

A study of yaws among pygmies in Cameroon and Zaire

S. PAMPIGLIONE

Cattedra di Parassitologia, University of Bologna, Italy

AND

A. E. WILKINSON

V.D. Reference Laboratory, The London Hospital, London E.1

Surveys were carried out in the winters of 1969–70 and 1970–71 on groups of pygmies living in South Cameroon, the Bayaka and Badjelli, and in East Zaire, the Bambuti. They inhabit areas of primary rain forest with an environmental temperature of about 27°C. and a nearly constant relative humidity of 95 per cent.

Social conditions

The pygmies are nomadic hunters and gatherers living in small groups of twenty to sixty persons. Their main food is the game they hunt, including all the forest fauna, which ranges from mice to elephants, wild fruits, tubers, vegetables, and tree honey. At certain times of the year they go to Bantu villages and work on the plantations, and are given food in return for their labour. The Bantu regard the pygmies as an inferior race and treat them as their subjects. This relationship seems to have existed for a long time, and is accepted by the pygmies; however they maintain

Received for publication September 9, 1974

Requests for reprints to Dr. A. E. Wilkinson, as above

the right to leave if dissatisfied with their masters' treatment (Turnbull, 1965).

Disease is rife among the pygmy groups. In the Cameroon, intestinal parasites are very common (Pampiglione and Ricciardi, 1974): helminths are found in more than 90 per cent., and protozoa in about 60 per cent. Filariasis is also found (*Dipetalonema perstans* 48 per cent.; *Loa loa* 8 per cent). Vesical and intestinal schistosomiasis is rarely seen, but 33 per cent. of the groups studied had malarial parasites. Scabies, chigger infections, and cutaneous mycoses are common. A similar pattern of infestation is found in Zaire with the addition of infection with *Onchocerca volvulus*. Syphilis seems to be very rare among the pygmies and always of Bantu origin.

Scope of the survey

In the Cameroon, two areas were visited (Fig. 1); (a) two camps in the *Souspréfecture* of Lomié and (b) two camps in the *Souspréfecture* of Akom-deux. In Zaire, surveys were carried out at four camps in the Epulu area and one at Bafuakoa; these camps are in the district of Bunia,

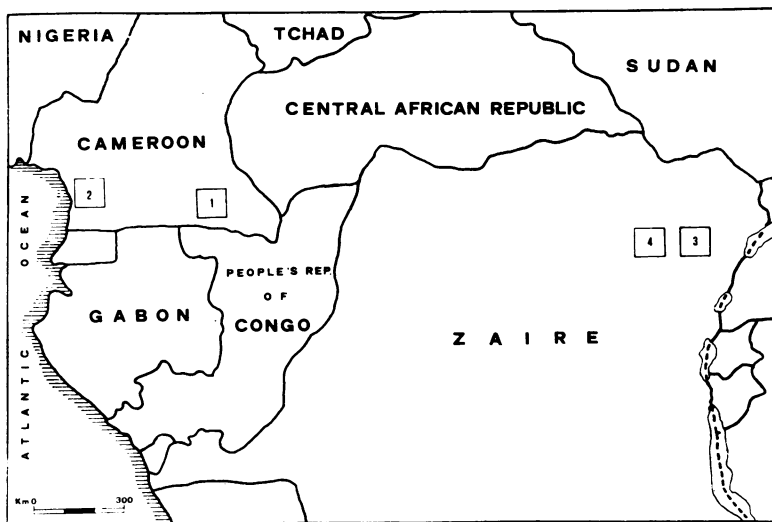


FIG. 1 *Location of areas surveyed*

- (1) *Lomié*
- (2) *Akom-deux*
- (3) *Epulu*
- (4) *Bafuakoa*

territory of Mambasa. Clinical examinations were carried out by S.P. and specimens of blood taken for a multi-purpose survey from a sample of the population. Adult patients with clinical yaws were treated with 1 mega unit procaine penicillin with aluminium monostearate (PAM); children were given 500,000 units. Supplies of PAM were left with nurses in the nearest villages with the recommendation that treatment should be repeated in 6 months' time; whether this was, in fact, done is not known. The immediate clinical response to treatment was very rapid.

Serological tests

Only small amounts of serum were available for examination at the V.D. Reference Laboratory. Many of these were turbid and unsuitable for flocculation or complement-fixation tests. FTA-ABS and VDRL tests were carried out on all the sera by the standard techniques (PHLS Monograph, 1972), but in many instances no result could be obtained with the latter test because of the turbidity of the sera.

Results

Clinical manifestation of yaws

In the Cameroon, fifteen of 333 persons examined (4.5 per cent.) had clinical lesions of yaws. These comprised:

Early cutaneous and mucosal lesions	3
Osteoperiostitis	2
Gangosa	1
Late plantar hyperkeratoses	1
Depigmentation with scarring	2
Other late lesions	6

In Zaire, twenty of out 205 patients examined (10 per cent.) had lesions of yaws. These included:

Early ulcerated cutaneous and mucosal lesions	15
Late lesions with scarring	2
Osteoperiostitis	1
Ulcerated nodule	1
Depigmentation with scarring	1

Examples of these lesions are shown in Figs 2 to 5. The early papillomatous lesions were all seen in children 3 to 8 years of age except in one case, a young adult about 14 years of age.

Serological results

The serological coverage of the camps visited is shown in Table I.

The discrepancy between the number of VDRL and FTA-ABS tests is due to the exclusion of



FIG. 2 *Papillomatous framboesides*

'unreadable' results with the former test because of turbidity of some of the sera.

FTA-ABS TEST

Reactivity of the FTA-ABS test in the different camps is shown in Table II and the distribution of reactivity by age in Tables III and IV.

VDRL TEST

The results of VDRL tests on persons in the various camps are shown in Table V and the age distribution of reactivity in Tables VI and VII.

Discussion

Unfortunately very few sera were available from children below the age of 12 years. The results of

TABLE I *Serological coverage of camps surveyed*

Country	Area of camps	Population	VDRL tests		FTA-ABS tests	
			No.	Per cent.	No.	Per cent.
Cameroon	Lomié	184	54	29	71	38
	Akom-deux	149	20	13	22	15
	Total	333	74	22	93	28
Zaire	Epulu	160	84	52.5	93	58
	Bafuakoa	45	24	53	30	67
	Total	205	108	53	123	60



FIG. 3 *Desquamative framboeside on the thorax and papillomatous lesions on the arm*



FIG. 4 *Sabre tibiae*

the FTA-ABS tests summarized in Tables III and IV show that in Cameroon two-thirds of the children



FIG. 5 *Dactylitis*

tested contracted treponemal infection by the time they reached the age of 12 years, and that thereafter the incidence of infection as judged by reactivity in the FTA-ABS test increased progressively until in the older age groups 80 to 90 per cent. of the population were affected. A similar pattern is evident from the survey in the camps in Zaire. All except one of the nine persons in the 13 to 20-yr age group had reactive FTA-ABS tests.

Strongly reactive VDRL tests may be associated with the presence of infective lesions, or in latent infections, with the potentiality of infectious relapse (Guthe, 1969). The incidence of VDRL tests reactive at dilutions of 1 in 16 or above was considerably lower in the camps in Cameroon than among those in Zaire (Tables V and VI), especially in the Bafuakoa area, where virtually all the VDRL results were of this titre. Early cutaneous or mucosal lesions were seen in three out of the 333 pygmies examined in Cameroon, but in fifteen out of the 205 examined in Zaire. Active transmission of yaws is obviously taking place in both areas but the situation is more serious among the pygmies in Zaire. False positive

TABLE II *Prevalence of FTA-ABS reactivity in camps surveyed*

Country	Area	Sera tested	FTA-ABS reactive	
			No.	Per cent.
Cameroon	Lomié	71	56	79
	Akom-deux	22	18	82
	Total	93	74	79.5
Zaire	Epulu	93	79	85
	Bafuakoa	30	30	100
	Total	123	109	88.5

TABLE III *FTA-ABS reactivity by age groups in Camps in Cameroon*

Age (yrs)	Population	No. tested	FTA-ABS		
			Negative	Doubtful	Positive
0-2	17	0	—	—	—
3-6	46	1	1	—	—
7-12	70	15	3	2	10
13-20	33	16	7	—	9
21-30	58	25	5	—	20
31-50	75	25	3	—	22
>50	34	11	—	1	10
Total	333	93	19	3	71

TABLE IV *FTA-ABS reactivity by age groups in camps in Zaire*

Age (yrs)	Population	No. tested	FTA-ABS		
			Negative	Doubtful	Positive
0-2	8	0	—	—	—
3-6	25	0	—	—	—
7-12	22	1	1	—	—
13-20	19	9	1	—	8
21-30	49	43	7	—	36
31-50	65	57	4	4	49
>50	17	13	1	—	12
	205	123	14	4	105

TABLE V *Reactivity in the VDRL test in the camps surveyed*

Country	Area	Sera tested	VDRL			
			Reactive		Reactive at titres ≤ 16	
			No.	Per cent.	No.	Per cent.
Cameroon	Lomié	54	39	72	16	30
	Akom-deux	20	17	85	4	20
	Total	74	56	76	20	27
Zaire	Epulu	84	68	81	41	49
	Bafuakoa	24	24	100	23	96
	Total	108	92	85	64	59

TABLE VI *Distribution of VDRL reactivity by age groups in camps in Cameroon*

Age (yrs)	Total population	No. tested	VDRL		
			Negative	Reactive	Reactive ≤ 16
0-2	17	0	—	—	—
3-6	46	1	1	—	—
7-12	70	10	3	7	2
13-20	33	13	7	6	2
21-30	58	19	4	15	7
31-50	75	22	3	19	8
>50	34	9	0	9	1
Total	333	74	18	56	20

VDRL results might have been anticipated considering the multiplicity of parasitic infections present in these populations; in fact, all the sera giving reactive VDRL tests were found to have reactive FTA-ABS tests.

Summary

In a survey of 333 pygmies in the Cameroon 4.5 per cent. were found to have clinical evidence of yaws.

This was also found in 10 per cent. of the inhabitants of camps in Zaire.

The results of VDRL and FTA-ABS tests on a sample of the population are presented. These provide evidence of a very high incidence of treponemal disease, 80 to 90 per cent. of the population showing serological evidence of infection. Active transmission is taking place in both areas but more frequently in Zaire.

TABLE VII *Distribution of VDRL reactivity by age groups in camps in Zaire*

Age (yrs)	Total population	No. tested	VDRL		
			Negative	Reactive	Reactive \geq 16
0-2	8	0	—	—	—
3-6	25	0	—	—	—
7-12	22	0	—	—	—
13-20	19	9	2	7	6
21-30	49	38	8	30	23
31-50	65	48	5	43	27
>50	17	13	1	12	8
Total	205	108	16	92	64

We wish to thank Prof. L. L. Cavalli Sforza, the Health Authorities of Cameroon, the Ministry of Health of Zaire (Dr. Kalonda), Mr. Biannic, Director of the Agence France Press in Yaoundé (Cameroon), Mrs. Biannic, and the Italian Ambassador in Cameroon, Mr. Marchetti, for their help.

The survey was supported by grants from the Italian National Research Council, The Wenner Gren Foundation, and the World Health Organization.

References

- GUTHE, T. (1969) *Acta derm.-venereol. (Stockh.)*, **49**, 343
 PAMPLIGIONE, S., and RICCIARDI, M. L. (1974) *Riv. Parasitol.* (in press)
 PUBLIC HEALTH LABORATORY SERVICE (1972) Monograph No. 1. 'Laboratory Diagnosis of Venereal Disease'. H.M.S.O., London
 TURNBULL, C. (1965) 'Wayward Servants'. The Natural History Press, Garden City, N.Y.