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EXPERIMENTAL ECZEMA^{1, 2}

By

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Desensitization in the experimental eczema of the guinea pig due to paranitrosodimethylaniline (PNDMA)

In 1959, W. Jadassohn, Brun & Bujard showed that it was possible to obtain a general desensitization in guinea pigs sensitized with dinitrochlorobenzene (DNCB): it suffices to apply a drop of a primary non-toxic solution (0.1 per cent DNCB in acetone) on a limited area, nipple, for 100 days. After 100 applications, desensitization is shown by the negative or almost negative reaction on the flank after a patch-test. The control group (rest of 100 days, not submitted to desensitization treatment) shows, on the contrary, a strong reaction. Histological examination of the reactions confirms the macroscopic result: no, or almost no lesions in treated guinea pigs, whereas there are spongioses and an infiltrate composed partly of lymphocytes in the guinea pigs of the control group.

Other experiments, of the same nature, with DNCB confirmed these first results; other experiments have shown that, in some groups, 60 applications are sufficient for desensitization, in other groups, 100 applications are not enough and 150 applications are needed (Hunziker 1961 and 1963). This emphasized the fact that there are differences among the different series of guinea pigs.

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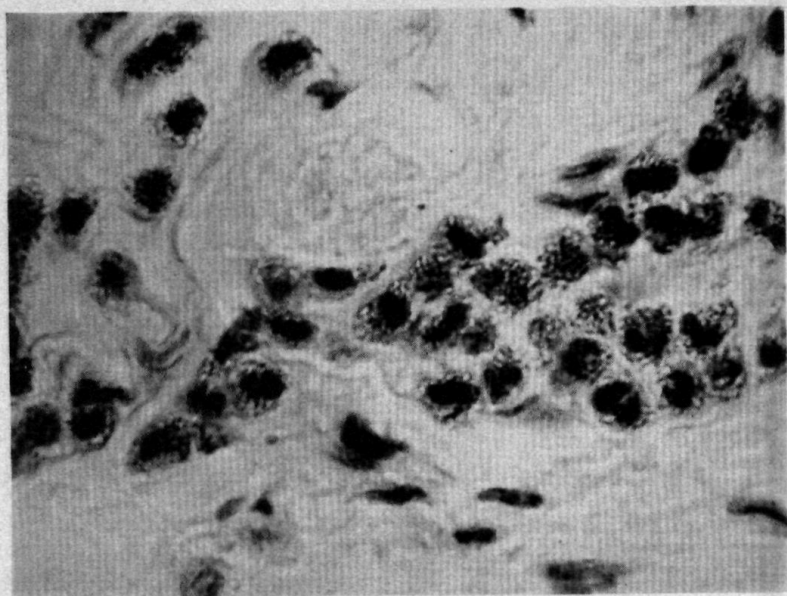


Fig. 1.

Guinea pig sensitized with PNDMA. Patch test on the nipple after 57 days of rest: infiltrate abundant in eosinophils.

This desensitization has been confirmed by *Rajka & Hard* 1960, by *Lowney* 1964 and *Schulz* 1965, with techniques different than ours; furthermore *Lowney* showed that desensitization to DNCB is specific: guinea pigs were sensitized with DNCB and with PNDMA or with DNCB and with Taractan; desensitization to DNCB did not induce desensitization to PNDMA or to Taractan.

This author has furthermore shown a desensitization with Taractan and PNDMA. He writes: "Such hyposensitization is more readily accomplished with some sensitizers (*e.g.* Taractan, MDNA) than with other (*e.g.* DNCB)".

We also have tried to obtain a desensitization to PNDMA in the same manner as with DNCB, but contrary to *Lowney*, we have not confined ourselves to the macroscopic examination of the test, but we have also examined histologically the reactions of the patch tests.

We sensitized albino guinea pigs with PNDMA following our usual technique¹ (*Hunziker* 1962). After having prooved

¹ 14 daily applications on the neck of 5 per cent PNDMA in vaseline.

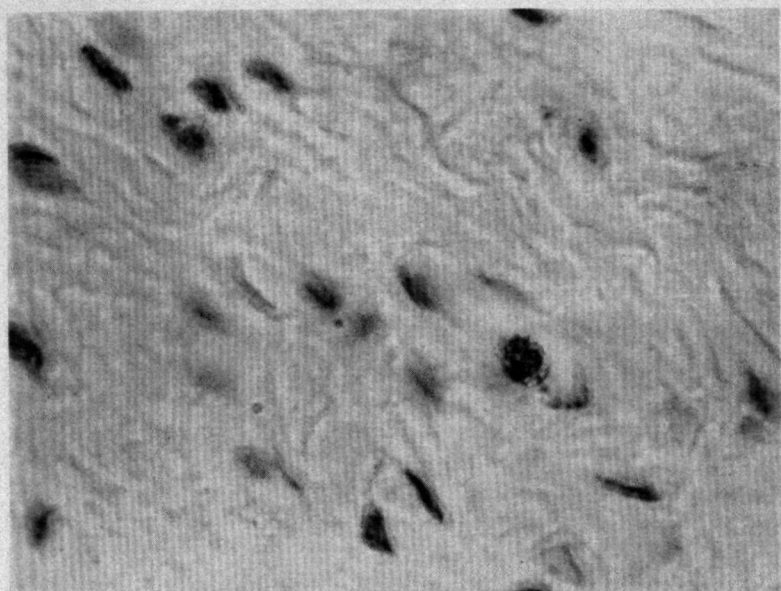


Fig. 2.

Guinea pig sensitized with PNDMA. Patch test on the nipple after 57 days of daily applications of the eczematogen: almost no infiltrate and no eosinophils.

that the guinea pigs were successfully sensitized by macroscopic examination of the patch test, we left a group of guinea pigs at rest and we applied, every day on one nipple of the guinea pigs of the other group, a drop of PNDMA (1 per cent in olive oil, primary non-toxic solution).

After 57 days, we observed a clear difference of the macroscopic reaction on the flank, 14 hours after the patch test. Histological examination showed a great difference between the 2 groups: *with guinea pigs left at rest, not submitted to desensitization treatment, the infiltrate is very important and shows a great number of eosinophils, as we had already observed (Hunziker 1967); whereas there is no, or almost no, infiltrate, with few or no eosinophils, in treated guinea pigs.* The epidermal alterations (acanthosis, cellular swelling, small spongioses) are more important in the group at rest than in the desensitization group.

Histological examination of the nipples, 14 hours after the test, confirms the results we have just described on the flank level. In the group left at rest, the infiltrate is important with numerous eosinophils (Fig. 1) and the epidermis shows, in general, well defined spongioses, whereas in the treated group, the infiltrate is almost inexistant and poor in eosinophils (Fig. 2) and the epidermal spongioses are rare.

We were thus able to obtain a desensitization in the eczema of the guinea pig sensitized to PNDMA, as *Lowney* 1964, has shown. Furthermore, we were able to confirm this result by histological examination. What is most striking in the histological examination of the patch test in desensitized guinea pigs, is the almost complete absence of eosinophils.

SUMMARY

It is possible to desensitize guinea pigs sensitized with paranitrosodimethylaniline. The most striking demonstration of this desensitization is the almost total absence of eosinophils in the dermis, when the patch test is examined.

RESUME

Il est possible de désensibiliser les cobayes sensibilisés à la paranitrosodimethylaniline. La démonstration la plus frappante de cette désensibilisation est le manque presque total d'éosinophiles dans le derme, lorsqu'on examine le test épicutané.

ZUSAMMENFASSUNG

Auf Paranitrosodimethylanilin sensibilisierte Meerschweinchen können desensibilisiert werden. Der auffallendste Befund bei der histologischen Untersuchung des Epicutantestes desensibilisierter Meerschweinchen ist das fast vollständige Fehlen eosinophiler Leukozyten in der Cutis.

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