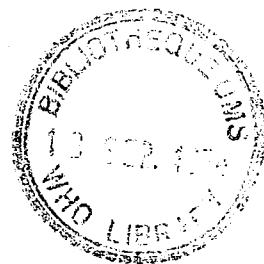




VIRUS CONTENT OF SMALLPOX SCABS*
ON DIFFERENT DAYS OF ILLNESS

by

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Two principal ways of spreading smallpox are through droplets and through scabs, although excretion of virus in the urine, and conjunctival secretion has also been recently demonstrated (Sarkar et al., 1973), where the quantum of virus excreted in the throat of smallpox patients was estimated daily. The present work deals with the quantitative estimation of virus present in scabs on different days. This does not appear to have been done previously.

Materials and methods

Scabs of smallpox patients admitted in the I. D. Hospital, Calcutta, were collected daily or on alternate days with the help of forceps and placed in labelled sterile screw-capped containers. The clinical types and the vaccination status of the patients were noted. The presence of a vaccination scar was taken as evidence of primary vaccination. No attempt was made to obtain the date of primary vaccination or a history of revaccination as it was thought that the information would be unreliable. Day one of illness was termed the day of onset of fever. Scabs were preserved at -20°C until the time of virus estimation. Virus titre was determined by pock count method in chick chorio-alantoic membrane as was done previously (Sarkar & Mitra, 1967). Before inoculation in eggs three scabs were accurately weighed and a suspension of 0.1 g per ml was made with McIlvaine's buffer.

Results

Five patients, three confluent and two discrete, were studied. The details of the cases and the log titre of virus per 0.1 g of the scabs on different days of the disease are shown in Table 1. The separation of scabs was completed on different days in different patients and therefore, the last day of collection of scabs was not uniform in all the cases. The log titre of virus per 0.1 g of scab varied from 3.78 to 6.90.

Discussion

As spread of infection through scabs is well recognized and as viability of variola virus is prolonged when in the dried state as in the scabs (MacCallum & McDonald, 1957), it is important to know the quantum of virus present in the scabs. From the table it is apparent that the virus titre does not depend on the clinical severity or mildness of the case, there being little difference in the titre of virus in the scabs of discrete and confluent cases.

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The previous vaccination status of the patients does not seem to influence the virus concentration in the scabs. Although there was a difference in the quantum of virus excreted in the urine, throat and conjunctiva of haemorrhagic, confluent and discrete cases, the vaccination status of the patients did not make any difference in the virus excretion (Sarkar et al., 1973).

In general, micro-organisms in the excreta in any disease diminish in number as convalescence progresses. This was also found for the urine, throat and conjunctival secretions of smallpox patients (Sarkar et al., 1973). In the scabs, the quantum of virus was not found to have been affected by the passage of time. This is not unexpected, because scabs are nothing but dried-up pustules which were really transformed vesicles, and therefore contain all the entangled virus particles.

Although the separation time of scabs varied from case to case, there was little diminution in the number of virus particles, as variola virus is fairly stable in the dried state. In other words, the infectivity of scabs does not depend on the time when they separate from the smallpox lesions.

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TABLE 1. LOG TITRE OF VIRUS IN THE SCABS
DAY OF ILLNESS WITH VIRUS TITRE/O.1 G (OR PER ML)

Patient	Clinical type	Vaccination scar	13	14	15	16	17	18	19	20	21	22	23	24	25
1	Confluent 26 years male	+	5.53	6.45	6.40	5.78	(No growth)	No scab available							
2	Confluent 10 years male	+			6.54	-	6.45	5.08	-	-	4.48	No scab available			
3	Discrete 18 years male	-				5.60	5.20	5.51	-	5.50	-	5.52	5.26	5.48	No scab available
4	Discrete 25 years male	-	5.30	5.30	-	-	5.70	6.20	-	5.90	No scab available				
5	Confluent 11 years male	-		3.74	-	5.58	-	-	4.60	4.74	-	3.72	No scab available		