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MEASURES TO BE TAKEN IN CASE OF OUTBREAKS IN COUNTRIES FREE FROM SMALLPOX

by

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Apart from adequate hospital treatment to be provided for all smallpox cases, the measures to be taken must pursue to the elimination of (potential) sources of infection and to afford the highest attainable degree of individual protection to all persons exposed to infection.

The proper instant for these measures is not, however, the moment an outbreak is recognized, viz. when second or later generations occur, but earlier, when smallpox is suspected in a person recently arrived from a smallpox-infected area.

It appears from practical experience that here lies a main point of trouble, as often the disease is not suspected at the earliest possible moment. This holds especially for the diagnosis of an imported case or, more generally, before the presence of smallpox is recognized and information is given to the medical profession and the public. But also when the presence of smallpox is known, cases may be misjudged. This holds especially for the fulminating type (Dixon type 1) and the benign types (Dixon types 7, 8 and 9). Leukaemia and chicken-pox are not uncommon as false diagnoses.

One of the duties of the health authority in case of an outbreak (including the situation that variola is only recognized in an imported case) is to give incentives for correct diagnosis. The co-operation of clinical consultants and diagnostic laboratories serves also a second purpose, viz. to keep the medical officer of health in charge of smallpox control informed about the occurrence of suspected and certain cases. Information to the medical profession should never be restricted to practitioners but must also include the hospitals in the area.

Elimination of sources of infection concerns the smallpox patient as well as his environment (clothing, bedding, etc.). Isolation and disinfection are the proper measures to be taken.

As guaranty for timely isolation, that means isolation on the first day of illness, a system of surveillance of contacts is a necessity. The way to put this surveillance into effect cannot be described in simple terms as the measures to be taken will depend on personal and local circumstances. The type of contact with a source of infection and the immune status of the individual concerned will be of decisive importance in this connexion. It could be argued that isolation is the best method of realizing surveillance but, apart from eventual legal objections, this is not justifiable in case of co-operative individuals. In any case, surveillance should consist of a daily report on the condition of the contact and during the last phase of the presumed period of incubation the person under surveillance must be seen daily by a doctor.

Although surveillance is not meant to be an euphemism for isolation, a minimalization of social contacts is strongly advisable, especially as long as there is no evidence that the immune status of the person under surveillance is satisfactory. Isolation of people charged with daily routine medical, nursing and other care for smallpox patients is recommendable and will be generally acceptable for the persons concerned.

At this moment, the impact of the findings of Kempe et al. (1961) on the value of vaccinia hyperimmune gamma-globulin in the prophylaxis of smallpox and still more the data given by Bauer et al. (1963) on prophylactic treatment with N-methylisatin β-thiosemicarbazone (compound 33T57, Marboran) are hard to evaluate as regards their future significance as means of control of a smallpox outbreak, in addition to, or as a substitute for vaccination. As for hyperimmune gamma-globulin, used in a dosage of 5-10 ml of a 12 per cent. solution, availability will be a limiting factor in application. The prophylactic use of an effective drug, mentioned above, probably has a brighter future.

It is of utmost importance that a scheme of priority is followed in the organization of vaccination and revaccination. The classification of contacts, given by Dixon (1962) seems appropriate:

Class 1 - "Inner ring" contacts. Members of the same household, persons working in close proximity during the early stages of illness, neighbours and visitors having actual contact with the patient, the patient's room or patient's clothing or bedding.

Class 2 - "Outer ring" contacts. Visitors and neighbours who entered the house but have no known contact with the sick person or his immediate environment. Persons at the same workplace but not in close proximity with the patient.

Class 3 - Remote or doubtful contacts, including persons who live or work in the same locality but definitely have no contact with the infected home or inmates.

It should be stressed that persons caring for smallpox patients in hospitals - including charwomen, hairdressers etc. as well as personnel of laboratories for pathology and virology, mortuary attendants and ambulance personnel - belong to Class 1. Under actual circumstances, it does not seem probable that their vaccination status will be completely satisfactory at the moment a patient is admitted, or a case is recognized as smallpox after admittance. Vaccination and revaccination are equally urgent for personnel of other hospitals in the area, as smallpox patients may be admitted there by inadvertence.

The description of "Class 3 contact" can be made valid, after a bit of consistent reasoning, to the whole population of the country and even of neighbouring countries. Limitation of this class to persons "in the same locality" is not simply defensible in the light of intense traffic communications existing in many countries where smallpox is non-endemic. On the other hand, serious objections can be made against large-scale vaccination, in so far as these may turn the main interest away from the Class 1 and 2 contacts. Furthermore, the risks inherent especially to primary vaccinations should be kept in mind.

For vaccinations in case of an outbreak, vaccines of high potency should be available and the results must be checked. Vaccination with multiple insertions is highly advisable.

As regards the subject of disinfection, the summary of the methods principally used as stated by Dixon (1962) is given in the Annex.

REFERENCES

Bauer, D. J. et al. (1963) Lancet, 2, 494

Dixon, C. W. (1962) Smallpox, J. & A. Churchill Ltd, London

Kempe, C. H. et al. (1961) Bull. Wld Hlth Org. 25, 41

ANNEX

Rooms

Method A - Vacuum cleaning, burn the dust, wash floors with soap and water, leave open to air and sunlight 48 hours. Steam disinfection of bedding, curtains, and other removable fabrics.

Method B - Remove fabrics for steam disinfection, etc., followed by formalin disinfection.

Hospital wards

Vacuum cleaning, wash down walls, formalin disinfection, air and sunlight 48 hours, reoccupy. Repainting has a valuable psychological effect on further occupants.

Ships

Vacuum clean, wash, repaint. (Inside of ventilation system is normally ignored).

Ambulances

Spray. (a) Use of a spray consisting of 2-1/2 lb carbolic soap, 1-1/2 lb white cyllin and 2-1/2 gallons of water, or (b) by formalin solution, using 2 ounces of formalin to 1 gallon of water. The ambulance is left sealed for one hour then opened up.

Bedding

(a) If stained, soak in cold water, steam disinfect. (b) Soak in 5 per cent. lysol 24 hours, launder.

Blankets

Steam disinfect.

Leather objects and books

Formalin vapour for six hours. Three would probably suffice. Penetration will not occur in closed books, but if these have not been used by the patient, the danger would appear to be negligible. If in doubt, expose to air and sunlight for 48 hours.

Toys

Boil, or wash with antiseptic solution, or expose to formalin vapour.

Annex

Paper money

Can be exposed to formalin vapour, but easier to iron both sides with electric iron.

Coins

Boil, or treat with antiseptic solution.

Letters

(a) Iron separate pages, both sides. (b) Expose loose pages and envelope to formalin vapour, three hours, then seal.

Radio sets, television sets, cameras, clocks, etc.

Vacuum clean with Dustette. Wipe surfaces with antiseptic solution. Expose to air and sunlight for 48 hours.

Cats and dogs

Wash the fur with soap and water.