

A study of treatment seeking behaviour for malaria and its management in febrile children in rural part of desert, Rajasthan, India

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Abstract

Background & objectives: For management of malaria, there is a need to give attention on specific group of people like children <5 yr of age in the community. They are unable to explain their feelings about severity of illness and effects of treatment on health and they are dependent on others for their health care, therefore, it is the mother who can seek, obtain, and use medication appropriately. This is directly linked to the level of education, socioeconomic status, timely decision, accessibility of health facility, correct use of drugs and their follow-up. The present study was undertaken with the aim to know the basis on which malaria was recognized and classified and exploring factors involved in the selection of different treatment options in the desert population of Rajasthan.

Methods: Interview and observation techniques were used for data collection in 15 villages of Ramgarh PHC in Jaisalmer district of Rajasthan state, India. A total of 164 mothers were interviewed and observations were made by the investigators in the group discussions who utilized health facility for the febrile children <5 yr of age.

Results: More than 93.3% mothers started taking care at home for their febrile children and watched for improvement on an average up to 72 h. When they thought there was no hope to manage the case at their level, they shifted their febrile children to the nearest health facility such as sub-centre/PHC/private health practitioner. Utilization of health facility was linked with the age of the child, with younger children (<24 months of age) being significantly more likely to be utilized nearby health facility than 24–59 months children. Children judged as severely ill by their mothers utilized health facility significantly more often than those not thought to be severely ill. Mothers from households where the household heads had a primary or secondary education were more likely to utilize health facility than those household heads having no education. Similarly, mothers from households with moderate or high income utilized health facility more frequently than those with low income.

Interpretation & conclusion: The study revealed that mothers usually tried to manage febrile cases at their own level at home for children <5 yr of age. They had gone through different treatment options before utilizing health facilities. There was, on an average three days delay in seeking care in the remote villages of desert part of Rajasthan. To minimize the delay in diagnosis and treatment of malaria among the children <5 yr of age is an urgent need for intervening through IEC programme and trained volunteers for the management of malaria cases at village-level.

Key words Children; desert; malaria; Rajasthan; treatment seeking behaviour

Introduction

Malaria is one of the most important tropical diseases, widespread throughout the tropics, but also

occurring in many temperate regions. It exerts a heavy toll of illness and death—especially amongst children and pregnant women. The world-wide statistical data reveal that cause of fever in children <5 yr of age is

malaria in majority of cases. Delay in diagnosis and treatment of malaria increases morbidity and mortality both in the community and specifically in pre-school children^{1,2}. There are several factors which are responsible everywhere for this disease, particularly in rural communities. Sociocultural beliefs about the causation of disease and its curability have direct correlation with the treatment seeking behaviour of the people³. The choice of treatment source was found to be influenced by accessibility, disease type and severity, patient's gender and parents' educational level⁴⁻⁶. Attitude of users towards health care providers is also an important factor⁷. Patients are more likely to start with self-treatment at home as this practice yields them to minimize expenditure and sufferings in remote areas where transport and health facility are the problem⁸⁻¹⁰. In desert part of Rajasthan, about three-fourth of the patients in rural areas administer anti-malarial drugs without laboratory confirmation with preference of injectable forms¹¹. The present study was aimed to identify different community beliefs and practices on the basis of which fever could be recognized and classified and explore factors involved in selection of different treatment options in great Indian Thar Desert and to compare with other studies in different parts of the world.

Material & Methods

Study area: The Thar Desert spreads across the State of Rajasthan and parts of Gujarat in western India covering about 2,59,000 km². At present, the Thar Desert of Rajasthan, comprising 12 districts, is spread over a 28,600 km² area, which is 12% of the mainland of the country and 62% of the total area of the state. It harbours a population of 13.4 million, with an average density of 64 persons per km², making the Thar Desert region as one of the most populated deserts in the world. The climate is characterized by extremes of temperature, varying between 4°C in winter and around 50°C in summer. The rainfall is poor and erratic, ranging from 400 mm in the eastern part of the desert to less than 100 mm in the western fringe. For this cross-sectional community-

based study, Jaisalmer district was selected out of 12 desert districts in Rajasthan state as it was perceived to meet many criteria such as API which is highest among all the 12 districts in last five years. In India, Jaisalmer district is the biggest in area and having a very thin population density, i.e. 9 persons per km². Malaria in desert is highly problematic due to mismanagement of water supply to the villages for irrigation and drinking purposes through distributaries of *Indira Gandhi Nahar Pariyojana* (IGNP).

Sample size and sampling technique: Ramgarh PHC was having highest API among all the PHCs within the District Jaisalmer. Based on this criteria, out of 60 villages in Ramgarh PHC, 15 villages, namely Seowa, Raghwa, Raimala, Sultana, Nagga, Bada, Mokal, Lanera, Habur, Kakab, Hamira, Tibansar, Chandane ki Dhani, Markh ka Ganv and Mohammad Khan ki Dhani were selected randomly. A list of mothers of selected villages was obtained from the PHC/Sub-centre's record who visited for their febrile children <5 yr of age within 90 days. Thus, 164 mothers were included who consented to participate in the study. This sample size was >90% of the obtained list of mothers which was true representative of the same. Focus group discussions (FGDs) were carried out in the selected villages and each mother was interviewed separately within 90 days from the date of survey.

Data collection, management and analysis: The data were collected on the pre-coded and pre-tested schedules. The questionnaires were prepared in English but were communicated to the informant in Hindi or local dialect, i.e. Marwari (dialect of people in Thar Desert). FGDs were also held in the selected villages by the investigators with the mothers of febrile children. All the guidelines for FGDs were followed to control quality of the data. The DILO (a day in the life of villagers) methodology was also adopted¹². Recall memory method was used for collecting the information from the respondents by carrying out door-to-door survey. FGDs were also held on some events such as marriage, birth day and so on in the study villages. Collected data from the field

were computed for the appropriate analysis and interpretation.

Ethical considerations: This study was approved by the Scientific Advisory Committee (SAC) and Ethical Committee (EC) of the Centre. In each village before starting the study, rapport was established with the community leaders, heads of the household, village officials such as teacher, *Wardpanch*, *Sarpanch*, *Patwari* and the informants. The aims and objectives of the study were explained to them for their cooperation and participation in the study.

Results

Sociodemographic characteristics of the subjects: Majority of the mothers (65.9%) were Hindus, 29.6% of whom belonged to scheduled castes & scheduled tribes (SCs & STs) and 32.3% were other backward castes (OBCs). About three-fourth (76.8%) of mothers were in the age group of 20–39 yr. More than half (51.8%) of the mothers were illiterate while 23.8% had primary or higher education. About 88.4% subjects belonged to low and moderate socioeconomic class (Table 1).

Identification, classification, symptoms of malaria and action taken for febrile children: Mothers were observing illness of child by his or her dull appearance and inactive in routine activities and they were calling “TAV” to the fever in their local dialect. They explained TAV is raised temperature of body (hot body) as compared to normal. They confirmed fever by touching body of febrile child and classified as low, moderate and high based on the degree of past experiences and feelings of sensation. About 115 (70.1%) mothers confirmed fever by touching body and felt ‘hot’ and nearly 22 (19.1%) of mothers confirmed ‘hot body’ and other symptoms such as headache, restlessness, diarrhoea, rash on the body as symptoms of the disease. Few identified fever or fever with other signs and symptoms as a common cause followed by cold and cough or chest infection. Besides in-depth discussions they expressed fever is dangerous, if it is not cured, it leads further compli-

Table 1. Demographic characteristics of the respondents

Variables	Number (%)
<i>Age</i>	
<20	3 (1.8)
20–29	71 (43.3)
30–39	55 (33.5)
40–49	35 (21.3)
<i>Education</i>	
Illiterate	85 (51.8)
Literate	40 (24.4)
Primary	21 (12.8)
Middle	8 (4.9)
Secondary	7 (4.3)
Senior secondary and above	3 (1.8)
<i>Occupation</i>	
Housewife	64 (39)
Agricultural labour	43 (26.2)
Labour	39 (23.8)
Service	11 (6.7)
Others	7 (4.3)
<i>Religion</i>	
Hindus	108 (65.9)
Non-Hindus	56 (34.1)
<i>Caste</i>	
GC	39 (36.1)
OBC	37 (34.3)
SC/ST	32 (29.6)
<i>Mothers according to socioeconomic status</i>	
Low	92 (56.1)
Middle	53 (32.3)
High	19 (11.6)
<i>Mothers according to children (13–59 months)</i>	
Single child	12 (7.3)
More than one child	152 (92.7)
<i>Children according to age (months)</i>	
<13	26 (8)
13–23	49 (14.9)
24–35	61 (18.4)
36–47	88 (26.8)
48–59	105 (31.9)

cations in the body and ultimately death in FGD of mothers. Without naming disease, they explained signs and symptoms of malaria, i.e. loss of appetite, vomiting, spleen enlargement, shivering and so on.

Table 2. Mothers response to fever (n=164 unless indicated)

Variables	Number
Mothers recognized fever as hot body or "hot body with other symptoms or signs"	115 (70.1)
Mothers defined malaria as "fever or fever with other symptoms or signs"	137 (83.5)
Mothers blamed malaria for the child's current fever	65 (39.6)
Mothers believed that the common cause of fever in the area is malaria	113 (68.9)
Mothers seeking advice from any source before going to health facilities	90 (54.9)
Mothers who gave the child any sort of care before going to health facilities	61 (37.2)
The care given to the child was drugs (n=61)	38 (62.3)
Village is the source of the care given (n=61)	34 (55.7)
Duration (in hours) of response from the initiation of fever (Mean \pm SD)	70.3 \pm 40.1
Mothers now in this facility because child condition deteriorated	126 (76.8)
<i>Decision for going to health facility was the decision of:</i>	
Mother	72 (43.9)
Father	25 (15.2)
Mother/Father	55 (33.5)
Others	9 (5.5)

The figures in parentheses indicate percentages.

About 54.9% mothers sought advice from sources other than health facilities initially; of those (62.3%) have given drug to their children. The mean duration was 72.3 h between the time periods from child suffered from fever and attended a health facility. Mothers at last utilized health facility due to non-response of the other sources of treatment of febrile child. They preferred to utilize nearest health facility when ever child was very serious. Majority of the mothers travelled more than 5 km for the nearest health facility and >90% of than used hired/owned transport to reach the nearest health facility. Jeep/tractor/camel cart were the main transport mean used by the mothers. Nearly three-fourth mothers were living in *Dhanies* (Dhani is hamlet away from the main village and situated mostly in farms) and out of these *Dhanies*, 87.5% are spread over at the distance of 1–10 km² from each other and connected with *kuchcha* roads with the main villages (Table 2).

Available options for treatment of children: Table 3 shows availability, preferred and actual practice related to treatment of fever in children in desert. Use of traditional medicine based on the knowledge and experiences of mothers or elderly women of family or experienced and practicing women within their

community, consulting health workers at Sub-centre/Primary Health Centre, use of herbs and self-treatment were available options for selection of health care for the febrile children. The net outcome of FGD of mothers, it was noted that it was not necessary to follow the same pattern in all the cases. It was found that some ill people think about consulting health workers such as Doctor/MPW/ANM at the health

Table 3. Preferred and actual practice related to treatment of febrile children

Variable	Number
<i>Mothers prefer to seek advise from:</i>	
Health worker such as Doctor/MPW/ANM	123 (75)
Grandmothers, grandfathers, neighbours and community	11 (6.7)
Village volunteers	7 (4.3)
Others	5 (3.1)
<i>Mothers actually sought advise for this event from:</i>	
Health workers such as Doctor/MPW/ANM	130 (79.3)
Grandmothers, grandfathers, neighbours and community	13 (7.9)
Village volunteers	2 (1.2)
Others	4 (2.4)

The figures in parentheses indicate percentages.

facilities or at health workers home or if the patient couldn't move they ask the health worker to visit them at home. During adverse weather such as extremes of summer (May and June when temperature is about 50°C), one of the patient's relative visits the health worker at home and describes the patient's symptoms and accordingly the drug is given to this relative for the patient. In some cases if the child didn't recover, they changed the health personnel.

Practices to treat febrile children in desert: It was the common practice among the study mothers to treat febrile child herself at home. The justifications were given by the mothers for health practices with full confidence and beliefs that they were able to get rid off suffering from fever within or before the time period of reaching health facility, non-availability of public transport from the *Dhanies* of febrile child to the health facilities, it was costly for them to use the transport on individual hire basis. Some mothers expressed non-availability of transport facility in and around their *dhanies* and very few mothers told that health personnel were not available at health facility at the time of urgency of the febrile child due to off time of the health staff at the place. In some cases, mothers were not sure about the febrile child suffered from malaria and they consulted the elderly people in the community, if they agreed that the sickness of the child was malaria they administered anti-malarial drugs. They used chloroquine, aspirin and paracetamol to treat the child. These medicines were purchased from the nearest medical shops. The anti-malarial dosages were given based on the experience of the mothers and conditions of the child.

Reasons for selection of different treatment options: The health seeking behaviour of the children was based on the level of educational status of the parents. There was significant association between father education and consulting health workers within 24 h of the onset of fever ($p < 0.05$). Furthermore, in detailed investigations, average delay period was reported nearly 10 h for consulting health workers in case both (the parents) were educated as compared to one. In most of the cases it was based on severity

of the illness of the child. If the child was suffering from high fever, repeated vomiting, unable to stand or walk, unable to suck mother's milk, stopped eating, loss of consciousness, yellowish sclera, severe diarrhoea, and deteriorating conditions of the febrile child compelled to take child to the health facility. In this situation they felt themselves helpless and wanted to consult health workers without delay. But at the same time if it happens during the night they wait till morning. Severity of illness and situational compulsion did not show significant association with the education of febrile child parents.

Certain foods preferred and avoided during illness: Majority of the mothers restricted dietary intake of febrile child during illness and about half (52.4%) of the mothers avoided to give fried foods but at the same time they preferred to give 'rabadi' (local preparation made from millet flour and yogurt), 'Khichchadi' (a semi-liquid preparation from the mixture of rice and pulses) and 'mateera' (fruits of a cucurbitaceous plant akin to water melon) to their febrile children. Almost all the mothers gave milk to febrile children during their illness and as well as after cure for the period of one to two weeks for recovery of health.

Discussion

Review of literature on desert malaria depicts that Thar Desert was known to be malaria-free zone before existence of IGNP. Population was less immune to malaria parasite and unaware about its management. Extensive irrigation from IGNP and improper water management created conducive environment for breeding of malaria vectors and transmission of the disease took place in the population because of flow of positive malarial parasite migratory population in the area. Studies on malaria in this region show the occurrence of several epidemics and many human lives lost due to malaria in the past two to three decades. Presently, malaria is one of the serious public health problems. Under the plan of effective management of malaria in the community it is important to advise properly by the health facilitators on one

hand and to obtain, use the drugs appropriately and take full treatment by the consumers as per prescription of treating physician on the other hand¹³. This thing would be only possible when people take decision timely for the diagnosis and treatment. Health facilities need to be accessible to all but in the desert part of Rajasthan it was reported difficult to access health facilities to desert population because of Thar Desert is thinly populated, distances are more between health facilities and remote places where population live. Mostly, these villages/dhanies are not connected with *pucca* roads and there is either no or less facility of transport. Health facilities establishment in the area are found similar based on the population criterion throughout India, though there is need to establish one specific desert-based criteria.

It is very essential for the parents to recognize and classify the disease among the children <5 yr of age who suffered from malaria. It is very interesting to learn from this study that fever and malaria were understood correctly by the majority of the mothers and malaria was identified as a main cause of fever. These findings have been shown to be the key to intervention in rural desert part of Rajasthan. The results of this study depicted the level of knowledge about malaria, responsible vectors, its transmission and prevention. Furthermore, in investigations they stated that high fever, giddiness, repeated vomiting, severe diarrhoea, inability to get up from bed to sit and stand up or walk even up to bath room, loss of appetite and refusal to feed, loss of consciousness and yellowish sclera were the recognized signs and symptoms of the disease. If malaria episode evolved into a more serious situation (severe malaria) that requires urgent treatment at health facilities. The results of this study were consistent with similar studies carried out in other parts of the world such as Sri Lanka¹⁴, Africa^{8, 15, 16} and Sudan¹⁷. The study reveals that four types of treatment of malaria were used by people to treat febrile children in desert villages of Rajasthan. Both the options of treatment such as self-treatment at home and utilization of government health facilities were being used to treat malaria in the children < 5 yr of age in the study area.

Third and fourth options, i.e. traditional medicines and herbs were also used by the population for the treatment of malaria. Utilization of different types of health practices was a common practice in the study villages. Studies reveal that six types of treatment choices were in Philippines¹⁸ and public health institutions, private health practitioners, traditional healers and self-treatment were the choices in Uganda¹⁹ also. Similar observations are made by other researchers also from various parts of the world.

Treatment at home to cure fever among the children <5 yr of age was commonly practiced by the parents before going to health facility in Tanzania²⁰. Another study in Kenya⁸, reported that different types of treatment options were used by the parents but all these were dependent on the duration of illness, seriousness of child, and cost of treatment. Treatment seeking behaviour was almost similar in all the studied villages. Little variations were noted among the different religions and castes. Mothers started treatment for the febrile children at home in all the communities with great believes and hope to cure fever of children. They used whatsoever was available with them. They generally used local herbs which were easily available, left over unused medicines by the family members for the same suffering, drugs purchased from the local shops based on their own knowledge and experience and the advice of the drug sellers. At last if all the attempts fail to cure fever of the child and deterioration in the health noticed continuously day-by-day, then parents rushed to the nearest health facility to seek the advice of the health personnel as well as for treatment. Based on the study results two most prominent factors which were found affecting the early diagnosis and treatment of the children severely ill child who needed urgent consultation with the health personal in minimum time and child who fell ill during nights, and parents have to wait till morning and illness duration increasing beyond control.

Other studies also reported barriers and area specific difficulties in early diagnosis and treatment of febrile children in different parts of the world. In a

study in Uganda, Nuwaha reported long-waiting time, health workers abusing patients being given tablets instead of injections as important barriers¹⁹. Hill *et al*²¹ found financial access as a major barrier to care seeking in Ghana. To cure malarial fever among the children <5 yr of age in the desert villages of Rajasthan self-treatment and use of traditional medicines were the common practice. Similar findings have been reported in Tanzania¹⁵. Dominating and decision taking by male in family was found in the study villages but it was surprising to note that seeking health care at health facilities was decided by the mothers. However, Nsungwa-Sabiiti *et al*¹⁶ stated in Uganda study that mothers decided only when treatment was uncharged. Present study gives the true picture of study villages that PHCs/Sub-centres services are not able to control malaria in the desert villages so that case management practices at the community level seems very essential. This could be made possible by giving proper training to the mothers to recognize the proper malarial symptoms at early stage and knowledge of proper and required doses of antimalarial drugs and skill for case management at home. This type of community participation for control of malaria may help to reduce the incidence of malaria and death in the community. This behaviour is also practiced in others parts of the world^{22, 23}.

Conclusion

Existing health facilities in desert part of Rajasthan are inadequate to control malaria. Thar Desert is thinly populated and distance from the remote villages/dhanies to existing health facilities is more as compared to non-desert. These health facilities provided in the region are similar to establishment of health services on population basis in non-desert. Users may want to seek advice from health personnel but they are unable to due to lack of connectivity with public transport. Therefore, home management strategy to control malaria may be encouraged by the community partnership. Volunteers may be selected at village level and make them trained for the proper diagnosis, administration of appropriate doses

of antimalarial drugs and case management at home. This approach may be helpful to reduce the burden of disease and prevent the deaths due to malaria. After giving medical aids at village-level, cases may be referred to nearest health facility to avoid further complications and better health care.

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