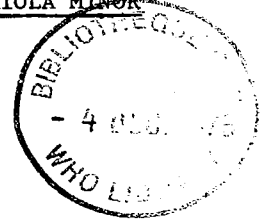




RESIDUAL SKIN CHANGES IN PATIENTS WHO HAVE RECOVERED FROM VARIOLA MINOR

BY

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1. Introduction

Facial pockmark surveys have proved a useful method for assessing the past occurrence of smallpox in countries of Asia and west and central Africa. Controlled studies in India⁽¹⁾ showed that about 75% of patients known to have recovered from smallpox had five or more facial pockmarks when examined one to two years later; such scars usually persist for life.

Although extensive pock lesions often occur in variola minor, ulceration is usually shallow and it is widely believed that persistent pockmarks are rare. However, controlled studies in patients with known histories of recovery from variola minor have not previously been carried out. The intensive surveillance programme conducted in Somalia in 1977/1978 provided an opportunity for such a study.

2. Materials and Methods

A follow-up study was made in May - August 1978 of 175 patients from five heavily affected regions of Somalia who had suffered from variola minor a year (11 to 13 months) earlier. Patients were selected from outbreaks in which the diagnosis had been confirmed by laboratory investigation, and from social groups and localities that were accessible for the follow-up.

Individual subjects were identified, demographic and epidemiological data checked, and examinations made of the face, arms and hands, legs and feet, and other visible parts of the body. Facial pockmarks or residual scars elsewhere on the body were counted, and vaccination scar(s) and corneal opacities (impaired vision, blindness) recorded. As it was soon apparent that only a few cases had typical facial pockmarks, any residual 'spots' of discolouration were also recorded, i.e. hyperpigmented or hypopigmented concentric spots three or more mm in diameter without depression, both on the face and on other visible parts of the patients' bodies. Only readily visible discoloured spots were recorded.

Challenge vaccination was carried out on 92 subjects at the time of the examination for facial pockmarks.

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3. Results

The sex, age and vaccination status of the subjects examined are shown in Table 1.

TABLE 1 SEX, AGE, DISTRIBUTION AND VACCINATION STATUS OF SUBJECTS EXAMINED

| Age Groups | Number Examined | MALES | | FEMALES | |
|------------|-----------------|------------------|--------|------------------|--------|
| | | Vaccination Scar | | Vaccination Scar | |
| | | Present* | Absent | Present* | Absent |
| 0 - 4 | 28 | 7 | 12 | 3 | 6 |
| 5 - 9 | 37 | 4 | 13 | 2 | 18 |
| 10 - 14 | 28 | 4 | 10 | 5 | 9 |
| 15 - 19 | 22 | 7 | 6 | 3 | 6 |
| 20 - 29 | 23 | 5 | 4 | 4 | 10 |
| 30 - 39 | 15 | 2 | 6 | 1 | 6 |
| 40 + | 22 | 3 | 5 | 2 | 12 |
| TOTAL | 175 | 32 | 56 | 20 | 67 |

* All subjects with a vaccination scar had been vaccinated during attack or incubation period.

3.1 Facial Skin Changes

The results of the facial examinations are shown in Table 2 and also observations recorded on the occurrence of easily visible hyper- or hypo-pigmented spots, without scarring.

TABLE 2 FACIAL SKIN CHANGES DUE TO VARIOLA MINOR

| | | No Significant Changes | Pockmarks | | Discoloured Spots | | |
|---------|----------|------------------------|-------------|------------|-------------------|------------|-----------|
| | | | 1 - 4 | 5 or more | 1 - 9 | 10 or more | |
| Males | No. % | 88 (100) | 53 60.3 | 14 15.9 | 8 9.1 | 4 4.5 | 9 10.2 |
| Females | No. % | 87 (100) | 57 65.5 | 15 17.2 | 4 4.6 | 4 4.6 | 7 8.0 |
| Total | No. % | 175 (100) | 110 62.8 | 29 16.6 | 12 6.8 | 8 4.6 | 16 9.1 |

Only eight males and four females out of the 175 subjects (6.8%) had facial pockmarks that would be acceptable on current criteria (five or more depressed circular scars) as evidence of past smallpox. Some others (14 males and 15 females) had between one and four facial pockmarks, and twenty-four other subjects had clearly visible spots of skin discolouration that were probably due to variola minor. Less clearly discernible discoloured spots were present on another thirty-eight subjects, but this would almost certainly have been overlooked in a routine examination.

There were no significant sex differences in the occurrence of facial lesions, nor any differences associated with the presence or absence of a vaccination scar (in these individuals, vaccination scars were the result of vaccination during the incubation period or clinical illness due to variola minor). Although the numbers were small, the highest proportion of individuals without facial skin changes was found in the youngest age group (0 - 4 years); thereafter there was no significant age difference.

3.2 Skin Changes Elsewhere on Visible Parts of Body

In only one individual was a single pockmark found elsewhere on the easily visible parts of the body, but one third of all subjects (58) had easily visible areas of discoloured skin. Sixteen of these subjects either did not have, or had only minor, facial skin changes; the other forty-two had pockmarks or easily visible skin discolouration.

3.3 Challenge Vaccination

At the time of the skin examination ninety-two of the 175 subjects were challenge vaccinated. Vaccination was carried out on the basis of availability and consent. Sixty-five of these subjects were available for checking 5 - 7 days later. The results are shown in Table 3. Fourteen were negative and fifty-one positive; most (41) of the latter having a characteristic 'major' reaction, i.e. a central lesion 5 mm or more in diameter with a larger area of surrounding induration. There were no significant sex or age differences. Accelerated reactions were uncommon, and most of these occurred in individuals who had been vaccinated at the time of their illness a year earlier (see Table 1).

TABLE 3. CHALLENGE VACCINATION A YEAR AFTER VARIOLA MINOR

| Sex | Number Examined | Negative reaction | | Positive reaction | | | |
|---------|-----------------|-------------------|---------|-------------------|---------|-------------|---------|
| | | Number | Percent | Major | | Accelerated | |
| | | | | Number | Percent | Number | Percent |
| Males | 32 | 8 | 25.0 | 20 | 62.5 | 4 | 12.5 |
| Females | 33 | 6 | 18.2 | 21 | 63.6 | 6 | 18.2 |
| TOTAL | 65 | 14 | 21.5 | 41 | 63.1 | 10 | 15.4 |

4. Discussion

These results confirm the impression widely held among smallpox workers that, unlike variola major, variola minor rarely causes permanent facial scarring (7% with five or more pockmarks, compared with 75% after recovery from variola major). This correlates with the differences in the nature of the lesions in the two forms of this disease. In variola minor the lesions are usually more superficial and evolve and heal more rapidly than in variola major. Scarring is probably found only if secondary infection (usually with Staphylococcus aureus) has occurred.

Another change in the skin was observed in a number of patients who had recovered from variola minor a year earlier, namely circular areas of hyper- or hypo-pigmentation. However, it is doubtful whether such changes could be used in surveys to assess whether or not variola minor had occurred previously.

The observation that 78% of subjects who had recovered from variola minor a year earlier reacted positively to revaccination (63% with a 'major' reaction) contrasts sharply with findings in variola major, where only 13% of those tested one year after the attack had a major vaccination reaction(2).

5. Summary

In order to assess the occurrence of facial pockmarks after recovery from variola minor, 175 subjects who had recovered from variola minor from five localities in Somalia were carefully re-examined a year later. Only 7% had five or more facial pockmarks (the usual criteria for 'positive' classification in facial pockmark surveys). Thus, pockmark surveys cannot be considered to be an effective method for evaluating the past smallpox situation in areas where only variola minor had been prevalent. A number of others had discoloured spots of skin on their faces or bodies, but these are of dubious value for survey purposes.

Challenge vaccination gave a high proportion of positive results, suggesting that this procedure would be of limited value for confirming the diagnosis in patients recently recovered from variola minor.

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