

STREPTOMYCIN DERMATITIS

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IN THE clinical use of streptomycin there are reports of dermatitis developing in professional and technical staffs³⁻⁶ whose duties expose them to preparation of streptomycin for administration to patients or to handling glassware and other equipment contaminated with streptomycin. As similar problems may be encountered in the manufacture of streptomycin, a summary of experience gained over a period of 2 years may be of interest.

In the manufacture of streptomycin it was found that dermatitis developed in a certain number of individuals who handled this antibiotic. Dermatitis did not occur among those who were employed in the fermentation process; it was found only among those engaged in handling the dried purified powder and in those in contact with solutions of streptomycin. It was thus clear that only those whose duties provided close contact with streptomycin developed dermatitis. It was found that dermatitis developed only on the exposed parts of the body, and in the following order of frequency: (1) the hands and forearms, (2) the neck and collar area, and (3) the eyelids. One employee developed attacks of sneezing and rhinorrhea if exposure took place to streptomycin powder in the atmosphere.

In filling vials by hand with streptomycin the employee sat on a chair, dressed in a sterile gown, her hands in sterile rubber (surgical) gloves. The hands and forearms were introduced through an aperture in a rubber cuff into a small sterile cubicle, and manipulation of the drug was done in the cubicle. While this provided a bacteriologically sterile streptomycin product, in a few employees dermatitis developed in the flexures of the elbows or on the forearms. This was ultimately found due to streptomycin powder working through the cotton sleeves of the gown, and coming in direct contact with the skin. Individuals who perspired heavily more easily developed dermatitis. This is of some importance, as moisture seems to facilitate development of dermatitis.

For a period, dermatitis developed in a puzzling manner on the hands, in the glove area, in employees with excellent personal sterile technique. This was ultimately shown to be due to improper washing of the gloves, and was overcome by rinsing the gloves in running water, first on one side, then reversing them, and on the other; and by alkalinizing the washing solution. Dermatitis about the neck was always due to gross carelessness of the employee in handling a contaminated gown, or needless exposure to streptomycin.

There are certain operations concerned with the analysis of specimens of streptomycin which cannot readily be done by technicians wearing gloves. Among this small group, dermatitis of the eyelids occurred in 3 instances. In none of these did dermatitis of the hands, or any other part of the body, occur. It was shown that the dermatitis of the eyelids was due to putting fingers contaminated with streptomycin to the eyes; on controlling this habit, the dermatitis disappeared although the individual continued to perform the same tech-

nical duties. Persons engaged in washing or cleansing equipment contaminated with streptomycin were found to require a high degree of carefulness in protective measures. Solutions of streptomycin, if allowed to splash repeatedly over the unprotected skin, proved a rapid means of sensitizing the skin. It is believed that it is on account of the moisture naturally present about the eyes that dermatitis so readily develops on the lids.

During a period of 2 years, 101 persons were engaged in processes affording possibility of intimate contact with streptomycin. Twenty-one of these developed dermatitis; all had patch tests positive to streptomycin. (A 1 cm. square pledge of cotton gauze soaked in 1 per cent aqueous solution was applied for 48 hours, and read at the end of that time; controls were used in each case.) Blood from 5 women with frank streptomycin dermatitis was withdrawn and used in passive transfer tests. None of these specimens, in the donor sites, showed any reaction to streptomycin patch tests.

Difficulty was at first encountered in having individuals accept the fact that bacteriologically sterile equipment could still carry dermatitis-producing substances in significant amount. With the ultimate satisfactory demonstration of this point, dermatitis disappeared among the employees. In no case did dermatitis due to streptomycin persist for more than 2 weeks following withdrawal from contact. Individuals with a history of previous allergic manifestation did not appear more prone to develop sensitivity to streptomycin than nonallergic individuals. No person developed streptomycin dermatitis who did not have a positive patch test. Thorough indoctrination of the factors leading to dermatitis has resulted in disappearance of the condition.

All of those who developed dermatitis returned to the same work. All were able to continue, without recurrence of dermatitis, unless another break in technique occurred. This latter point should be of considerable practical use and interest. Some cases of dermatitis ascribed to streptomycin are not due to streptomycin at all, and the diagnosis of streptomycin dermatitis should not be considered established without a positive patch test.

The question of whether the development of dermatitis due to streptomycin precludes the parenteral use of streptomycin for therapeutic reasons naturally arises. The absence of circulating antibodies in cases of contact dermatitis, within the limitation of patch testing, has been shown. In a series of 20 cases under active treatment with streptomycin, for tuberculosis at the Royal Edward Laurentian Hospital in Montreal, none were found to have positive patch tests.

Simon reported patch-testing a group of 66 patients who had been treated with streptomycin. Only 2 reacted positively with patch test; 1 of these was in a group of 11 who discontinued treatment because of toxic reaction; neither of these patients suffered from skin manifestations.

On the basis of our experience it is now our formed opinion that dermatitis due to streptomycin never develops except upon direct (skin) contact, and that withdrawal from contact leads to recovery promptly. We have no information upon the length of time required to produce streptomycin skin sen-

sitivity. One person developed dermatitis of the hands after 3 weeks in the department; others after 1 year; and 80 per cent, many with continuous service in the same department for nearly 3 years, never developed any dermatitis.

Apart from dermatitis due to external contact, sensitivity of a more general, and clinically more serious, type may occur. One woman member of a small group, engaged in exactly similar technical duties as the 101 individuals analyzed and reported, developed asthma on entering the room where streptomycin was subdivided. The atmospheric content of streptomycin was not determined, but it must have been minute. Her skin patch test was positive. Unfortunately, contact with her was lost before passive transfer tests and general allergic investigation could be carried out.

SUMMARY

1. Streptomycin dermatitis is preventable; it results solely from contact of streptomycin with the skin.
2. Resolution of dermatitis has not failed to follow withdrawal from exposure.
3. Passive transfer tests in 5 cases of streptomycin dermatitis were negative.

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