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VARIOLATION IN THE RAJASTHAN DESERT

by

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Introduction

Smallpox was one of the most devastating diseases known to mankind. Numerous methods were employed to afford protection from the disease, from worship of a mother/goddess, to the practice of variolation. Variolation (attempted protection by deliberate inoculation with smallpox virus) dates from at least 600 BC.[1] Its practice was known to be common in the desert regions of Pakistan and Afghanistan. In India variolation was thought to be an unknown, or at least an uncommon, practice. It seemed unlikely, however, that variolation stopped at the Indian border, and so a special survey was conducted.

Rajasthan is the second largest Indian state in area. The Thar Desert, in its western part, is an area particularly difficult to search because of the nomadic lifestyle of the people, its remoteness, and its inaccessibility. For the above reasons, selected areas were chosen for a special search. (Figures 1 and 2.)

Method

Eight PHCs (primary health centres) in the districts of Bikaner, Jaisalmer, and Barmer, were chosen for their inaccessibility and previous poor smallpox search record. Nine mobile teams were formed each consisting of a medical officer, three vaccinators and a driver. They were given a schedule of villages or "dhanis" (hamlets of one to 10 houses) to search during a 10-day period.

Three assessment teams consisting of a medical officer and state level PMA (paramedical assistant) were created. Two of those teams had the following objectives:

(a) to assess the practice of variolation, i.e. if it occurred, and whether stored scabs could act as hidden foci for reinfection;

(b) to assess the vaccination status of selected samples of the population;

(c) to assess the special desert search.

Assessment technique

There was a random interview/survey in seven of the eight PHCs. Questions included demographic data (identification of persons by age, sex, religion and language) detailed information on variolation, vaccination status, and information on smallpox transmission in their area. Finally the person was asked about knowledge of the special desert search - whether he had seen the recognition card, knew about the 1000 rupees reward for reporting a confirmed case of smallpox and whether he knew where to report a suspected case.

Each individual was examined for:

(1) facial pock marks (at least five depressed scars having a base of 2 mm or more);

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(2) primary vaccination scar (both arms examined);

(3) variolation scar (a characteristic scar found on the right wrist in the area known as the "anatomical snuffbox".

Population surveyed

Of 253 persons (139 males, and 114 females) interviewed (Table 1), there were 101 (40%) Hindus and 152 (60%) Muslims; 49 (19%) were children under 15 years of age. Although Jaisalmer, Barmer and Bikaner are the three largest districts by area in Rajasthan, their population density is 4 km^2, 27 km^2, and 21 km^2 respectively. In Rajasthan as a whole, the composition of the religious community is 90% Hindu, 7% Muslims and 3% others. However, in the desert area, there is a higher proportion of Muslims; 24% in Jaisalmer, 12% in Barmer and 11% in Bikaner. There is a high concentration of Muslims along the border and close ties are maintained with relations in Pakistan.

Results

Variolation was a well-known procedure confined exclusively to the Muslim community. The variolator is a member of the "Bardi Fakir" sub-caste. A fakir is regarded as a religious priest/saint, credited with having supernatural powers. He was also involved in various religious ceremonies and methods of healing the sick.

The Muslim community was extremely reluctant to discuss the practice or to provide the names of the fakirs for fear of reprisal. Once assured that this was not so, the names of three fakirs were mentioned repeatedly. Two of the three are now deceased. The remaining one was absent from the dhani when we arrived but his wife provided information.

When a smallpox outbreak occurred, it was the practice to send a camel to collect the fakir. On arrival at the village the variolator would collect scabs from an infected person. Preferably this was someone from a low caste as it was felt that the disease was milder in the lower socioeconomic groups. The scabs were placed in a sea shell and dissolved in human milk. Seven needles were bound together with thread and used in a similar manner as the bifurcated needle. The right wrist was always the site of variolation and it bore a permanent scar. A "Beri ka Patta" (leaf of the Beri fruit) was placed on top of the puncture wound and bandaged in place. Eight to 12 days later a typical smallpox rash usually appeared.

The villager's concept of variolation was as follows: it either completely protected against the disease, or produced a milder form of Bari Mata (smallpox). They were able to "have the disease" when it was convenient and not "at the wrong time". If it came at the wrong time it might be more malignant. When the fakir visited, all those unprotected were brought for variolation.

In Table 2 the age-groups of Muslims with variolation scars are shown. Twenty-six per cent. of all Muslims surveyed were variolated, the youngest being an 11 year old. The practice appeared to have died out completely by 1970 and most dhanis reported that a fakir had not come for eight to 10 years.

Of those with variolation scars 18% had facial pock marks. Interestingly, they were of a mild form and there were rarely more than 30 in number.

Vaccination status (Table 3)

A scar survey was done in selected PHCs of Jaisalmer and Bikaner where 59% of those interviewed were found unprotected.

Smallpox facial scars (Table 4)

The youngest child in the survey with facial pock marks was a 12 year old. The highest incidence of facial pock marks was found in the age-group 30-39 years. Only 17% of those over 50 years were scarred.

Assessment of the special desert search

The special desert search (13-23 December 1976) covered 423 villages with associated "dhanis"; 413 (98%) were reported searched. Assessment was carried out in 56 villages. In 600 households, 53% saw the searcher, 55% knew of the reward, and 39% knew where to report a case (Table 5). The lowest assessment figures occurred in the PHCs of Jaisalmer.

Discussion

This survey showed that variolation was practised in the desert areas of Rajasthan and appeared to be confined to the rural Muslim community. The highest incidence of variolation was found in PHCs either adjacent to the Pakistan border, or with a large Muslim population. The practice was unknown in the Hindu community.

A major concern was that stored scabs could act as a source of reinfection. This study showed that in Rajasthan scabs were not commonly transported from place to place. The fakir's wife said "there was no need to keep the scabs, there was plenty of infection".

The villagers said that variolation had been discontinued with the start of the government programme. Realistically, however, there were probably several factors that brought variolation to an end. One, the incidence of smallpox was decreasing rapidly in the desert, helped by the low population density. By 1970 smallpox was approaching zero incidence in this area. As a result, there was no need for the fakir. Secondly, the government vaccinator probably exerted pressure on the fakirs to stop the practice. Lastly, after the 1971 Indo-Pakistan War, most of the fakirs appeared to have left for Pakistan.

The vaccination status of the selected population was low. This can be explained by the remoteness of the area. It could only be approached on foot, by camel, or with great difficulty by jeep. Conditions were particularly difficult in Jaisalmer, and many people denied ever having seen a vaccinator.

Certainly smallpox has not been a problem in these areas for many years. This is supported by the fact that no child under 12 years was seen with facial scars in the study. The assessment of the special desert search was satisfactory. Only Jaisalmer had a poor assessment where figures were less than 50%. This was due to the nomadic lifestyle and varying composition of the household.

Conclusion

Variolation was practised amongst the rural Muslim community in the desert areas of Rajasthan but was discontinued by 1970. The health interview provided an excellent means of gathering information on variolation, vaccination and smallpox transmission.

REFERENCE

1. Fenner, F., The eradication of smallpox, WHO publication.

FIG. 1. DISTRICTS SELECTED FOR SPECIAL DESERT SEARCH

FIG. 2. PHCs SELECTED FOR SPECIAL DESERT SEARCH

RAJASTHAN
(PHCs)

LEGEND

STATE BOUNDARY

DISTRICT BOUNDARY

P.H.Cs BOUNDARY

TABLE 1. AGE-SEX DISTRIBUTION OF SAMPLED PERSONS

Age-group	Males	Females	Total
0-4	9	4	13
5-9	12	8	20
10-14	10	6	16
15-19	9	12	21
20-29	14	26	40
30-39	27	17	44
40-49	20	20	40
50+	38	21	59
Total	139	114	253

TABLE 2. VARIOLATION IN SELECTED SAMPLE

Age-groups	No. of Muslims	Variolation scar seen		Those with variolation and facial scars	
		No.	(%)	No.	(%)
0-4	12	-	-	-	-
5-9	16	-	-	-	-
10-14	11	5	(45)	-	-
15-19	16	5	(31)	-	-
20-29	22	5	(23)	3	(60)
30-39	24	7	(29)	2	(29)
40-49	20	7	(35)	2	(29)
50+	31	10	(32)	-	-
Total	152	39	(26)	7	(18)

TABLE 3. VACCINATION STATUS OF SELECTED PERSONS

Age-group	Primary vaccination	Unprotected	
	No.	No.	(%)
0-4	12	7	(58)
5-9	19	9	(47)
10-14	13	6	(46)
15-19	15	6	(40)
20-29	25	12	(48)
30-39	32	26	(81)
40-49	24	14	(58)
50+	24	16	(66)
Total	164	96	(59)

TABLE 4. AGE DISTRIBUTION OF PERSONS WITH FACIAL SCARS

Age-groups	Total surveyed	Facial scars seen	
		No.	(%)
0-4	13	-	-
5-9	20	-	-
10-14	16	3	(19)
15-19	21	2	(9)
20-29	40	10	(25)
30-39	44	17	(39)
40-49	40	10	(25)
50+	59	10	(17)
Total	253	52	(21)

TABLE 5. ASSESSMENT OF DESERT SEARCH

Districts	Household questions	Saw searcher	Knew reward	Report
Barmer	389	243	253	168
Bikaner	42	29	27	23
Jaisalmer	169	45	50	41
Total	600	317 (53%)	330 (55%)	232 (39%)

TABLE 6. DISTRICT-WISE SMALLPOX CASES/DEATHS, 1967-1974

Districts	1967		1968		1969		1970		1971		1972		1973	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Barmer	1	-	31	10	5	1	20	1	-	-	244	39	222	22
Bikaner	97	9	62	4	17	4	43	3	14	2	-	-	-	-
Jaisalmer	-	-	-	-	-	-	20	1	72	3	11	-	-	-

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