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Original Articles.

SOME CLINICAL OBSERVATIONS ON CHICKEN-POX.*

JAY F. SCHAMBERG, A.B., M.D.

Professor of Dermatology and Infectious Eruptive Diseases in the
Philadelphia Polyclinic and College for Graduates in
Medicine; Assistant Physician to the Municipal
Hospital for Infectious Diseases.

PHILADELPHIA.

The purpose of this brief paper is to record a number of observations in connection with varicella. This disease is not of great importance in itself, but it acquires a special prominence through its possible confusion with smallpox. The differential diagnosis of these two affections, based on a study of many cases observed during a recent variolous epidemic, is given at some length. In the presentation of the accompanying data no pretense is made at logical sequence.

At the present day it would appear an act of supererogation to devote any time to proving the non-identity of chicken-pox and smallpox. And yet only a quarter of a century ago the relation of these two diseases was the subject of acrimonious controversy. The great Viennese dermatologist, Hebra, a man of large experience in eruptive fevers, loudly proclaimed the unity of these two diseases.

Remarkable as it may seem, Hebra's views are still taught in Vienna at the present day. Kaposi, one of the foremost dermatologists of the world and a clinician skilled in the diagnosis of smallpox, tenaciously adhered to Hebra's views up to the time of his death, less than a year ago.

Kassowitz and Hochsinger are still ardent advocates of the identity of variola and varicella. In Kaposi's last treatise he wrote:

The arguments advanced by Thomas, Steiner, Monti, Henoch, etc., have been opposed by Hebra, Kassowitz and myself with arguments which appear to me sufficiently strong to deny the existence of a varicella distinct from variola. I recognize only a single form of variola, derived from a single virus, which may occur with more or less severe, even fatal symptoms, and at other times runs its course as an insignificant disease.

It is entirely unnecessary at the present day to formulate answers to this and similar statements. It may be of interest, however, in connection with this subject, to make mention of an epidemic of chicken-pox occurring in children who were convalescent from smallpox.

In November, 1900, a child suffering from chicken-pox was sent into the Municipal Hospital of Philadelphia, under the erroneous diagnosis of smallpox. The

true character of the disease was recognized and the child vaccinated. This patient did not contract smallpox, but succeeded in transmitting varicella to a number of other children in the ward. These, in turn, infected new patients as they arrived, and in this manner varicella remained in the children's ward for a period of three months. In all, thirty-three children suffering from smallpox were attacked. The attacks were, in the main, mild and the accompanying eruption moderate in extent. Inasmuch as the patients were exposed during the eruptive period of smallpox, the chicken-pox eruption did not appear until after the variolous lesions had become crusted or were disappearing. The earliest onset of the varicella was in a girl of 7 years, who developed chicken-pox on the seventeenth day of the variolous outbreak. In this patient the firm, compact, crusted lesions of smallpox appeared in strange contrast with the recent dewdrop-like vesicles of chicken-pox. The patient's temperature had not yet reached normal, but was hovering about 100 F. at the time of the appearance of the chicken-pox eruption. It then rose to 102 F., subsiding rapidly to 100 F., and, in a few days, again rising to 103 F., owing to the development of an abscess. In this child the two diseases may be said to have existed simultaneously.

The chicken-pox efflorescence appeared in most of the patients from the twentieth to the thirty-fifth days of their smallpox eruption. As the majority of these children entered the hospital on the third or fourth day of the variolous eruption, it is seen that many of the patients did not contract chicken-pox for about a month after they were exposed. Inasmuch as the period of incubation of varicella is about fourteen to eighteen days, seldom longer than three weeks, this observation would suggest that during the early eruptive period of smallpox many of the children were not susceptible to the infection of chicken-pox.

COINCIDENT SMALLPOX AND CHICKEN-POX.

More recently we have had at the Municipal Hospital a child showing at the same time the eruptions of chicken-pox and smallpox. The history of the case is of interest.

S. F., a girl, 5 years of age, developed an eruptive disease which was regarded by a physician as suspicious; thereon, two other physicians independently visited the patient and pronounced the disease to be chicken-pox. The lesions dried up in the usual time, but two weeks later the girl became ill and developed typical smallpox. It is undesirable to publish the circumstances, but the fact is established that the variolous infection was carried to the child's home at one of the visits above referred to.

Thirteen days after the above patient was first seen, a smaller sister, aged 2 years, developed the eruption of chicken-pox. Twenty-four hours later the characteristic lesions of

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smallpox appeared on her. It is to be noted that this child was exposed to the smallpox infection at the same time as her sister. On admission to the hospital the little patient was covered with firm variolous papules. The face, arms and legs were profusely involved, the trunk to a lesser extent. On the forehead, near the border of the hair, were two crusted and superficially ulcerated varicella lesions. A half dozen or more lesions were also observed on the back and a few on the abdomen and chest. On the lower portion of the back was a comparatively recent chicken-pox vesicle just beginning to dry. The subsequent course of the case left no doubt as to the variolous nature of the second eruption. Two other children of this family who were protected against smallpox by previous vaccination showed crusted varicellous lesions on different portions of the body.

Chicken-pox may usually be distinguished from smallpox without much difficulty. In exceptional instances, however, the diagnosis may present perplexities which may cause even a physician experienced in these diseases to delay in pronouncing definitely as to the nature of the disease. Errors may occur through regarding a mild smallpox as chicken-pox or looking on a severe varicella as variola. The points of differential importance are as follows:

1. *The Vaccinal Condition of the Patient.*—If a child under 5 or 6 years of age presents an eruption which exhibits features both of chicken-pox and of smallpox,

Fig. 1.—Extremely mild smallpox in an unvaccinated child.

the presence of a typical vaccinal cicatrix would constitute strong presumptive evidence against the variolous nature of the exanthem; for successfully vaccinated children of this age do not acquire smallpox save under extraordinary circumstances. The same evidence would obtain in an adult successfully vaccinated within a similar period of time.

2. *Initial Symptoms.*—The appearance of the smallpox eruption is preceded by two or three days by an illness characterized in its most complete form by chills, fever, headache, backache, vertigo, nausea and vomiting, prostration and general pains. The more severe the oncoming eruption the more pronounced are these symptoms apt to be. The syndrome is often incomplete, the invasive illness presenting but a few of the above mentioned symptoms. In exceptionally mild cases one may not be able at all to elicit a history of a prodromal stage. It is extremely uncommon, however, for this to occur, and the existence of premonitory symptoms should always be regarded as a matter of great differential importance.

Except for occasional malaise a half day or so before the appearance of the chicken-pox eruption there is, in the vast majority of cases, no prodromal stage. We have recently had the opportunity at the Municipal Hospital of studying an outbreak of chicken-pox among con-

valescents from scarlet fever. The continuous temperature records show that in nearly every case the eruption appeared synchronously with or before any pyrexial elevation. In exceptional cases, in adults, chicken-pox may, however, be preceded by a prodromal illness suggestive of, but milder, than that observed in smallpox. These patients seldom experience vomiting or prostration and the febrile elevation is, as a rule, moderate.

3. *Constitutional Symptoms.*—The fever and prostration in the eruptive stage are usually more severe in smallpox than in chicken-pox. This is not an invariable guide, however, as severe cases of varicella are accompanied by higher temperature than very mild cases of smallpox.

4. *Distribution of the Eruption.*—It is a well-known and important fact that the smallpox eruption attacks with predilection the face and distal portions of the extremities. On the trunk, and especially the abdomen, the lesions are nearly always more sparse. In chicken-pox the eruption is usually most profuse on the trunk, particularly the back, and relatively sparse on the wrists, hands, feet and face. In general it may be stated that smallpox prefers the exposed surfaces and chicken-pox the covered.

It has been claimed that chicken-pox does not attack the palmar and plantar surfaces. This statement is erroneous, inasmuch as the palms of the hands and soles of the feet are every now and then attacked in pronounced cases. Of course, one never sees such a profusion of lesions in these regions as is observed in smallpox.

5. *Extent of the Eruption.*—The number of lesions on the skin should not be regarded as important evidence. As an example of a sparse eruption may be mentioned an unvaccinated child, admitted some months ago into the Municipal Hospital, who had but five lesions on the entire cutaneous surface. On the other hand, a lad with chicken-pox occupying a different ward had about 1,400 lesions and another boy about 3,000.

6. *Character of the Lesions.*—In smallpox the eruption begins as firm papules, which slowly increase in size and develop into vesicles and pustules. Not all variolous papules are "shotty," but they are more deeply seated and have a more infiltrated base than the chicken-pox lesions. The variolous vesicles are often harder than the papules. They are moderately uniform in size and are often, although by no means always, umbilicated. The vesicles are multilocular and difficult to rupture with the fingernail.

Chicken-pox lesions may begin as maculo-papules, but within a few hours some become frankly vesicular. The epidermal roof is thin and easily broken, permitting the exit of a clear watery serum. With the collapse of the vesicle the infiltration seems to disappear. The vesicle is usually unilocular; but little diagnostic value, however, should be placed on the comparative degree of evacuation of variolous and varicellous vesicles with a needle.

Chicken-pox lesions vary greatly in size, some being as small as a millet seed and others as large as a fingernail. They do not become umbilicated save secondarily by central caving in or desiccation. The early drying with the production of a depressed blackish crust in the center and irregular puckering of the vesicles or pustule on the periphery is highly characteristic of chicken-pox.

It is not rare in an extensive eruption of varicella to find one or several vesicles which resemble variolous vesicles, and, on the other hand, in smallpox to occasionally see a few superficial vesicles which resemble those of chicken-pox. Again, in varicella in adults it is not rare

to find on the thick skin of the forehead very firm papules, or even nodules.

7. *Manner of Eruption.*—The eruption of smallpox comes out without interruption in the course of twenty-four or forty-eight hours. The lesions show, therefore, a quite uniform development. (It should be remarked, however, that the eruption on the face is always a little in advance of the development elsewhere.) The chicken-pox eruption comes out in crops on successive or alternate days, and the lesions may be seen in varying stages of development. The coexistence of recent tense vesicles,

Fig. 2.—Extensive chicken-pox. Number of lesions estimated to be about 3,000.

older puckered vesico-pustules and dried crusts is highly characteristic of the disease.

8. *Course of the Eruption.*—Smallpox lesions undergo a gradual evolution from papule to crust in the course of 10 to 12 days. (In modified cases 5 to 6 days.) Chicken-pox lesions last from 2 to 4 days and then crust. The crusts of smallpox are dense and compact, while those of chicken-pox are thin and friable. The presence of numerous hard, mahogany-colored crusts imbedded in the horny layer of the palms and soles bespeaks smallpox.

There is no one characteristic symptom on which a differential diagnosis between smallpox and chicken-pox can be based. The case is to be viewed in all its aspects and a diagnosis made from the history and the associated local and constitutional manifestations. A due sense of proportion should be exercised and proper weight accorded to the presence and absence of the various symptoms. Even when this is done there are occasional cases in which twenty-four hours' delay and observation are desirable in order to definitely establish the diagnosis.

CHICKEN-POX IN ADULTS.

It is generally stated that chicken-pox is extremely rare among adults. Thomas, who had a very large experience in eruptive fever, writes (Ziemssen's Encyclopedia of Medicine, page 8): "In children over 10 years of age attacks are infrequent, and I never saw an adult suffering from varicella." Kinsman, who had an extensive experience covering thirty years, and Corlett, who has studied eruptive fever for twenty years, make similar statements. J. Lewis Smith and Flint each saw one case. Jonathan Hutchinson saw one or two cases in patients about 20 years old; he remarks that a "point of great interest in varicella is the almost absolute immunity of adults."

During the past two years about 2,300 patients suffering from smallpox have been treated in the Municipal Hospital. Ten adult patients sent in with the diagnosis of smallpox were found to have chicken-pox. The diagnosis in these cases was confirmed by my senior colleague, Dr. Wm. M. Welch, who during the past thirty-three years has seen over 7,000 cases of smallpox. All of these patients were carefully vaccinated and those not protected by previous vaccination took the vaccine disease.

In addition to these cases I have seen 6 other adult patients with varicella. The ages of these 16 patients are as follows: two were 20 years old, one 21, one 22, one 25, one 26, two 28, one 30, two 32, one 34, two 35, one 38, and one 39. Ten of these patients were males and six females; seven were negroes and nine were whites.

It is thus seen that varicella is not so rare among adults as the experience of the above mentioned careful observers would seem to indicate. The experience in London during the recent extensive smallpox epidemic was much like ours at the Municipal Hospital. Dr. Wanklyn, the smallpox referee and medical superintendent of the ambulance service of the Metropolitan Asylums Board, reports that 200 cases of chicken-pox were sent to the diagnosing station, and that 16.7 per cent., or 33, of these were persons over 18 years of age.

INCUBATION PERIOD OF CHICKEN-POX.

The incubation period of chicken-pox is stated by Trousseau, Gee, Thomas, Körber, Hesse and others to be about 13 to 17 days. It is recognized, however, that much wider variations may occur. In a recent epidemic in the Municipal Hospital it was found possible to determine the incubation stage in sixteen cases. The periods were as follows: 13 days in 1 case; 14 in 7 cases; 15 in 3 cases; 17 in 2 cases; 18 in 1 case; 19 in 1 case, and 21 days in 1 case.

The period of incubation of varicella is thus seen to be both longer and more variable than that of smallpox. The vast majority of patients who are breeding variola fall sick from the tenth to twelfth day after exposure.

A recent experience in a physician's family would seem to indicate that varicella may be transmitted before the appearance of the exanthem.

A girl of 16 years developed slight sore throat and a little fever, and was carefully isolated in an upper portion of the house. A small whitish patch on the posterior pharyngeal wall was noticed. On the following day the eruption of chicken-pox appeared. A brother, 8 years of age, was kept in a distant part of the house and there was no inter-communication whatsoever. Sixteen days after exposure, that is, exposure to the sister, on the day preceding the appearance of her eruption, the boy developed chicken-pox.

This fact is not to be wondered at when we remember that smallpox may be transmitted by a patient before the outbreak of the eruption.

The fluid of early varicellous lesions has, in cases in which I have cultured it, always been sterile. No growth takes place on any of the ordinary nutrient media. Examination of the fluid under the microscope shows an almost complete absence of cellular constituents. I have not noted the small round bodies, regarded by many as protozoa, which are found in the clear fluid of variolous vesicles.

Not infrequently varicellous lesions spread on the periphery and develop into bullæ; these may reach the size of a quarter dollar or even larger. The drying of the contents produces flat, yellowish, irregular crusts. The peripheral spreading of varicellous vesicles and pustules is due to secondary infection with staphylococci and streptococci. This condition may appropriately be called *impetigo varicellosa*; it is quite analogous to the *impetigo variolosa* which is so common in bad cases of smallpox. The adventitious skin infection in varicella may produce a secondary fever which may rise to 102 F. or thereabouts and with remissions persist for three or four days. As in smallpox, boils may result from a deeper infection with pyogenic organisms.

DISCUSSION.

DR. J. B. KESSLER, Iowa City, Ia.—We have had a somewhat varied experience in our locality with variola. Whether or not the Spanish-American war had anything to do with changing the eruption of varicella—it seems to me a good many of our physicians, not dermatologists, have made many mistakes in paying more attention to the umbilication than formerly. The past winter I was called to see a family, with five children, the eruption being most extensive on the back. There was a great deal of umbilication, and a good deal of necrotic tissue, the new vesicles being friable and breaking readily. From the character of the vesicles I diagnosed the cases as varicella, which proved to be the case, as they were not quarantined and no one else contracted the disease.

In Des Moines, in an effort to get rid of variola, the board of health passed an ordinance quarantining all cases of varicella as well as variola, and I think in our city we had a number of cases quarantined that were not variola.

The older text-books taught us that the umbilicated vesicle was variola, but I pay more attention to the character of the vesicle than anything else.

The number of cases with us, varicella and variola, have been great but the disease has been mild. In our city we have had but one severe case, an adult probably forty or fifty years of age.

A good many of our people do not call a physician, and I think many cases of variola were not quarantined because of the mildness of the cases and the dread of people in calling a physician and being quarantined for thirty days. We have had a good deal of the so-called Cuban itch. Mild cases of variola they would claim to be Cuban itch.

DR. WILLIAM L. BAUM, Chicago—I was much pleased to hear Dr. Schamberg call attention to the fact that the disease occurs quite frequently in adults and to the occasional presence of the eruption on the palmar surfaces. At Cook County Hospital there have been a number of instances in which the disease attacked adults, during one epidemic several nurses and

one interne contracted it. The character of the eruption is often influenced by medication. Four years ago varicella developed among a number of children suffering from whooping cough. Two of these cases, to whom large doses of bromoform had been given, developed an eruption which consisted of large bullæ surrounded by an extensive hemorrhagic halo.

DR. A. H. OHMANN-DUMESNIL, St. Louis—One point in Dr. Schamberg's paper that interested me very much is the comparatively rare occurrence of varicella in adults. In an epidemic of 960 cases but one case of varicella in an adult was observed by me, a woman of 23, and she only had 6 lesions on the forearm and one in the palm of the left hand, which is also an interesting point, to which Dr. Schamberg called attention. It is not mentioned by the majority of authors and is a location which might lead to a doubt as to the diagnosis concerning the other lesions.

DR. J. B. SHELMIRE, Dallas, Texas—Five years ago, when 40 years of age, I had a personal experience which proved that adults can have varicella. I treated a young lady with varicella and some two weeks afterward I found a vesicle on my chest. They continued to come, and I had them on my body, limbs, palms, soles and scalp. Every authority I consulted said the disease was limited to children, that adults could not have varicella.

A CLINICAL REPORT OF A CASE OF BLASTOMYCOSIS OF THE SKIN FROM ACCIDENTAL INOCULATION.*

NEWTON EVANS, M.D.
BATTLE CREEK, MICH.

The subject of this report is a physician, 28 years of age, who has had unusually good health, with no history of specific or venereal disease or tuberculosis or any tuberculosis in the immediate family.

On December 4, at an autopsy on a case of systemic blastomycosis, he accidentally inflicted a very slight skin wound with the point of a needle on the palmar surface of the left index finger, just in the fold at the junction of the proximal and middle phalanges. The wound was insignificant and apparently healed. At the end of about one week a very small pustule appeared at this point. This was opened and a small drop of pus removed. It was not noticed again until after several days, when a small pustule again appeared and a small drop of pus was evacuated, as before.

The affected area was very small, about the size of a pin head or less. The minute pustule was covered by a very thin layer, probably only the epidermis. The base of the little cavity, after the pus was evacuated, appeared red and granular, and was very tender when touched by any instrument. The lesion, before opening, exhibited little tenderness. This course of events was repeated two or three times until in the first week of January, 1903, when signs of an acute inflammatory process appeared. An area of about 1.5 centimeters diameter became swollen, reddened and painful. This was immediately incised, with an idea that it was an acute pus infection, the incision being about one-quarter of an inch in length. It failed to improve and, on the second day afterwards, a longer and deeper incision was made. At this time the finger was considerably swollen, painful and tender. The axillary lymph-nodes began to swell and at that time there were distinct red lines, following the lymph channels of the forearm (acute lymphangitis.) The axillary glands continued to swell and became more tender. The whole mass became as

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