was tried, it had the effect of bringing down the death rate - fatality was low. It does not mean that the disease itself ended or mortality stopped. It proved that at least in the cases where they were tried, mortality can be drastically brought down. As we said, with regard to the disease as such, one more new knowledge has been added - earlier we said that there was a better understanding of the protozoa, the carrier and ways of even handling the carrier. Now in terms of a preventive method, there is also a solid curative, easily manageable, curative method. But, in spite of that, the disease itself did not disappear too soon. As we know, that requires a lot of other things, not just the knowledge of it, which we will be seeing again and again and which is something of a lesson that is of great relevance even for today. On that note, we will close this lecture today. Thank you.