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TECHNICAL MANUSCRIPT 183

RETEST REACTION IN A COCCIDIOIDIN-SENSITIVE INDIVIDUAL

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ABSTRACT

The retest coccidioidin reaction in an apparently healthy individual known to be coccidioidin-positive developed more quickly and was of a greater magnitude than that of an equivalent test in a virginal site in the same individual. In both reactions erythema, induration, and/or edema were evident. Although the peak of the retest reaction was at 12 hours, readings made at 24 and 48 hours were in a definitively positive category.

I. INTRODUCTION

No information exists in the literature to answer the question of what would happen if a coccidioidin positive person was skin tested in exactly the same spot as a recent positive reaction. The reaction referred to has recently been called the retest reaction. The retest reaction is defined as the response secured in a hypersensitive individual upon skin testing in the same spot after a recent positive reaction. The retest phenomenon was studied using tuberculin in humans as early as 1914.¹ An extensive investigation using tuberculin in humans was also made in 1925.² The most recent investigation, in 1963,³ used guinea pigs. The investigation by Koch in 1914 utilized the scratch technique of testing. In 1925 Weiss reported mainly on the results of scratch-type tuberculin testing, but stated that similar results in retesting were also obtained with intradermal testing. The general result of tuberculin retesting in positive-reacting individuals was an acceleration of the development and increase in size of the reaction so that the peak was reached before 24 or 48 hours.

The purpose of the present investigation is to present the skin test results obtained in virginal and retest areas in a coccidioidin-positive individual who was in apparent good health.

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1. Koch, H., and W. Schiller. 1914. Über die Reaktionsfähigkeit tuberkulöser Hautstellen auf Tuberkulin. *Z. Kinderheilk* 11:133-142.
 2. Weiss, M. 1925. Recherches sur la sensibilisation locale engendrée par la tuberculin; la répétition homéotopique de la cuti-réaction cause d'erreur dans l'étude des anergies. *Ann. Med.* 17:408-435.
 3. Anderson, B.G., and B.H. Mahman. 1963. The retest reaction in delayed sensitivity. *Lab. Investigation* 12:737-747.

II. METHODS

An apparently healthy white male, aged 37, who was known to be coccidioidin-positive,⁴ was the subject for this investigation. The previous history of this individual included testing with a standard 1:100 dilution of coccidioidin* on 22 August 1960 which produced erythema and edema 35 by 45 mm and an induration 16 by 17 mm at 48 hours. A dilution of 1:1000 coccidioidin given on 13 February 1961 produced a mild erythema and induration that measured 8 by 7 mm.

For the present investigation the retest site on the front of the forearm was conditioned, beginning 4 August 1964, by giving 5 consecutive weekly skin tests in exactly the same place. One-tenth ml of commercial coccidioidin (standard 1:100 dilution) was used for all except the initial test, which used a 1:1000 dilution. Skin tests were given with disposable needles and syringes. Readings were made at 15 minutes and at 6, 12, 24, 48, and 72 hours. Erythema, induration, and edema were measured. At the sixth week two skin tests were given: one in the retest area, and one in a virginal area 6 cm from the retest site, near the hand. Readings were made at the same time periods mentioned above. Photographs were taken at 30 minutes and at the other intervals listed except 12 hours. Two views, top and lateral, were taken at each time period.

III. RESULTS

The first skin test of the present series, using the 1:1000 dilution of coccidioidin, was negative. All following skin tests using 1:100 dilution coccidioidin were positive.

At the sixth week the 15-minute response at the retest site was an area of induration and erythema 11 by 12 mm; in contrast the virginal skin test response was negative. These reactions are shown in Figure 1 taken at 30 minutes. Two small, papular, hive-like lesions developed on the periphery of the erythematous reaction at the retest site. These lesions developed rapidly and subsided with equal rapidity; they were not measured. During the conditioning period of weekly retests, similar lesions were noted on two occasions at the periphery of the erythematous zone of reaction. The time intervals at which they developed were not consistent and, in both instances, they completely subsided within an hour.

4. Smith, G.E., E.G. Whiting, E.E. Baker, H.C. Rosenberger, R.R. Beard, and M.T. Saito. 1948. The use of coccidioidin. Amer. Rev. Tuberculosis 57:330-360.

*Titer Laboratories, Berkeley, California.



Figure 1. Half-Hour Reactions of Virginal (left) and Retest (right) Reactions using Coccidioidin; A. Top View, B. Lateral View.

At 6 hours the retest reaction continued to enlarge and measured 12 by 15 mm for both induration and erythema (Figure 2). The comparative reaction at the virginal site measured 5 by 6 mm of induration and erythema. During the ensuing 6 hours, the reaction at the retest site progressively enlarged, and at 12 hours erythema measured 25 by 30 mm and induration 15 by 15 mm. During the same time period the response at the virginal site also increased in size, though to a lesser degree; both induration and erythema measured 11 by 12 mm.

At 24 hours (Figure 3) both the induration and erythema in the retest area had subsided. The indurated area measured 11 by 12 mm. The erythematous area was relatively unchanged, measuring 30 by 37 mm; however, the intensity had markedly diminished, and the central area was characterized by a faint mottled pink appearance and a peripheral concentric band, 6 mm wide, of slightly greater intensity and homogeneity of color. An area of frank but mild edema extended beyond the periphery of the indurated area to the limits of the erythematous reaction. In contrast, the reaction at the virginal site measured 16 by 20 mm of induration and erythema.

At 48 hours (Figure 4) the dimensions of the reaction at the retest site were 8 by 7 mm for both slight induration and residual erythema of a somewhat dusky hue. The equivalent virginal reaction measurements were 8 by 9 mm of mild induration and erythema.

Only a slight residual dusky erythema and slight induration of 8 by 7 mm remained (Figure 5) in the retest site at 72 hours; at the virginal site, 9 by 10 mm of residual dusky erythema and mild induration persisted.

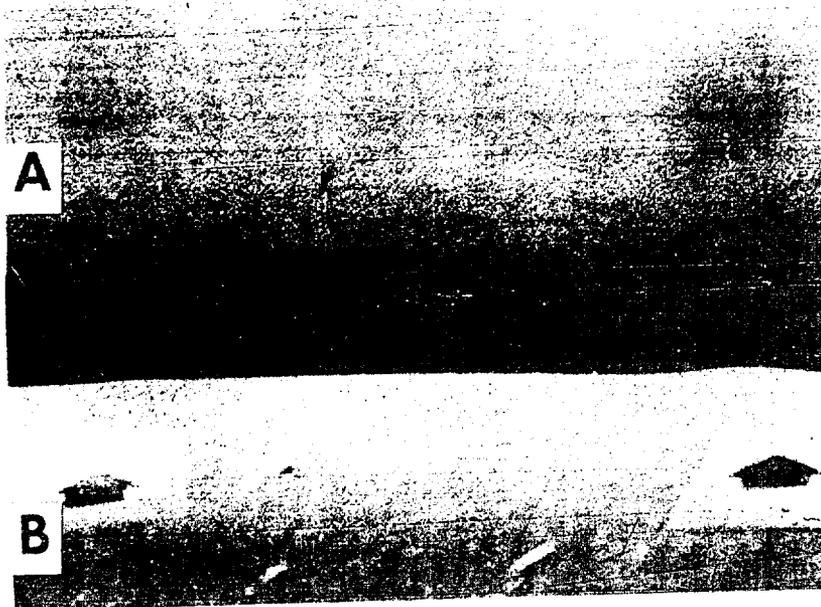


Figure 2. Six-Hour Reactions of Virginal (left) and Retest (right) Reactions using Coccidioidin; A. Top View, B. Lateral View.

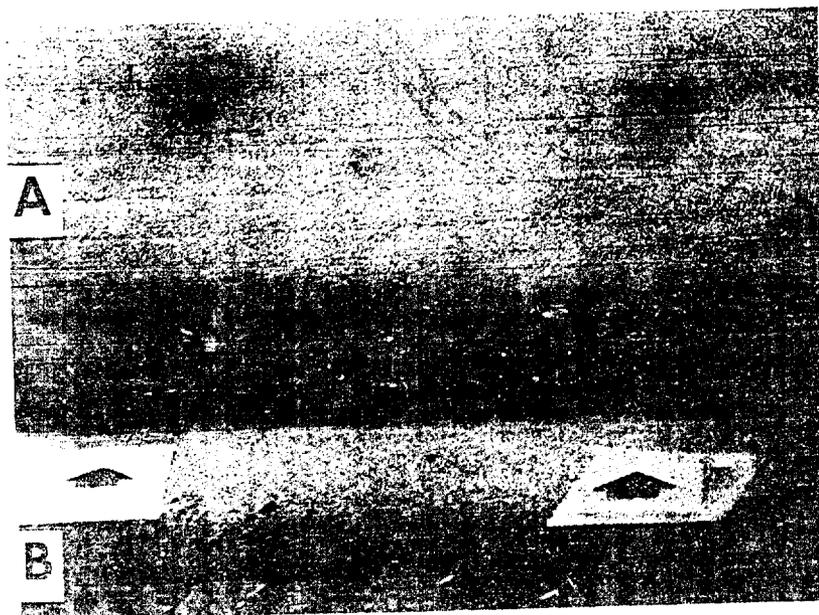


Figure 3. Twenty-Four-Hour Reactions of Virginal (left) and Retest (right) Reactions using Coccidioidin; A. Top View, B. Lateral View.

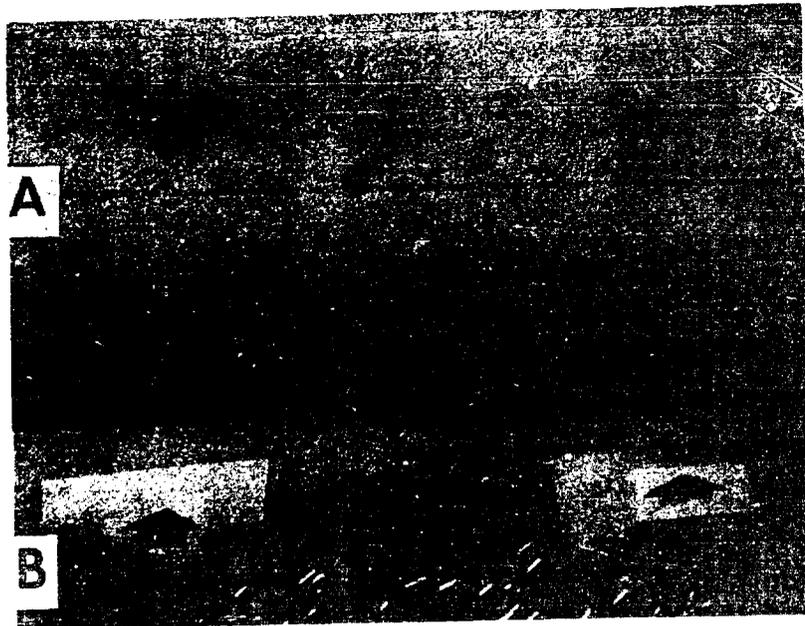


Figure 4. Forty-Eight-Hour Reactions of Virginal (left) and Retest (right) Reactions using Coccidioidin; A. Top View, B. Lateral View.

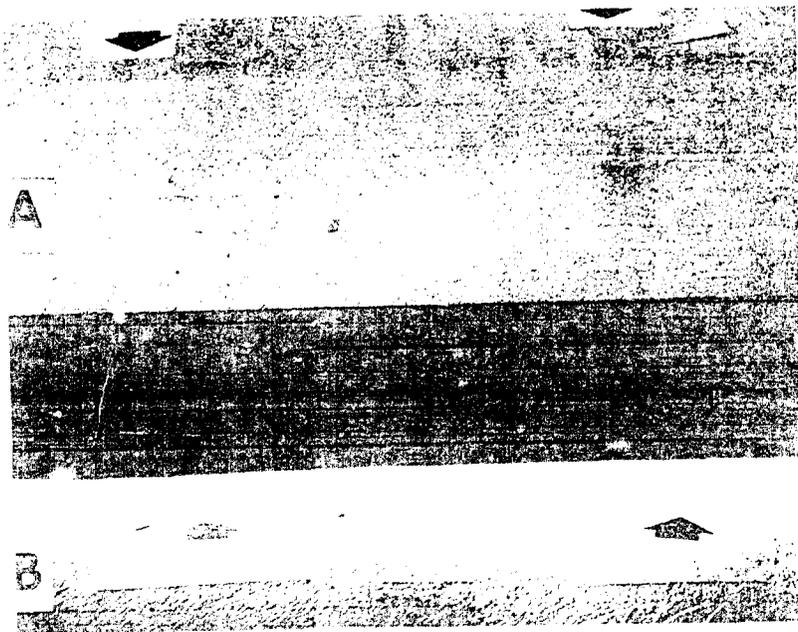


Figure 5. Seventy-Two-Hour Reactions of Virginal (left) and Retest (right) Reactions using Coccidioidin; A. Top View, B. Lateral View.

IV. DISCUSSION

As already described, for those who react positively to tuberculin in the retest site,^{1,2,3} the coccidiin retest reaction develops more rapidly and is of greater magnitude than does an equivalent skin test inoculation in an assumedly virginal area. In the single subject tested, the peak intensity of reaction appeared to be attained some 12 hours before an equivalent peak response in a virginal site. Nevertheless, the accepted 48-hour observation for definitive categorization of positivity or negativity was not compromised, because the measurements were essentially equal at both the retest and virginal sites. It is thus assumed that in the majority of the apparently healthy population there would be little difficulty in assessing the coccidioidin skin test reaction if the skin test were inadvertently given in approximately the same site as a preceding and relatively recent positive reaction. What the retest response and its significance would be in clinical cases of coccidioidomycosis is not known nor does it seem appropriate to devise implied conclusions relative to clinical coccidioidomycosis from the results obtained in the single, very limited investigation.

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