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CLINICAL DIAGNOSIS OF SMALLPOX

by

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Physicians are expected to be able to diagnose smallpox readily, particularly if they happen to be classical ordinary cases. By elimination of smallpox in many countries, this ability has been reduced to a great extent. Most of medical doctors who have graduated within the last few years have lost the chance of seeing a case of smallpox during the whole of their medical career. Furthermore, "labelling" a patient presenting some kind of skin rash as "smallpox" involves national and international responsibilities. Immediate action should be taken, and a kind of mechanism should be organized to cope with possible panic among the public. Therefore it is most likely that a patient showing a rash, with no given evidence to rule out suspicion of smallpox, is labelled as a case of measles, drug allergy, skin disease or most commonly still, chickenpox.

Many smallpox outbreaks have resulted from this unintentional but too frequent error of diagnosis. The effects have been large and lasting epider accounting for loss of many a human life, which could have been spared by prompt and early diagnosis of the disease.

The problem of diagnosis of smallpox is not only faced by a field epidemiologist or qualified hospital physician , or by a private clinician. It takes its real importance when it is posed to low-level auxiliary health workers in charge of preventive and curative health matters, responsible for the welfare of a large population in far-away areas in the interior of countries; this still exists in quite a number of countries of this Region where health workers have no easy access to literature and where medical supervision is nearly inexistant thus making the possibility of communicating and consulting with experienced physicians, nil.

For these, diagnosis of smallpox, when and where indicated, represents a most serious problem and responsibility.

Today, with the global smallpox eradication programme in mind, it is not really so important to discuss and distinguish between the various forms of the disease, whether haemorrhagic, flat, ordinary, modified, etc. but what really matters is that one could be able to suspect and recognize smallpox and report it for further epidemiological investigations.

You are about to see a series of slides prepared by WHO on African subjects. These are to be used as a visual medium to help teaching the medical profession, doctors, auxiliaries, smallpox eradication staff and especially those engaged in surveillance activities, as well as students in medical, nursing and dressers' schools, to get more familiar with the diagnosis of smallpox, and to learn particularly how to differentiate between smallpox and chickenpox, a disease for which smallpox is only too often mistaken.

These slides may still not be ideal, but they certainly will help a lot in making our health workers "smallpox-conscious".

Slide No.1: The diagnosis and reporting of cases of smallpox are essential for an effective eradication programme.

Slide No.2: This series of slides has been prepared to assist health workers in recognizing smallpox. The characteristic features of typical cases are contrasted with those of chickpox - the disease with which smallpox is most commonly confused.

Smallpox is caused by variola virus. The disease is spread by secretions from the patient's mouth and nose and by material from pocks or scabs. Close contact with the patient or his clothing or bedding is thus required for infection.

Slide No.3: After a person has been infected, there is a period during which he has no symptoms. This, the incubation period, is usually 12 days in length but may be as short as 7 days or as long as 17 days. The illness begins with fever. The patient feels sick and has symptoms such as headache and backache. A rash appears after 2 to 4 days.

Slide No.4: The rash is first observed on the face, upper body, and arms but within a day or two also appears on the lower body and legs. Characteristically the rash is most dense on the face, the arms and hands, and the legs and feet. The body usually has fewer pocks than the extremities.

Slide No.5: The rash progresses through characteristic stages. On the first day of the rash small dark spots appear which, during the next one or two days, become raised above the skin surface. These pocks are called papules. Fluid gradually accumulates in the papules, forming vesicles. The fluid in the vesicles then becomes cloudy and looks like pus. This pustular stage lasts

for a varying period, usually between 7 and 10 days. Gradually the pustules dry up and dark scabs form, which take 1 to 2 weeks to fall off.

The first group of slides shows pictures of patients with smallpox at different stages of the rash.

Slide No.6: The first pictures are of patients in the papular stage of the rash.

Slide No.7: This shows the face of a 3-month-old boy on the 2nd day of the rash. The face is covered with papules. At this stage it is sometimes difficult to distinguish the rash of smallpox from that of chickenpox or measles.

Slide No.8: The same kind of rash is present on other parts of the body as well. The thigh is shown here.

Slide No.9: In this slide of a young woman, taken on the 3rd day of the rash, fluid has begun to accumulate in several of the papules.

Slide No.10: In this picture, the sole of the foot is seen at the same stage. Many papules are present.

Slide No.11: The rash of this infant has developed somewhat further. It is apparent that fluid is now present in the pocks and the pocks are distinctly raised above the skin surface. This is the vesicular stage.

Slide No.12: The pocks at this stage are seen in a close-up view. Note that all the pocks are at the same stage of development.

Slide No.13: In this slide, it is apparent that even more fluid has formed in the pocks. However, the fluid has not yet become cloudy.

Slide No.14: The next group of slides follows the development of the rash

in the same child from the early pustular stage, as shown by the arrow, until recovery.

Slide No.15: On the 4th day, pustules are present over the entire face, including the lips. The fluid in the pocks is cloudy.

Slide No.16: In this close-up picture of the upper part of the face, the pocks are seen in greater detail. A few have been rubbed off from the cheeks and nose.

Slide No.17: This picture of the lower part of the face shows lesions on the tongue and lips. Other lesions may be present inside the mouth. This is the time in the illness at which the patient is most infectious.

Slide No.18: A smaller number of pocks of a similar type are seen on the upper arm and chest. Note again that the pocks all resemble each other in appearance.

Slide No.19: In this close-up view of the rash on the thigh, the pocks differ somewhat in size but are all in the pustular stage. They are round, firm when felt, and deeply embedded in the skin.

Slide No.20: Pictures taken two days later, on the 6th day of the rash, show that the appearance of the pocks has changed. The fluid has begun to dry up and some of the pocks have been broken and rubbed off. This occurs particularly on the face.

Slide No.21: Here is a picture of the arm taken at the same time. In this area, all the pocks are still intact.

Slide No.22: Pocks are also seen on the palm of the hand. This is usually observed in smallpox but rarely in chickenpox.

Slide No.23: A close-up of the same area on the thigh as was seen before, showing that some of the pocks are drying up and beginning to shrink.

Slide No.24: By the 9th day of the rash, scabs have begun to form and more have been removed by rubbing.

Slide No.25: On the body, however, the scabs are less developed and some pustular fluid can still be observed in the pocks.

Slide No.26: A day later, a close-up view of the same area of the thigh as was seen before shows a few shrunken pustules, scabs, and a few light-coloured areas from which the scabs have already separated.

Slide No.27: The scabs gradually come off. This occurs first on the face and upper part of the body, last of all on the palms of the hands and soles of the feet. In this child, two weeks after the beginning of the rash, the scabs on the face and upper part of the body have almost all come off.

Slide No.28: This is more clearly seen in a close-up view.

Slide No.29: Three weeks after the beginning of the rash, patients have this characteristic appearance.

Slide No.30: The child on the right still has some scabs on his feet. Over a period of many weeks the skin will gradually return to its normal appearance, although scars may form, particularly on the face, and last for life.

Slide No.31: It will be recalled that one of the most important points in differentiating smallpox from other diseases with a rash, especially chickenpox, is the distribution of the pocks. The pocks are most numerous on the face, arms, and legs, less numerous on the body.

Slide No.32: This is demonstrated in this front view of a young child, taken on the 7th day of the rash.

Slide No.33: A back view shows a similar distribution of the rash. When the pocks are very numerous or very few in number, the characteristic distribution may not be observed.

Slide No.34: Although this boy has an extensive rash, the pocks are more heavily concentrated on the face and arms than on the body.

Slide No.35: Another useful point in differentiating smallpox from chickenpox is the presence of pocks on the palms and soles. In smallpox patients, pocks are frequently observed on the palms.

Slide No.36: The soles of the feet also frequently show pocks. In this picture there are only a few, but they may be very numerous.

Slide No.37: The scabs separate from the pocks on the palms of the hands considerably later than they do from the pocks on the legs and arms. Here, dark brown scabs are still present on the palm but they have all separated from the lesions on the leg.

Slide No.38: The scabs separate last from the soles of the feet, where they remain for many days after all the other scabs have come off.

Slide No.39: The disease most frequently confused with smallpox is chickenpox. In most patients the diseases are quite different, but in a few patients the diagnosis can only be made by laboratory tests. In chickenpox the fever usually begins at the same time as the rash or only a few hours before, in smallpox the patient is usually sick for 2 to 4 days before the rash appears. The smallpox rash, as we have seen, develops comparatively slowly through a series of stages, and at any one time all the pocks on a particular area of the body look very similar.

In chickenpox new lesions continue to appear over a period of several days to a week and develop much more rapidly. Consequently, several stages of the rash can be seen at the same time on any part of the body.

Slide No.40: This patient with chickenpox started developing a rash 3 days before this picture was taken. From the appearance of the rash on his face, it is difficult to be sure about the diagnosis.

Slide No.41: However, a close-up view of the shoulder shows pocks in different stages. Papules, small vesicles, and one or two pustules, some with scabs forming on them, are present. This is the 3rd day of the rash.

Slide No.42: By the 5th day, it can be observed on the face that many of the pocks have scabs. Papules and vesicles can be seen and, although not clearly visible, a few pustules are present on the forehead.

Slide No.43: By the 7th day, only scabs are present and several have already come off. It will be recalled that smallpox patients at this time, however, will still be in the pustular stage of the rash.

Slide No.44: The pustular stage is seen in this picture of a child with smallpox, one week after the onset of the rash.

Slide No.45: There are two other characteristics of the chickenpox rash that are helpful in diagnosis. The lesions are more numerous on the body than on the arms and legs, whereas the reverse is true in smallpox. There are few or no lesions on the palms and soles, whereas they are usually present in smallpox.

Slide No.46: In this patient, many pocks are present on the back but only a few on the arms

Slide No.47: The forearm shows only a few pocks, and there are only two pocks on the palm.

Slide No.48: Note the contrast in this patient with smallpox.

Slide No.49: In chickenpox, the lower legs are also relatively free of pocks.

Slide No.50: After chickenpox scabs have come off, pinkish areas on the skin may be seen like those after smallpox. This patient has already lost most of the scabs by the 8th day of the rash.

Slide No.51: Note again the particular points that help to differentiate chickenpox from smallpox. In smallpox, the fever precedes the rash by 2 to 4 days. The pocks on the body are at the same stage at any one time and they develop comparatively slowly. The pocks are more numerous on the arms and legs than on the body and are usually present on the palms and soles.

In most areas of Africa, 1 person out of every 10 who acquire smallpox will die. In chickenpox, death is very uncommon. When death occurs in a patient in whom chickenpox has been diagnosed, smallpox should always be suspected

If there is any doubt whether a patient has chickenpox or smallpox, he should always be considered to have smallpox. The health authority should be notified immediately and the patient should be isolated either at home or in hospital. All his contacts should be vaccinated.