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The origin and antiquity of syphilis (treponematosis) in southeast Asia

The plausible reasons for the paucity of skeletal evidence regarding the controversial issue on the origin and antiquity of treponematosis (syphilis) in southeast Asia, suggest a lack of thorough investigation into the skeletal biology of the several remains that were excavated. According to an estimate the skeletal remains of about 69.5 per cent (107) of the prehistoric sites were not reported and even the remaining 30.5 per cent were not thoroughly investigated for paleopathological aspects.

The two recent studies of possible evidence of treponematosis during megalithic (Iron Age) period supports the Old World hypothesis that the disease was prevalent during pre-Columbian period in India.

Key words: old world hypothesis, disproportionate evidence-megalithic (iron age) period - Bhimbetka and Agripalle specimen

Introduction

In a recent review on the origin and antiquity of syphilis (treponematosis), Baker and Armelagos (1988), emphasize that the available evidence (documentary, epidemiological and skeletal) in the Old World is ambiguous, sporadic and equivocal and hence does not favour the pre-Columbian Old World hypothesis as proposed by Hackett (1963); whereas the overwhelming evidence of it in the New World amply supports pre-Columbian American origin (Crosby, 1969). Possibly an enquiry into the plausible reasons for the scarcity of evidence might help in further understanding the origin and antiquity of the disease, particularly in southeast Asia.

One of the arguments for the paucity of evidence is that the pathogen that existed during pre-Columbian Old World was in mild form, not so virulent to manifest to endemic proportions due to prevailing socio-ecological conditions (Hackett, 1963). Though it is difficult to prove unless one can extract pathogens from the paleolithic remains by a suitable technique, but the indirect evidence based on the recent developments in epidemiological and evolutionary adaptation of parasites (especially that these parasites can change rapidly their genetic content or physiological mechanism in response to the changing environmental conditions) strongly supports Hackett's hypothesis (Livingstone, 1991). Hence it was possible that the occurrence of the disease was nonendemic and in mild form during paleolithic period in Old World.

What could be other reasons that might explain the scarcity of Old World skeletal evidence? It might be because the paleopathological investigations carried out were mostly limited to Europe, whereas other regions of Old World were not thoroughly investigated. In fact, the review of literature suggests a lack of proper investigation, and a greater part of Asia and African countries have been hardly searched for. The Old World antiquity of the disease was based on a rather highly disproportionate evidence confined mostly to Europe and to a less extent to southeast Asia (Drusini, 1988 and Brothwell, 1988). This suggests that the research in this area is not yet complete and therefore the available information is not exhaustive enough to conclude on the origin and antiquity of treponematosis. This view is supported by the fact that many new prehistoric sites were now being discovered and with the recent developments in paleopathology in the

Old World, there appears a strong possibility of discovering new evidence/finds, which might reveal more details about the antiquity of the disease.

The paucity of evidence might be also because of problems of identification and diagnosis of treponemal bone lesions from another pathological symptoms and nonpathological causes of exogenous nature and other strong reason could be due to incomplete skeletal finds which often result in ambiguous diagnosis. It could be also due to under-reporting or incomplete studies of several excavated skeletal materials, because either such expertise or interest in paleopathological techniques or investigation were not readily available in the past. In fact, the paleopathological investigations in Asia and African regions of the Old World have begun recently, about two decades ago, and also a majority of the discoveries were initiated by the scientists from western countries.

In continuation with the debate on the controversial issue on the topic, in this paper I would like to bring to notice at least two such recent discoveries in southeast Asia, which reveal the possible presence of treponemal pathogen during paleolithic period in Old World: 1. a recent discovery of a possible case of Yaws and 2. a possible case of syphilitic skull lesions, both from Iron Age period in India.

Southeast Asia

According to Kennedy and Caldwell (1984) there are about 180 prehistoric sites that have been so far discovered but only about 30.5% (63 sites) of them have been so far studied or reported. The spatial and temporal details of these 63 sites are shown in Table 1. These include a collection of more than 1560 skeletal specimens and its part and these have been studied especially for osteometric, craniometric aspects (e.g. Gupta et al., 1970; Deo, 1973; Rao, 1973; Kennedy, 1975; Basu and Pal, 1980; Lukacs, 1982). But the paleopathological aspects of it were available for only a few specific sites that were limited to dental pathology (e.g. Lukacs, 1981, 1984, 1992; Rao and Vasulu, 1985 and etc) and other diseases such as scurvy, hyperostosis, haemolytic anemia etc., (Lukacs et al., 1984; Kennedy 1984,1990a,b). Out of these there was a single case of doubtful cranial Yaws at Inamgaon Chalcolithic site in India (Lukacs and Wallimbe, 1984).

Apart from the above studies, there are about 107 prehistoric sites (42% in India and 46.7% in Afghanistan) which were excavated and are known for the discovery of skeletal finds, but the subsequent investigation on the detailed skeletal biology (including paleopathological investigations) were not readily available and it is quite possible that these were not attempted. These 107 sites, their location and temporal reference in India and other southeast Asian countries are

Table 1 - List of human skeletal remains in southeast Asia

Temporal and Cultural	India		Sri Lanka		Pakistan		Afghanistan		Total	
	A	B	A	B	A	B	A	B	A	B
Pleistocene	8	17	4	4	1	1	1	1	14	23
Holocene	7	81	4	17					11	98
Harappa	2	32			8	336	3	309	13	677
Farming & Herding	11	600							11	600
Megalithic	13	134	1	27					14	161
Total	41	864	9	48	9	337	4	310	63	1559

A: Number of sites.

B: Number of human skeletal remains

detailed in Table 2. Out of 107 sites there were two recent studies which reported the paleopathological aspects and incidently both of them reveal the possible evidence of treponematosi s during Megalithic period (Iron Age), about 2000 B.C., in prehistoric India. They are:

1. A recent discovery of a cranium from Iron Age cave deposit at Bhimbetka (specimen no. 13TF-ICI-F-16) in Madhya Pradesh, the parietal bone showing depressed area with moderate thickening at the border on the ectocranial surface and absence of perforation, which was identified as a possible case of cranial Yaws (Kennedy, 1990a).

2. A reexamination of a cranium from Agripalle (Specimen: Ag-Cist II-2) in Andhra Pradesh has revealed pathological features of an extensive erosion accompanying with intermediate osteitis and ulceration, which all give an appearance of stellate scars, and it was diagnosed as a possible case of syphilis (Rao et al., 1992). Even if the earlier specimen discovered from Inamgaon Chalcolithic period was considered as tenuous (Baker and Armelagos, 1988) and doubtful case of Yaws (Lukacs and Wallimbe, 1984) due to insufficient or partial evidence, but Kennedy's discovery of cranial Yaws from Bhimbetka (Kennedy, 1990a) and Agripalle specimen indicating the possibility of syphilis (Rao et al., 1992), both from megalithic period, cannot be overlooked or ignored. These certainly indicate the possible prevalence of treponemal pathogen and is an additional evidence in favour of pre-Columbian antiquity of the disease in southeast Asian parts of the Old World.

TABLE 2 - List of undescribed human skeletal remains from prehistoric sites in southeast Asia.

Country or Region	Temporal land cultural criteria					Total
	Pleistocene	Halocene	Harappa	Farming/ Herding	Megalithic	
INDIA						
Kerala					1	1
Tamil Nadu					8	8
Andhra Pradesh					7(a)	7
Karnataka	2			1	5	8
Maharashtra			1	2	1	4
Madhya Pradesh	1				1	2
Gujarat		1	1	1		3
Rajasthan			1			1
Uttar Pradesh	1	2				3
Bihar	1			1	1	3
West Bengal				1		1
Punjab			3			3
Kashmir			1			1
Total	5	3	7	6	24	45
OTHER COUNTRIES						
Sri Lanka	1	2			6	9
Pakistan				1	2	3
Afghanistan			16	32	2	3
Total	1	2	16	33	10	62
TOTAL	6	5	23	39	34	107

(a: two sites have been recently reported (Kennedy K.A.R. 1990 and Rao et al., 1992)

The two skeletal evidences of treponematosi s at two locations during megalithic period in two states (Madhya Pradesh and Andhra Pradesh) in India strongly suggest the possibility of its wide prevalence. According to a survey by Steinbach (1976) a rough estimate of the prevalence rate of treponematosi s from the available skeletal finds was 1 to 10% depending on the site and time period. This can be used to estimate the possible distribution during megalithic period in India. In view of the cultural practice of secondary burial and habitation during the megalithic period, which allows poor preservation of skeletal materials due to soil conditions, the Steinbach's lower estimate of 1% prevalence rate would be an underestimate, the actual rates would be higher. Even if 1% is accepted for the megalithic period as most plausible, it would mean a strong possibility of discovering further evidence of treponemal specimen and this might be if a proper re-examination of these unreported skeletal remains is undertaken. The validity of this expectation can only be proved by the future discoveries. Table 2 shows the vast possibility for such a re-examination of the available skeletal material for the study of paleopathological and other aspects of skeletal biology. In case such studies are not undertaken or attempted now, there is a danger that these skeletal remains may be lost for ever. This is because already several of the skeletal remains are untraceable and the rest are poorly preserved due to lack of proper care and interest. Besides, there are several new sites being discovered (e.g., Rao, 1989; Walimbe and Gambir, 1991; Kennedy 1990c; Kennedy et al., 1987, Kennedy and Deraniyagala, 1989, etc.) which all promise a vast potential source for paleopathological investigations, which might reveal further clues to the antiquity of the disease pattern, in particular to treponematosi s.

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