

## EPIDEMIOLOGY OF SCABIES\*

B. K. H. NAIR †   A. JOSEPH ‡   P. I. NARAYANAN ||   K. V. CHACKO §

### Introduction

Scabies as a disease entity has been known to man even from the dawn of civilization. But, scientific studies on scabies were made only after 1687, when Bonomo and Cestoni discovered the itchmite (*Sarcoptes scabiei*) and established its etiological role in the disease. In spite of extensive studies on the different aspects of the disease, there still remains many lacunae in our knowledge of this common malady which ranks third to fifth amongst the dermatoses of man.

The incidence of Scabies has been found to vary from time to time (Mellanby)<sup>1</sup>. According to Hebra and Hirsch the disease was common in Palestine in biblical times<sup>2</sup>. In the Middle Ages scabies was included as one of the eight known contagious diseases of man. (Friedman)<sup>2</sup>. It was very common during the First and the Second World Wars (Mellanby)<sup>1</sup>. By the middle of 1950s a progressive decline

in its incidence was noted in North America, Western Europe and Eastern Asia (Epstein)<sup>3</sup>. But, surprisingly there has been a resurgence of Scabies since 1963, a progressive increase in many parts of the world, to epidemic proportions in some areas (Orkin)<sup>4</sup>. The causes of these fluctuations in incidence are not known, though various theories have been brought forward. There still remains many controversies on the epidemiological aspects of scabies.

In India for the past 20 years scabies has persisted as one of the most common diseases. But, there have been very few epidemiological studies on scabies from this sub-continent apart from an unpublished report by Ramakrishnan et al<sup>5</sup>.

The aim of this study was to reassess the epidemiological aspects of scabies by means of a field survey and a review of the findings of earlier workers.

### Materials and Methods

The present study was undertaken in 1971 at Neendakara, a village on the west coast of Kerala, 60 Km. north of Trivandrum (latitude 8°N and longitude 70°E). It covers an area of 8 Sq. Km. and has a population of 18782 (density 2347/Sq. Km.). It is a fishing centre which has been developed by an Indo-Norwegian Project. The health problems of the locality were dealt by the Norwegians from 1954 to 1964. Thenceforth the health care of the area has been under the Trivandrum Medical College.

\* Based on a paper accepted for presentation at the joint Annual Conference of the Indian Association of Dermatologists, Venereologists and Leprologists at Udaipur in January, 1973

† Associate Professor of Dermatology and Venereology,

‡ Assistant Professor of Social and Preventive Medicine,

|| Lecturer in Bio-Statistics, Medical College, Trivandrum.

§ Officer in charge of administration, Indo-Norwegian Medical College Health Unit, Neendakara, Kerala.

Received for Publication on 2-11-1972

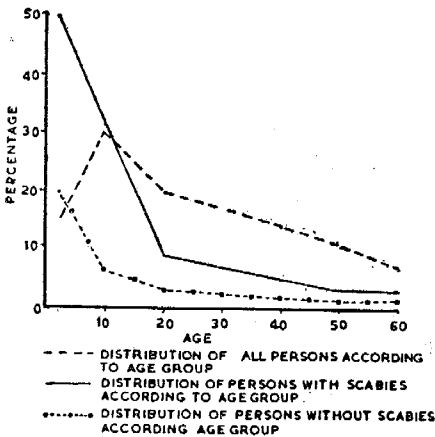
The survey was conducted by house to house visit. With a few exceptions all the inmates of each house were examined. The socio-economic and environmental factors were gathered with a special proforma. The diagnosis of scabies was made on clinical grounds.

**Observations and Discussion**  
**Prevalence of Scabies**

A total of 2558 persons living in 364 houses were examined. Of these, 152 persons living in 71 houses had scabies; that is, 6% of the population and 20% households had scabies.

The prevalence observed is low when compared to surveys done under similar conditions by other workers. Ramakrishnan et al<sup>5</sup> noticed a prevalence of 27% in Assam tea estates. Marples<sup>6</sup> found a prevalence of 22% in Samoa and 25% in Niue.

The relatively low incidence of scabies in this survey may be due to the better health care of the community and the fact that a mass treatment campaign was carried out by the Norwegians in 1956.



**Age**

In the population surveyed, the largest number of people were in the 5-14 age group, but the largest number of persons

with scabies were in the age group below 5. There was a decrease in the prevalence of scabies with increasing age (See table I). A separate analysis of the persons in the households with scabies also showed similar findings (See table II). Tables I and II and the graph clearly show that there was a decreasing prevalence of scabies with increasing age. The highest prevalence (50%) was in the age group below 5 and 31% was in the 5-14 age group; 81% of persons with scabies being below the age 14. Our findings are similar to those of Marples<sup>6</sup> who in Samoa and Niue found a decreasing incidence of scabies with increasing age and also that the highest incidence was in the age group below 5. The same views are held by Beek and Mellanby<sup>7</sup>.

**Sex**

In the population surveyed there was no significant difference in the sex distribution. Out of the 2558 persons examined 1333 were males and 1225 females. In the 152 persons with scabies 79 were males and 73 were females. There was thus no significant difference in the sex distribution, either in the population surveyed or in those with scabies. A sex difference in the prevalence of scabies was noted by Hebra and Mellanby<sup>1</sup>. In the 1860s in Vienna, Hebra noted that the disease was seven times as common in young men as in young women. In Britain, Mellanby found that adult females were affected twice as commonly as males. Both Hebra and Mellanby attributed this to sleeping crowded together, which was common among young male apprentices of Vienna in 1860s and young women during the War in Britain in the 1940s.

**Role of household contact**

Out of the total of 470 people living in the 71 houses with scabies 152, that is, one third had clinical evidence of

EPIDEMIOLOGY OF SCABIES

TABLE I

Distribution of all persons and those with scabies according to age groups

| Age groups   | All persons | Percentage | Persons with scabies | Percentage | % of persons with scabies in each age group |
|--------------|-------------|------------|----------------------|------------|---|
| Below 5      | 389         | 15.21      | 76                   | 50.00      | 19.53                                       |
| 5 — 14       | 782         | 30.57      | 47                   | 30.92      | 6.00  |
| 15 — 24      | 504         | 19.90      | 13                   | 8.55       | 2.60  |
| 25 — 39      | 423         | 16.54      | 9                    | 5.92       | 2.10  |
| 40 — 54      | 283         | 11.06      | 4                    | 2.63       | 1.40  |
| 55 and above | 172         | 6.72       | 3                    | 1.98       | 1.70  |
| Total        | 2,558       | 100        | 152                  | 100        | 6.00  |

TABLE II

Persons according to age group ; affected and non affected, in houses with scabies

| Age group   | Persons with scabies | Percentage | Persons without scabies | Percentage | Total |
|-------------|----------------------|------------|-------------------------|------------|-------|
| Below 5     | 76                   | 67.25      | 37                      | 32.75      | 113   |
| 5 — 14      | 47                   | 35.24      | 86                      | 64.76      | 133   |
| 15 — 24     | 13                   | 16.66      | 65                      | 83.34      | 78    |
| 25 — 34     | 9                    | 10.00      | 81                      | 90.00      | 90    |
| 40 — 54     | 4                    | 10.00      | 36                      | 90.00      | 40    |
| 55 and over | 3                    | 18.75      | 13                      | 81.25      | 16    |
| Total       | 152                  | 32.34      | 318                     | 67.66      | 470   |

scabies. Out of these affected, 123 were children below the age of 14. This shows that scabies is a contagious disease, which spreads within the household, where there is greater chance of intimate personal contact. It is more in children, as children generally tend to be scantily clad and run the risk of prolonged and intimate contact with other children and other members of the household. Similar findings were reported by Marples<sup>6</sup> in Samoa, where the social customs are like those in Kerala.

**Over Crowding**

The distribution of houses according to the size of household showed that the majority of houses had more than four members. (See table III). An analysis of the number of persons with scabies and their percentages in different

sized households, revealed, that there was no significant correlation with the size of the household and the prevalence of scabies (See table IV). However, there was a significant correlation between limitation of sleeping space and the prevalence of the disease (See table V).

Our findings are in conformity with the observations of Beek and Mellanby<sup>7</sup> that the most important means of transmission of scabies is prolonged intimate physical contact as in the sharing of a bed, or sleeping crowded together.

**Role of fomites**

There was no significant difference in domestic habits: such as the sharing of personal belongings like clothes and bath towels between those with scabies and those without it. This strongly

TABLE III

Distribution of houses according to the size of the household and number of persons with scabies

| Size of household | Number of Persons with Scabies |    |    |    |   |   |   |   |   |   | Number of houses |
|-------------------|--------------------------------|----|----|----|---|---|---|---|---|---|------------------|
|                   | 0                              | 1  | 2  | 3  | 4 | 5 | 6 | 7 | 8 | 9 |                  |
| 1                 | 2                              | —  | —  | —  | — | — | — | — | — | — | 2                |
| 2                 | 5                              | —  | —  | —  | — | — | — | — | — | — | 5                |
| 3                 | 13                             | 2  | —  | 1  | — | — | — | — | — | — | 16               |
| 4                 | 25                             | 6  | 2  | —  | — | — | — | — | — | — | 33               |
| 5                 | 38                             | 7  | 3  | 1  | 1 | 1 | — | — | — | — | 51               |
| 6                 | 38                             | 8  | 3  | 1  | 1 | 1 | — | — | — | — | 52               |
| 7                 | 39                             | 6  | —  | 4  | 1 | — | — | — | — | — | 50               |
| 8                 | 57                             | 1  | 1  | 3  | 1 | 3 | — | — | — | — | 66               |
| 9                 | 26                             | 3  | 1  | 1  | 1 | — | — | — | — | 1 | 33               |
| 10 and above      | 50                             | 3  | 2  | —  | 1 | — | — | — | — | — | 56               |
| Total             | 293                            | 36 | 12 | 11 | 6 | 5 | — | — | — | 1 | 364              |

TABLE IV

Distribution of houses according to the size of the household and the percentage of persons with scabies and without scabies

| Size of the household | Percentage of persons with scabies | Percentage of persons without scabies |
|-----------------------|------------------------------------|---------------------------------------|
| 1                     | 0                                  | 100                                   |
| 2                     | 0                                  | 100                                   |
| 3                     | 10.4                               | 81                                    |
| 4                     | 7.6                                | 76                                    |
| 5                     | 9.8                                | 74                                    |
| 6                     | 8.3                                | 73                                    |
| 7                     | 6.3                                | 78                                    |
| 8                     | 5.9                                | 86                                    |
| 9                     | 7.1                                | 79                                    |
| 10 and over           | 1.7                                | 89                                    |

TABLE V

Distribution of houses according to sleeping space

| Sleeping space | No. of houses all | No. of houses with scabies | Per-cent-age |
|----------------|-------------------|----------------------------|--------------|
| Crowded        | 295               | 64                         | 21.6         |
| Not crowded    | 69                | 7                          | 10.1         |
| Total          | 364               | 71                         | 19.5         |

suggests that fomites play a rather insignificant role in the transmission of scabies. This finding supports the

observations of Mellanby<sup>7</sup> who by a large series of experiments showed that the risk of infection from wearing garments or using bedding recently in contact with cases of scabies is less than 1% of the risk of sharing the bed with the same patients.

**Poverty and Poor hygiene**

All the persons surveyed belonged to low socio-economic group. Though the personal hygiene in the persons surveyed may be classified as good in only 5%, it was satisfactory in 79% and unsatisfactory only in 16%. There was no significant difference in the personal hygiene of those who had scabies and those without it. This is contrary to the common belief that poverty and poor personal hygiene tend to encourage the occurrence of scabies. Our findings support the observation of Orkin<sup>4</sup> who pointed out that despite continued improvement in the living standards of U. K. and Italy, there had been an increase in the incidence of scabies in these two countries. In contrast, despite the persisting impoverished circumstances in Vietnam, scabies has almost disappeared among the Vietnamese civilian population in the past several years<sup>4</sup>.

### Patient's concept of the disease

All those persons with scabies, and in the case of children, their parents, were questioned to find out their concept of the disease. It was found that 73% of those affected or their parents (where children were concerned) were totally ignorant of the etiology of the disease and its mode of transmission. 22% had such erroneous ideas as scabies was due to 'intestinal helmenthic infections', 'children playing in dirt', 'contact with soil' and 'excessive eating of sweets and wheat'. Only 5% had at least some idea that scabies is a contagious disease caused by some micro-organism.

### Treatment taken

In spite of free medical aid and health education from the health centre at this village, only 35% of those affected had resorted to modern medical treatment, 28% resorted to home remedies and 12% to 'native' forms of treatment and the rest 25% had no treatment whatsoever.

### Summary & Conclusions

This paper is an attempt to review and reassess the epidemiology of scabies by a field survey in a fishing village of Kerala.

A survey of 2558 persons living in 364 houses showed a prevalence of scabies in 6% of the population and in 20% of houses.

There was a significant correlation between age and prevalence of scabies. 81% of those affected were below the age of 14 and 50% were below the age of 5.

The most significant factor in the transmission of scabies is prolonged intimate personal household contact, and to this, over crowding, especially with regard to sleeping space, is an important contributory factor. The high incidence in children, is due to the fact that they have more chance of intimate personal contact, as they are scantily clad.

Poverty, poor hygiene, and the habits of sharing clothes and bath towels have not been found to be significant factors in the transmission of the disease.

Our findings are discussed with reference to those of earlier workers.

In spite of a free modern medical service, it was found that the majority of patients did not avail themselves of it. Most of the patients had no idea, or held erroneous ideas about the disease. This points to the importance of health education on the etiology, mode of transmission and treatment of scabies. The higher prevalence in toddlers and school going group of children show that more attention should be given to this vulnerable group.

This survey showed that health education, field surveys and domiciliary treatment are more likely to help in the control of this disease.

### Acknowledgment

We are grateful to Dr. N. Radhakrishnan, Principal, Medical College, Trivandrum for permitting us to publish this paper. Thanks are also due to Messrs. P. J. Iype and M. M. Shaffii of the Indo-Norwegian Medical College Health Unit, Neendakara for their valuable help in the field survey.

### REFERENCES

1. Mellanby K: Scabies, Oxford University Press, London, 1944.
2. Friedman R: The Story of Scabies, Vol I Froben Press, New York, 1947.
3. Epstein E: Trends in Scabies, Arch Derm 71: 192, 1955.
4. Orkin M: Resurgence of scabies, J Amer Med Assn 217: 593, 1971.
5. Ramakrishnan S P: Personal communication.
6. Marples M J: The ecology of the human skin, Charles C Thomas. Springfield, 1965.
7. Beek C H and Mellanby K: Hand book of Tropical Dermatology, Vol II, Elsevier, Amsterdam, 1953.