

FIELD TRIALS ON THE MANAGEMENT OF SCABIES IN JENGA TRIANGLE, PAHANG

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SUMMARY

A study was carried out in the Jengka Triangle in Pahang to find out the prevalence and a practical cum effective method of treatment and control of scabies. Scabies was the commonest skin lesion among the 5590 people examined, its prevalence being 11.6%. Both sexes were equally affected. Prevalence was high among children and teenagers, the worst affected being the 10 to 14, 2 to 4, 15 to 19 and 5 to 9 year olds. The problem of scabies in Jengka could be due to inadequate and irregular water supply, plus lack of mothers' supervision of the personal hygiene of their children aged > 2 years. The persistence of scabies since 1976 is very likely due to the people's non-compliance with standing instructions on treatment with Benzyl benzoate emulsion

A comparative study of treatment of scabies with Gamma Benzene Hexachloride [GBH] and with Benzyl benzoate emulsion [BBE] showed GBH to be the medication of choice. It was more effective and convenient, giving 97.9% cure rate with one application. A hot bath was not necessary. The patients preferred GBH to BBE since it was painless and without side-effects. The cost of treatment with GBH [1 application] was also much less than that with BBE [2 applications].

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Only 28.7% of the cases and contacts complied with instructions to do 2nd application of the medication on their own, making it imperative that application be done by the health Staff or under their direct supervision. The majority [87.2%] complied with instructions to place their used clothes in large polythene bags and air these in the sun for two days. This procedure should replace the instructions to boil personal clothes as it is just as effective, yet more convenient and economical. A regular, biannual screening of all kindergarten and primary school children is recommended. Application of GBH to all scabies cases and all close contacts should be done by the health worker. The whole body from neck to soles of feet should have the application, and the people should be instructed to bathe only after 24 hours. They are to go to the nearest clinic or hospital on the 7th day for second application of GBH, if the itchness or lesions persist or reappear. Such supervised medication is possible and will minimise misuse of GBH.

INTRODUCTION

SCABIES is a highly infectious dermatitis caused by infestation with *Sarcoptes scabiei*. It is a world wide problem, being prevalent among those living in poor socio-economic conditions, (Davey, 1961) and particularly among those with poor personal hygiene (Fain 1978). Since 1963 there has been a progressive increase in scabies in many parts of the world, reaching epidemic levels in some areas (Orkin, 1971). During the present century, Britain has experienced three epidemics of scabies. In the United States, the disease has increased noticeably. An epidemic was reported in Maine in 1971 involving one fifth of a community of 15,000 (Orkin, 1975). Scabies poses bigger health problems than its visible skin

manifestations, intense itchiness and sleepless nights. Whittle (1973) found scabies to be a leading cause of nephritis in Zaria, Nigeria. Svartman *et al.* (1972) found that scabies was a major cause of the largest epidemic of acute glomerulonephritis in Trinidad.

In Peninsular Malaysia, scabies continues to persist as a common communicable disease. The medical records in the Ministry of Health indicate that 104,233 scabies cases in 1970 and 97,828 such cases in 1979 were treated by the Government Medical and Health Services. These figures, however, do not reflect the actual extent of the problem since an unknown number resort to home/traditional remedies or go to private doctors. Traditionally, scabies in Malaysia has been treated with topical application of Sulphur Ointment or Benzyl benzoate emulsion. However, it has been observed that response to these drugs has not been satisfactory and has not contributed towards its control.

This study was to find out the magnitude of the scabies problem in the population studied and to evaluate the degree of effectiveness of Benzyl benzoate emulsion and gamma benzene hexachloride in the treatment of scabies.

BACKGROUND OF STUDY AREA

The Jengka Triangle, located in the centre of Pahang, is a huge Federal Land Development Project comprising of 28 separate schemes, growing mainly oil palm and rubber. At the time of this study, the Government medical and health services available in Jengka Triangle were, a Main Health Centre located in its town, a Health Sub-centre in Jengka 2 and Jengka 8 schemes, and a 'Klinik Desa' staffed by a community nurse or a midwife, in each of the remaining schemes. Each scheme had a kindergarten and a primary school. The water supply to Jengka was from reservoirs provided by the Public Works Department. The supply was irregular and limited, varying from a few hours in the day to one or two days in the week. The problem of scabies affecting 20 - 30% of the primary school children in Jengka, was first reported in 1976 by

Loesbroek, a German Peace Corps Nurse. Subsequently, the local health Staff carried out school surveys in Jengka and treated the scabies cases and contacts with either Benzyl benzoate emulsion or Sulphur ointment. However, when the U.S. Army Medical Research Unit (USAMRU) from the Institute for Medical Research, started its studies on Scrub Typhus in Jengka in mid 1977, the settlers urged for treatment for their persisting skin problem, which was causing a great deal of suffering among the infected families. Consequently, this study was planned.

MATERIALS AND METHODS

The total population of the three schemes selected, i.e. Jengka 15, Jengka 11 and 12, comprising mainly of Malays (99%) was included in the study.

About four weeks prior to setting up of examination centres for detection and treatment of scabies, the Wilayah Jengka officers and the general manager of each scheme, the Pahang Health authorities including their staff providing health services in Jengka, and the Block leaders from among the settlers, were briefed on the objectives and plan of action of the study in order to enlist full participation of the people and those who assisted. It was stressed to them that all members of every household in the scheme had to be painted with the medicine in order to ensure effective cure and control of the scabies.

Socio-demographic data of the population in the three schemes was collected. The households were given appointments for clinical examination at the centres specially set up for this study. They were also given instructions to have a bath with soap and water, those in Jengka 12 to have a hot bath, prior to coming to the centres. At the centres, all of them had their clinical history taken and medical examination done by Medical Officers. Diagnosis was established on clinical examination. (However, Nadchatram did skin scrapings of 15 cases and isolated *Sarcoptes scabiei* from 3). All members of the infected families had the medication applied by the health Staff, to the whole body from neck to soles of

feet. Application to the genitalia was by the individuals under supervision. They were instructed to have a bath only 24 hours after the application. If any persons had to wash hands or any part of the body, during the 24 hours, they were to reapply medication immediately after the purpose was served. Each family was given 5 mls of the medicine for this purpose. Gamma benzene hexachloride in cetomacrogol aqueous cream base (GBH), with the concentration of 0.5% for those below 2 years and 1% for the rest was used in Jengka 11 (1 application) and in Jengka 15 (2 applications). For the second application, the infected families in Jengka 15 were given 250 mls of the cream with instructions to reapply the medicine on the 7th day. In Jengka 12, the medication used was Benzyl benzoate emulsion (BBE), 12.5% for those below 2 years, and 25% for the rest. For the 2nd application of BBE by health staff, the infected families were instructed to come back to the clinic the following day after a hot bath. For disinfestation of clothing, all infected families were instructed to put clothes used by them in the past 48 hours, into large polythene (rice) bags, tie the bag-mouths, and air these in the sun for 2 days. Their beddings were also to be aired similarly for 2 days. All patients were reviewed in two weeks. Those not cured in Jengka 15 and 11 were given another application of GBH whereas persisting cases in Jengka 12 were given two more applications of Benzyl benzoate. A final review was done in six weeks. A patient was considered cured if itchiness and lesions had disappeared. Cases not cured at final review were given application of GBH.

RESULTS AND DISCUSSION

Out of the total population of 6032 in the three selected schemes, 5590 people turned up for examination, giving a response rate of 92.7%. 98% of the respondents were Malays, the rest being Indians (1.5%) and Chinese (0.5%). Table 1 shows the age, sex distribution of the population examined. Children and teenagers aged 2-19 years formed 49.2% of the population. By sex, 50.3% were males and 49.7% were females.

PREVALENCE

646 (11.6%) out of the 5590 people examined

had scabies. The prevalence was 7.9% (130 cases), 16.3% (365 cases) and 8.8% (151 cases) in Jengka 15, 11 and 12 respectively. These rates were comparable to prevalence among some European populations (Andrew 1976) but were lower when compared to the findings in Tanzania (Masawe 1975). Prevalence was 11.6% among the males and 11.5% among the females. Church (1978) obtained similar findings but Haribhakti (1970) showed that scabies was predominant among males in the ratio of 2:1. Table II shows

TABLE I

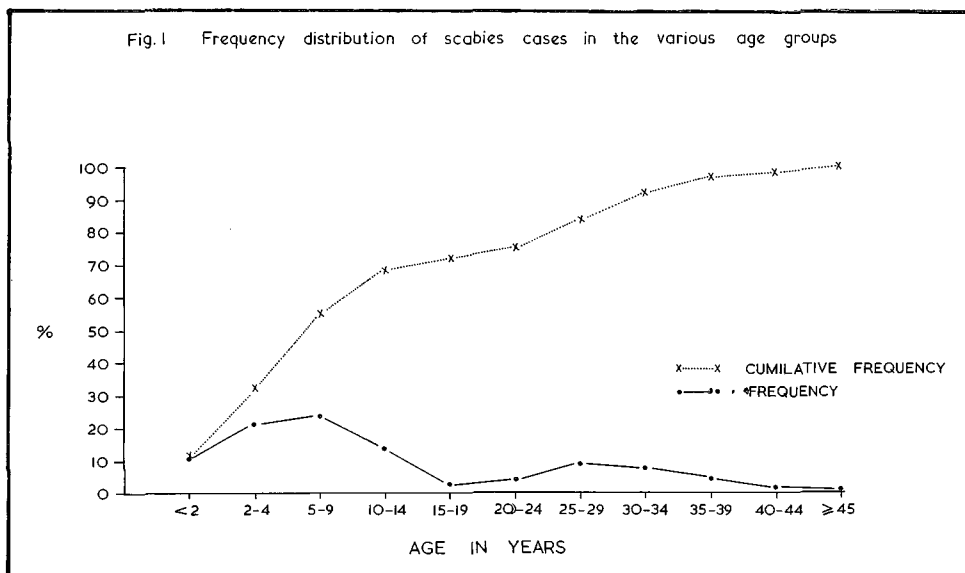
AGE AND SEX DISTRIBUTION OF THE POPULATION EXAMINED

Age group (years)	Male	Female	Total
< 2	295	281	576
2-4	457	418	875
5-9	594	612	1,206
10-14	273	258	531
15-19	67	74	141
≥ 20	1,131	1,130	2,261
All Ages	2,817	2,773	5,590

TABLE II

AGE-SPECIFIC PREVALENCE OF SCABIES

Age Group (yrs)	Population Examined No (%)	Population with Scabies No (%)	Prevalence per 100
< 2	576 10.3	65 10.1	11.3
2-4	875 15.7	137 21.2	15.8
5-9	1,206 21.6	153 23.7	12.7
10-14	531 9.7	92 14.2	17.3
15-19	141 2.7	19 2.9	13.5
≥ 20	2,261 40.0	180 27.9	8.4
Total	5,590 100.0	646 100.0	11.6



the age-specific prevalence rates of scabies in the 3 schemes. Prevalence was high among children and teenagers, the age groups most affected being the 10 to 14 and the 2 to 4 followed by the 15 to 19 and the 5 to 9 year age groups. Similar findings were obtained by Palicka (1971) and Nair (1973).

DISTRIBUTION OF SCABIES CASES

Figure 1 shows the distribution of scabies cases by the age groups. 62.2% of the scabies cases were children and teenagers aged 2 to 19 years who formed 49.2% of the population examined.

Table III shows the distribution of first scabies case in the infected family by age in Jengka 11 and 12. The first person to have scabies in each of the 161 infected families was identified by age. The majority (23.6%) were the primary school aged children (5 to 9 Years) followed by the 2 to 4 year olds (16.8%) and the 10 to 14 year olds (14.9%).

The high prevalence of scabies among the children and teenagers and the observation that children aged 5 to 9 years and 2 to 4 years as well as 10 to 14 years formed the majority of the 'first scabies cases' in the families is the result of the close contact among children in kindergartens and schools, the common practice of children

TABLE III

DISTRIBUTION OF FIRST SCABIES CASE IN FAMILIES IN JENGA 11 & JENGA 12.

Age Group (Yrs.)	No. of first scabies cases	%
< 2	9	5.6
2-4	27	16.8
5-9	38	23.6
10-14	24	14.9
15-19	3	1.9
20-24	3	1.8
25-29	23	14.3
30-34	16	9.9
≥ 35	18	11.1
Total	161	100

playing amongst themselves in their home compounds, and the poor personal hygiene among the 2 to 9 year olds because the mothers generally allow these children to wash and bathe themselves without assistance. In a survey done in Sheffield, Church (1978) observed that infection was introduced mainly by school children and teenagers, especially girls. Mellanby 1972 found that infection spreads from person to person, the closer and more prolonged the contact, the greater the risk of spread.

COMMON SITES FOR THE SCABIES LESIONS

In this study, the most common sites of the scabies lesions were the hands (71.7% of the cases); the next common sites were the arms (51.5% of the cases), the buttocks (44.1%), and the legs (43.8%). Scalp lesions were found only in the 0 - 4 year age group (2%) and the 10 - 14 year age group (1 case). These findings were very similar to those found by Mellanby (1972), and Davey and Light-body (1961).

TREATMENT

To compare the efficacy of gamma benzene hexachloride (GBH) with that of Benzyl benzoate emulsion (BBE), the cure rate of scabies cases in Jengka 15 and 11 who were treated with GBH was compared with that of cases in Jengka 12 treated with BBE. Mellanby (1972) recommended 2 applications of BBE on successive days or within a week. Harry (1976) recommended 3 applications of BBE on 3 successive nights. In this study, two applications of BBE on consecutive days were equated to and compared with one application of GBH. Table IV shows the number and percentage cured by the two methods of treatment, by age groups. Of the 150 cases treated with BBE, 86.7% were cured. On the other hand, among the 332 cases treated with GBH, the cure rate was 97.9%. By using 't' test of significance at 95% confidence level it was noted that there was a significant difference in the cure rates. The male/female and the age group classifications for both treatments did not show any significant difference. This was determined using the chi-square test.

It was observed that when BBE was applied over skin abrasions and ulcers, it caused burning sensation which made the small children cry. The situation was made worse when some of the crying children rubbed their eyes with hands painted with Benzyl benzoate, the eyes became red and swollen immediately. Of the children who had the first application of BBE 7.9% did not turn up for the second application, because the mothers did not want their children to suffer the same pain and discomfort. Applied on people with prickly heat it was found to make the condition worse. These side effects were not observed with GBH nor were there any side or toxic effects even though it was applied to skin lesions other than scabies in all age groups. Church (1978) and Mellanby (1972) also found that Benzyl benzoate caused dermatitis and burning sensation of the skin. Haribhakti (1976) observed similar side effects with Benzyl benzoate but did not find any intolerance or sensitisation with GBH. Benenson (1950) found 0.5% solution of GBH as effective as 25% BBE and without any side effects.

Buelah (1976) recommended that high doses and prolonged contact with GBH should be avoided. Orkin (1978) has stated that the recent re-evaluation of the risk-benefit relations of GBH has shown that it is easy to use, effective, allergic contact dermatitis has not been documented and clinical central nervous systems toxicity has been limited to misuse situations. Haribhakti (1976) has shown a cure rate of 91.07% after application of 1% GBH cream for 7 days. Faustus (1964) found 100% clinical cure with 1 to 3 applications of 1.5% ointment base of GBH. Harry (1976) has recommended two applications of 1% GBH at 7 days interval. He also found that treatment of the contacts was necessary even if they were free from symptoms at the time of examination. Benenson (1970) found that for 5 5% of the cases a 2nd application of GBH was necessary after 7-10 days. Wilcocks (1966), Cannon (1948), Smith (1967) and Rowland (1967) have shown that one application of 1% GBH has been successful in the treatment of scabies.

During this study period, dust samples from

the floors, beddings and clothings were collected from 45 houses in the study area which included houses with scabies cases. *Sarcoptes scabiei* was not isolated in any of the samples (Nadchatram - pers. comm). Mellanby (1972) and Fausts (1964) noted that infestation by indirect transmission was uncommon and of little importance. Usually, close contact over long periods, such as sleeping with the infected person, is necessary for the transfer of the mites (Baker *et al.*, 1956).

COMPLIANCE WITH INSTRUCTIONS.

Bathing with hot water:

The population in Jengka 12 was interviewed regarding their hot bath prior to coming for examination. Of the 1721 people from 362 households, only 14% had a hot bath, 74% had a cold bath while 12% did not bathe. Among the reasons given by the 362 households for non compliance by one or more members were that they (46.1%) were used to a cold bath, that they (18.8%) did not have adequate facilities to boil water for the whole family (e.g. large enough

TABLE IV

NUMBER AND PERCENTAGE OF SCABIES CASES CURED BY THE 2 METHODS

Age groups (yrs)	Treatment with G.B.H.						Treatment with BBE	
	No. with 1 appln. A	No. Cured (%)	No. with 2 applns. B	No. Cured (%)	No. with > 2 applns. C	No. Cured (%)	No. with 2 applns. D	No. Cured (%)
0 < 2	26	25 (96.2)	3	3	14	13	22	16 (72.7)
2-4	66	65 (98.5)	13	12	16	14	39	36 (92.3)
5-9	78	78 (100)	8	8	33	33	33	28 (84.9)
10-14	59	59 (100)	1	1	6	4	19	15 (78.9)
15-19	9	7 (77.8)	1	1	2	2	2	2 (100)
> 20	94	91 (96.8)	12	12	27	26	35	33 (94.3)
Total	332	323 (97.9)	38	37	98	92	150	130 (86.7)

- Total No. given treatment differs from total no. of scabies cases in Table 1 because cases not reviewed have been excluded.
- Columns A and D are used for t test and chi-square test.
- Columns B and C show non compliance to instructions for 2nd application at home.

cauldron, the kerosene (fuel), and/or the time). 2.7% said that they were lazy. The rest either did not reply or gave irrelevant answers.

Second application of GBH:

In Jengka 15, instructions were given to the scabies families to reapply GBH to all scabies cases on the 7th day. Out of the 130 cases, 122 were reviewed and it was found that only 28.7% had the second application as instructed. 55.7% had more than two applications 15.6% did not apply it at all. Thus, majority (71.3%) of the cases did not adhere to instructions. Similar findings were observed by Church (1978).

Airing of Clothes:

The infected families in Jengka 11 and 12 were reviewed regarding this instruction. Out of the 188 families who had been asked to air their personal clothes and bedding, 164 complied with the instructions, giving a high compliance rate of 87.2%.

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