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COMMENT

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Skin diseases among the tribal population of Kerala: the challenges and way forward

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Abstract

Background Kerala has a history of achievements in health through acting on the distal social determinants, but certain communities like tribals were pushed back from the stream of social development and health achievements. Subsequently, the lifestyle and the poor living conditions of tribes make them more prone to several diseases including skin diseases. However, neither the burden nor the situation of the same in the tribal population in several parts including Kerala is seldom assessed.

Main body The lack of awareness about the symptoms, complications, and management options as a part of the social backwardness has led to the concentration of certain diseases like Leprosy among the tribal community. In addition, the tribal population is under the threat of infectious diseases of public health significance like Leishmaniasis (CL). The tribal population owing to ignorance neglects the skin lesions or uses their local remedies. Tribes might have been using many local remedies for their issues, but the emerging skin diseases may not be amenable to local remedies and often impose significant public health concerns. Developing and maintaining an effectively functioning health system in these difficult-to-reach terrains is also a challenge. The pattern of skin diseases among tribals residing in environmentally sensitive localities is an indicator for the need for more social, economic and geospatial inclusion. Skin lesions of the tribal population should be kept under active surveillance activities through the integrated health information platform (IHIP) and it should follow a vigilant public health response if there are clusterings. A dedicated evidence-based system should be developed to diagnose and treat skin diseases of tribal people residing away from the availability of specialist care using local resources and community-level workers.

Conclusion The rampant skin diseases among tribals are the product of their unacceptable socio-economic status and living conditions. It could only improve through interventions focusing on social determinants of health. Improvements in the living conditions of tribals are sustainable long-term solutions, but such solutions should be coupled with medium-term and short-term strategies.

Keywords Skin diseases, Tribal Population, Kerala, Public health

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Background

The differences in the colour of human skin are skin-deep but are one of the reasons for discrimination over centuries. The colour of the skin may be the most used indicator to demarcate ethnicity and race [1]. It is a paradox that people or communities with deviant skin colour and texture are not exempted from discrimination, even if their society at large suffers from a similar kind of apartheid from their sister societies [2]. Indigenous communities suffer such marginalisation not only in skin colour but also in terms of caste, creed and lifestyle. It occurs in various degrees in all societies [3]. The Tribal of Kerala (India) is such a community that failed to cope with the social development of the State. Most tribes live in forest areas or forest fringe away from basic amenities. Accessibility to services was limited by their ignorance and lack of confidence accumulated over the years [4]. Physical features could also have contributed to the discrimination. Tribes in Kerala have darker complexion and shorter stature than the general population [5]. It is not surprising that pathological deviations of skin colour are more a reason for stigma in societies which fail to appreciate physiological differences in the colour of human skin. Skin diseases were considered a curse by gods and people suffering from them were labelled as sinners. Leprosy, the systemic disease with predominant skin manifestation is one of the diseases with a huge stigma surrounding it and has been the nightmare of people for centuries [6].

In this commentary, we analyse infectious skin diseases prevalent among the tribal communities of Kerala as an outcome of inequity rather than the cause. Most of these diseases present with skin manifestations which may be seldom cared for by the local community because of the stigma and discrimination attached to it. Some of these diseases are very mild to start with and neglected by the person suffering from them because of the lack of awareness of the tribal community about the consequences of the infection. Another major issue is that the health system and its appendages are weak in the difficult-to-reach areas of the tribal belt and the surveillance mechanisms to detect and manage such infections are poor. This commentary appraises the published literature on infectious diseases with skin manifestations affecting the Tribal population, particularly those in Kerala. We also examine the public health concerns of such infections present in the outreach segment of the community.

Why are tribes more prone to skin diseases?

The lifestyle and living conditions of tribes make them more prone to skin diseases. The inhabitant areas have hot and humid climates and high rainfall [7]. The area they reside possesses a high risk for insect bites which can lead to a multitude of diseases from insect-bite reactions of the skin to highly contagious infectious

diseases transmitted by insects [8]. It could be noted that the hilly terrains of Kerala were very vulnerable to mosquito-borne diseases like Malaria, Dengue and Chikungunya. [9–12]. However, the burden of the same in the tribal population of Kerala is seldom assessed. Along with those from mosquitoes, tribes are more vulnerable to many emerging diseases caused by ticks like Lyme's disease [13] and Kananur forest disease (KFD) [14]. The rashes and other dermatological manifestations resulting from insect bites and hemorrhagic fevers may not be visible in people with dark skin. The emergence of cutaneous and visceral forms of Leishmaniasis in the tribal community of the State is a grave threat to public health for the entire state and perhaps for sister communities as well [15]. The hot and humid climate makes them more prone to fungal infections and parasitic infestations like scabies which are very contagious and likely to affect people with close social interaction in groups like tribes. Another issue is that infectious diseases with enormous public health importance will not be under the radar of routine surveillance when they appear among tribes. Even the person affected by the disease and family members are likely to neglect the disease if the manifestation is on the skin. There is always a notion that lesions affecting the skin are less important and one can wait and often the affected person attributes the same to some injuries or trauma. So, skin diseases affecting tribal people are of utmost importance. They are more prone to certain skin diseases, which can add to discrimination, it may add to stigma, and may seldom be diagnosed and managed, often they may have epidemic potential because it is less likely to be controlled in small numbers. These problems are likely to be increased in future because of climate change and related issues.

Leprosy

India is the home of more leprosy patients than anywhere in the world [16]. However, the incidence came down drastically over the years mainly because of active case findings and the administration of multi-drug combinations in masses [17, 18]. Naturally, the surveillance, diagnosis, and treatment might be less intensive in communities because of their less accessibility to availing the services. Leprosy is a disease related to social development and the burden of such disease might have been more at the outset itself among tribal, who are socio-economically backward [19, 20]. Their lack of awareness about the symptoms, complications, and management options is also part of the social backwardness. There is ample evidence that leprosy in India is highly concentrated among tribal and there is the minimum concentration of attention on this risky group [19, 20]. Kerala is one of the States in India that recorded the lowest rates of prevalence of Leprosy, and it is not considered a priority.

However, it is more likely that the disease might have concentrated on disadvantaged populations like migrant labourers and tribal [21]. The disease has always been a public health concern and more so now because of the threat of anti-microbial resistance (AMR) [22, 23]. Non-compliance to treatment and lack of regular follow-up are factors that contribute to drug resistance to Leprosy [24]. Tribal populations residing in difficult-reach terrain may be more exposed to such risk factors. Leprosy has been a concern for Tribal communities in India for centuries. But we don't have sufficient data to assert any increased incidence of the disease among the Tribal of Kerala. We must keep it on the radar because of the vulnerability of Tribal to Leprosy, lack of awareness, less likelihood of case detection among these groups and the possible resurgence of infection because of AMR.

Leishmaniasis, Lyme's disease and Kananur Forest Disease (KFD): the emerging public health threats

It is critical to note that the tribal population of Kerala is under the threat of infectious diseases with huge public health significance. Cutaneous leishmaniasis (CL) is a skin disease rampantly present among tribals living in the foothills of the Western ghats, a dermatological variant of a highly infectious systemic disease, Kala-azar [15, 25]. Similarly, KFD is a hemorrhagic fever caused by a virus categorized to the most dangerous category, the category four bio-safety level, reported among tribals of Wayanad and Malappuram districts from 2015 onwards [14, 26]. Lyme disease (LD) is another emerging zoonotic infection reported repeatedly from the Tribal population of Wayanad which is transmitted by ectoparasites living in rodents and deer [27]. These diseases are largely related to the habitat and livelihood of the community. Living in forest fringes increases the likelihood of such diseases.

Among the emerging infections listed above, all are now largely limited to the Tribal population of Kerala, and CL and LD has predominant skin manifestations. Leishmaniasis is transmitted by an insect known as a sandfly and Western Ghats is the house of many species of sandflies [28]. New species of sandflies are being identified from CL affected Tribal belt of Kerala [28]. Along with the hot and humid climate, the housing pattern of tribal people increases the risk of the infestation of sandflies [4]. Sandflies lay their eggs in the cracks and crevasses of their house. Low economic status and inadequate government support make the tribal families live in mud houses or brick houses without plastering. This ends up in a heavy infestation of sandflies at their houses and makes them more susceptible to diseases caused by insect bites. There is evidence that the community dogs universally present in tribal hamlets can act as the reservoir for this disease [29]. Dogs are an integral part of the life of Tribal because of the presence of wild animals at

their premises; dogs offer protection along with companionship. But this very relationship can make them more at risk of zoonotic infections. Cutaneous leishmaniasis is presented as skin lesions, often neglected by the infected person, or she may attribute it to a nail prick or a trauma [30]. But there is evidence that the same agent and vector transmitting cutaneous leishmaniasis among our tribal population is responsible for a serious systemic infection known as Kala-azar elsewhere.

It could be noted that the Tribal in Kerala are more prone to emerging infections because they are more exposed to insect bites. In the case of CL, the insects transmitting the infection emerged from their poor dwelling places themselves. The proximity to wild animals like monkeys and deer is making them more prone to infections like KFD and LD. The most common presentation of LD is also a skin lesion occurred because of the bite by an infected tick. It will be difficult to identify the skin lesion in a dark-skinned tribal person if the lesion is mild. But the infection can result in severe neurological disease in rare instances. Tribals are prone to many other diseases transmitted by insects like scrub typhus because of their risk of insect bites [31]. The pathognomonic feature of scrub typhus is a skin lesion known as eschar at the site of an insect bite which resembles a burn or an ulcer. Activities related to shrubs and forests are identified as risk factors for this disease. This disease, while it started reported by Government Medical College, Kozhikode, and the victims, were the tribals of Wayanad district. So many diseases of tremendous global public health importance could be transmitted by insects like ticks, like Crimean Congo Hemorrhagic fever.

Issues in the management of skin diseases

Issues in the management of skin diseases are multifocal and multifaceted. Tribes had their own indigenous folk medicines which might have been effective against many of the problems even if those remedies are never scientifically validated [32]. Tribal medicine was proved to be an excellent source of active ingredients that can address many health problems that modern humanity suffers. Artemisinin, the cure for falciparum malaria has been derived from Chinese herbal medicine [33]. That level of research activities was never attempted in our tribal medicine even if herbs like 'arogya pacha' are celebrated as a cure for many health problems [34]. Regarding the cures of skin diseases, the fruit of the chaulmoogra tree (*Hydnocarpus wightianus*) and chaulmoogra oil was used as a remedy for leprosy by the tribal population of India [35]. Tribals of Agasthyamala forest use leaves of *Wrightia tinctoria* plant leaves for skin diseases which is an ingredient in many Ayurvedic preparations [36]. Tribes may have many emic perceptions of skin diseases and might have been using many local remedies for their issues. But

those remedies are being lost very fast because of non-practicing and the unavailability of raw materials [37]. And the new skin diseases they are facing now may not be amenable to local remedies and they often impose significant public health concerns.

The proper diagnosis, treatment, and containment of these problems are challenged by health system issues. Tribal settlements will be in forest fringes much away from the health facilities. The travel facilities will be very poor, and access is limited by the presence of wild animals and natural geographic obstacles [7]. The representation of tribal people among the health staff will be minimal and the staff may not have a positive attitude towards the lifestyle of the tribals. Some grassroots health workers are functioning in tribal settlements in the State. ASHAs (Accredited Social Health Activists) are selected from the local communities, and they are functioning at the settlements. Apart from the ASHAs, tribal promoters are working in tribal communities. But the knowledge and skills of these field-level workers are inadequate to address the community's current complex issues.

Conclusion

Tribal communities in Kerala are prone to many skin diseases of varying types, injuries, infectious diseases, and chronic diseases, because of their living conditions and socio-economic situations. Foci of infectious diseases with public health connotations, starting from leprosy to leishmaniasis, put the tribals at risk and the general population at risk. At the same time, the efficiency of the health system is very poor in its functioning among the tribes. One possible option is to improve the knowledge and skill of the health personnel working among tribals.

The rampant skin diseases among tribals are the product of their unacceptable socio-economic status and living conditions. It could only improve through interventions focusing on social determinants of health. Kerala has a rich tradition and history to make achievements in health through acting on the distal social determinants, but certain communities like tribals were pushed back from the stream of social development and health achievements. Improvements in the living conditions of tribals are sustainable long-term solutions, but such solutions should be coupled with medium-term and short-term strategies. The establishment of health facilities with speciality services near the tribal settlements is the medium-term solution that we can think of. One of the priority specialities that should be available in such hospitals should be dermatology supported by essential laboratory services. Equipping the available human resource with the basic knowledge and skill to diagnose and treat skin diseases and minor ailment is the short-term strategy that should be implemented. If the field workers could identify the skin manifestation of diseases

with a public health concern, like leprosy and Leishmaniasis with reasonable precision, they can report the same to the surveillance system and facilitate the control measures.

Abbreviations

ASHAs	Accredited Social Health Activists
AMR	Anti-microbial resistance
CL	Cutaneous leishmaniasis
KFD	Kasanur forest disease
LD	Lymes disease

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SMS and RJ conceptualised the idea. SMS and TSA wrote the main manuscript. All authors reviewed the manuscript.

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