

A CAUSE FOR UNSUCCESSFUL VACCINATIONS.

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There is a cause for the frequent unsuccessful attempts at vaccination, which is easily avoided, and depends largely upon the much used method of scraping the skin.

Among the many disadvantages arising from this method there are some which seem to us of vital importance. In the first place, the flow of blood which follows the process of scraping the skin, proves a hindrance to the free absorption of the lymph; and if great care be not taken to check the flow, inoculation does not take place and in consequence the vaccination proves a failure.

In other cases there may be a perfect absorption of the lymph and within two or three days there may appear a few small pimples or ulcers the character of which could in nowise justify the conviction that the operation has been successful; for there is but one peculiar scar whose characteristics can guarantee the immunity to smallpox.

Again there frequently arise accidents of such serious character from this method of sacrifice, that we have many times seen the lives of children in danger from diffuse phlegm, erysipelas, gangrenous sores and specific infections, notwithstanding the fact that the operation has been performed with rigorous asepsia and antiseptic precautions, and with lymph of the most approved quality.

One of the strongest objections to this method, to say nothing of its painfulness, and in spite of the fact that it is practiced in accordance with the dictation of science, is that the wound which it leaves may become a focus for infection, and in the end the scar which it leaves is apt to be of a very irregular nature, and very seldom presents the peculiar characteristics that are necessary as proof that one is perfectly immune to smallpox.

All of these inconveniences may be avoided by inoculating by the simple puncture method, which, while not causing the slightest pain, neither permits infection nor the transmission of any other disease, and when it is well practiced is seen to be an operation so painless and simple that it can be performed by any person, either by means of a small lance or a simple needle; care being taken to adhere to the following directions:

Let the aseptic lance first be moistened in the lymph, then taking the arm in the left hand in such a manner as to hold the skin as firmly as possible, prick the skin in three places, the first about two inches below the shoulder, and the other two either below or on each side of the first at a distance of about an inch. Each puncture will be made by introducing the point of the lance or needle into the skin in such a

manner as not to draw the blood. Upon withdrawing the instrument care should be taken to lift the blade and slightly turn it, so as to leave the lymph in the puncture. Each arm should receive at least three punctures. In reference to this last fact, Dr. Mason, of the London Smallpox Hospital, has given us very interesting statistics. As head physician of the hospital during the last twenty-five years, he has had occasion to observe the vaccinations of 6,000 individuals with the following results, the number of deaths being in exact proportion to the number of apparent scars, thus: The mortality of individuals having been vaccinated but possessing no scar was 21, 7 per hundred; those having but one scar, 7, five per cent.; with two scars, 4, 12 per cent.; with three, 1, 7; of those having four or more, 0, 7 per cent., leaving the mortality of those not vaccinated 35.5.

The inoculation being made, no effect is observed until the fourth or fifth day, when there appears in each puncture a small red pimple, which produces a slight itching, and on the sixth day is transformed into a small blister, rather flat in appearance and slightly hollow in the center; by the eighth day this has grown to the size of a pea, is of a grayish white color, the flesh surrounding being slightly inflamed, swollen and hard. On the ninth day the clear liquid of this blister is transformed into the real pus, which by the fifteenth or eighteenth day has dried into a scab; when this falls off there is left a scar which will never disappear, of a lighter color than the surrounding skin, and having its surface marked with darker spots.

The vaccination which has been performed according to the above directions and whose scar at the end of the eighth day presents the characters above described should be considered a sufficient guarantee that the individual is immune to smallpox for the remainder of his life.

Consequently revaccination is unnecessary.

The following table shows the number of inhabitants in Chihuahua, Mexico, number of American inhabitants, general mortality, mortality by smallpox, number of vaccinations, revaccinations and their results, give us some idea of the matter :

Year	Number of Mexican Inhabitants	American Inhabitants	Total number Inhabitants	General Mortality	Mortality from Small Pox	Vaccinated	Re-vaccinated, Mex'n	Re-vaccinated, Am'n	Total Re-vaccinated
1893	18985	575	19560	849	00	795	125	215	340
1894	19753	517	20270	800	00	322	74	79	153
1895	19903	570	20475	808	00	847	141	144	285
1896	20755	753	21508	944	00	762	139	202	341
1897	22892	831	23725	677	00	787	132	145	277
1898	27207	1028	28235	970	07	921	101	77	178

From this we see that during the last seven years there have been but seven deaths caused by smallpox, and these were of children who had never been vaccinated, and Americans having been vaccinated by scarification. Not one person vaccinated by puncture has been attacked by smallpox. Recently there has been quite an epidemic, to which many Americans have fallen victims, causing a mortality of 50 per cent. Out of 1,594 revaccinations, 862 have been of North Americans and 712 of Mexicans, Germans, French, Spanish, Irish and Chinese. The first 775 proved successful, that is to say 89 per cent.

Among the Mexicans only about 2 per cent. took effect, which proves clearly the perfect immunity which they have acquired. This is further confirmed by the fact that they do not fall victims to the smallpox.

The above facts being the result of our experience and observation, we deem it wise to advise the adoption of the following rules for the inoculation of vaccinal lymph. These rules have been formed by the Board of Health of Mexico and slightly revised by the writer. We very much desire the free circulation of these directions throughout all localities in the Republic, hoping that by their strict observance the dreaded disease will disappear entirely from our country:

- I. Vaccination is an effective preventive of smallpox.
- II. It can be administered at any season of the year.
- III. No danger is incurred in being vaccinated, even though there be an epidemic in the locality.
- IV. During the first months of infancy one should be vaccinated.
- V. Inoculation is a simple, painless operation, and when properly done admits no danger of infection or the transmission of any disease.
- VI. The lymph used should come directly from the sore or should be that preserved in small tubes or glasses.
- VII. Lymph coming directly from the running sores of calves is preferred, especially for vaccinations.
- VIII. The place for the inoculation should be well washed with water and antiseptic soap, and afterward with absorbant cotton moistened in a solution of .002 bicloride or boric acid .04, being careful to dry perfectly before proceeding.
- IX. The sore is pricked in different places with a lance or needle, care being taken not to draw blood.
- X. In the transparent liquid which escapes the point of the lance is well moistened, then holding the arm of the person firmly in the left hand, the flesh is pricked in three places, the first about two inches below the shoulder, and the other two either below or at each side of the first at a distance of one inch.

XI. These pricks must be made with only the point of the lance, and in such a manner as not to draw blood, being careful upon withdrawing it to lift up and slightly turn the blade so as to leave the lymph in the puncture.

XII. For each arm vaccinated the lance must be freshly moistened in the lymph.

XIII. If the lymph preserved in the tubes is to be used both ends of the tube are broken; then by means of small rubber bulb, the liquid is softly blown from the tube, and as it drops is received on the point of the lance, and inoculation is performed according to the directions given in X.

XIV. No change is noticed in the appearance of the vaccination until the third day.

XV. Upon the fourth day a small red pimple is noticed in the center of each puncture; this continues to increase in size and produces a slight itching.

XVI. Upon the sixth day this pimple is transformed into a small blister, in appearance a little flat and slightly hollow in the center. This continues to increase in size until the eighth day.

XVII. On the eighth day the vaccination presents the following characteristics: Its size is that of a pea, has a grayish white color, the flesh surrounding it is seen to be inflamed, swollen and hard.

XVIII. If at this stage the sore should be pricked, a clear liquid would flow out; this is the vaccinating lymph.

XIX. At the ninth day this liquid is converted into real pus, which begins to dry and by the fifteenth or eighteenth day has formed a dry scab, which loosens and falls off, leaving behind a scar which never disappears.

XX. The scar proceeding from a vaccination is of lighter color than the surrounding skin, and shows on its surface darker marks.

XXI. Only vaccinations which have been performed according to the above directions and whose appearance on the eighth day have presented the characteristics above described, should be considered successful.

XXII. The fact that but one of the punctures produces a sore is sufficient evidence that the child is legitimately vaccinated, and consequently will be protected from smallpox.

XXIII. If it be possible the vaccination of children should be examined and pronounced efficacious by a physician.

XXIV. If the inflammation around the vaccination should become very intense, a powder composed of the following may be used:

Talcum powder.....	100 gr.
Boric acid.....	15 "
Salicylic acid.....	1 "

Or Johnson and Johnson's Baby Powder; the vaccination should be immediately covered with antiseptic cotton.

XXV. To avoid accidents, which sometimes occur during the period of vaccination it is well:

I. Never to vaccinate a person who has fever, nor any individuals who may be affected by any epidemic or contagious disease.

II. To avoid all counter irritation of the region inoculated, for which the protectors furnished by Johnson and Johnson may be used, also those of Whital Tatum serve the same purpose.

III. To avoid tumors (abcesses) and other eruptions, lymph should not be used from vaccinations that are exceedingly inflamed.

IV. Not to vaccinate when there is erysipelas epidemic in the locality.

V. Never to use lymph which is adulterated or in putrefaction.