

From the Royal Victoria Hospital, Belfast, Ireland.

REPOSITORY TREATMENT IN HOUSE DUST ALLERGY

By

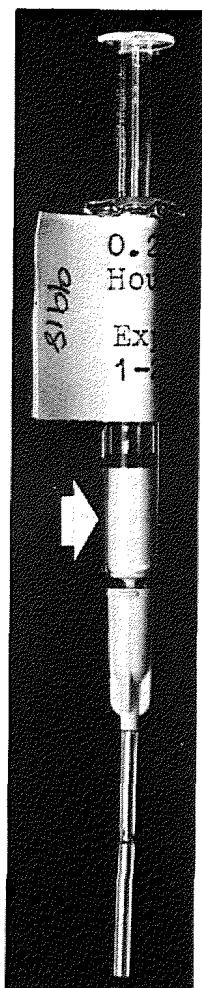
A. C. M. LINDSAY MILLER

The treatment of seasonal rhinitis with pollen extract emulsified in mineral oil became possible following the work of *Couland* (3) and *Freund* (4) who demonstrated the adjuvant properties of this oil in studies with experimental animals. High antibody titres were obtained with complete adjuvant which contained tubercle bacilli but subsequent studies revealed that the same titres could be achieved by using incomplete adjuvant, namely the antigen emulsified with mineral oil alone.

The application of this finding to the treatment in humans of grass and ragweed pollen allergy is well documented. *Loveless* (5) was the first to recognise the potential and with patient experiment over a number of years succeeded in treating pollen sensitive subjects with a single injection of emulsified extract. Doses of the order of 15,000 P.N.U. were achieved which produced satisfactory results. Other workers in the United States and Great Britain (1, 7, 8) became interested and depot therapy, as this form of treatment came to be known, achieved a high degree of popularity. This was due to the elimination of the multiple injection schedules inherent in aqueous therapy. The preparation of these depots, however, necessitated laboratory procedures where sterility was of high priority and many doctors were therefore precluded from using the treatment through lack of time and proper facilities.

Fig. 1.

Photograph of house dust depot syringe.



The world's first commercially prepared emulsions for the treatment of seasonal hay fever and seasonal asthma came from the Bencard Laboratories (9), and a full scale clinical trial was undertaken by a group of consultants (7) which

established both the safety and efficiency of the method. In view of this it was considered by the author that sufferers from perennial allergic rhinitis, which could be demonstrated to be due to house dust allergy, should benefit from the adjuvant effect of house dust emulsions given at more extended intervals than was possible with aqueous boosting therapy. A study with aqueous extracts had already revealed (6) good or very good response in 95.6 per cent of patients who had been maintained for at least one year on monthly booster injections, and it was considered that an advance would be made should it be possible to give this boosting therapy every two or perhaps three months.

MATERIALS

Special house dust emulsions, not yet commercially available, were prepared by *Bencard*. The house dust extract was made by buffered aqueous extraction of raw material collected by vacuum cleaner from numerous domestic sources. The resulting extract underwent a series of processes to remove toxic materials of low molecular weight. The extract was not deliberately enriched with extractable materials from house dust mites, but the latter will be present to the extent that mites occur naturally in the raw house dust collected randomly from a large number of domestic sources.

The water-in-oil emulsion used was similar to that employed so successfully in the treatment of pollen allergy, the difference being that the aqueous phase consisted of purified house dust extract in place of an extract of grass pollen. Also, unlike D-Vac Pollens, the emulsion was unshielded and comprised a single dose as opposed to the three dose course necessary for the treatment of grass pollinosis. This was made possible by the low reactivity of the house dust antigen when compared with the highly reactive grass pollen. Added advantages over the 1ml shielded emulsion were an extended shelf life of three months and a smaller dosage volume of 0.25 ml.

METHOD

Patients were drawn from those attending the hospital out-patients department with perennial allergic rhinitis. To qualify for inclusion in the trial a double plus reaction or greater to a standard Bencard aqueous house dust extract had to be demonstrated, together with a history of being adversely affected clinically by house dust. A duration of symptoms of at least one year was mandatory and of the 33 males treated, 22 had had perennial rhinitis for four years or more.

TABLE 1
Total Improvement Rates.

Total number of patients treated	Very good result	Good result	Nil or poor result
62	38 (61 %)	12 (19.5 %)	12 (19.5 %)
Overall good result			
50 (80.5 %)			

Of the 29 females treated, 21 had had the condition for four years or more. These 33 males and 29 females were treated with house dust emulsions and were reviewed monthly in an attempt to establish the benefit achieved, the lapse of time before improvement was effected, and the duration of improvement before boosting therapy was again necessary. Each patient was seen and questioned personally by the author and the assessment of 'very good' was made only if the symptoms had disappeared. If residual symptoms were still in evidence, but not of a degree to cause discomfort, the result was classified as 'good'. The injections were given subcutaneously in the outer aspect of the upper arm and the depot could be felt as a small nodule which gradually disappeared.

RESULTS

These are summarised in Table 1. Approximately 61 per cent showed a very good response, 19.5 per cent a good response, and the remaining 19.5 per cent either benefited partially or not at all. Fig. 2 is interesting in that it appears to demonstrate that those who show the strongest skin reaction will respond best to specific treatment. Fig. 3 suggests that age is not a barrier to response to hyposensitisation therapy. The average lapse of time between injection and improvement was 3½ weeks, but this varied from one to ten weeks.

At the time of writing, some patients had up to three boosting doses administered at varying intervals as immunity declined, the average being between four and six months. Most of these patients maintained their original improvement and the interval between injection and improvement tended to decrease. Fourteen males received a second depot and three

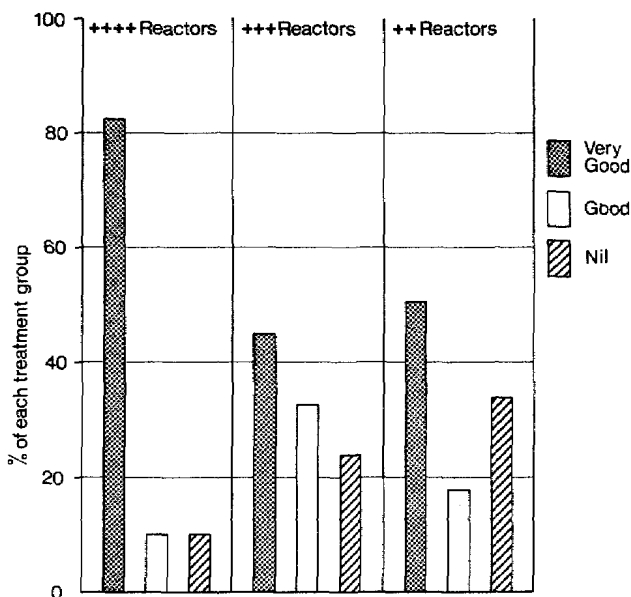


Fig. 3.

Classification of degree of improvement relative to different age groups.

a third depot. Of the 14, the response of 11 could be classified as very good, the response of two as good, and one had no improvement. Of the three males who received a third depot, two could be classified as having had a very good response and again one had no improvement. In the female group, 18 patients received second depots and seven received a third. In the group receiving second depots, ten could be classified as having had a very good response, two a good response, and six showed no improvement. Amongst the seven receiving third booster depots, five had a very good response and two were good. An interesting observation on this type of treatment is that the condition of a number of patients tended to become worse before improvement commenced. Some individuals responded extremely well, one pa-

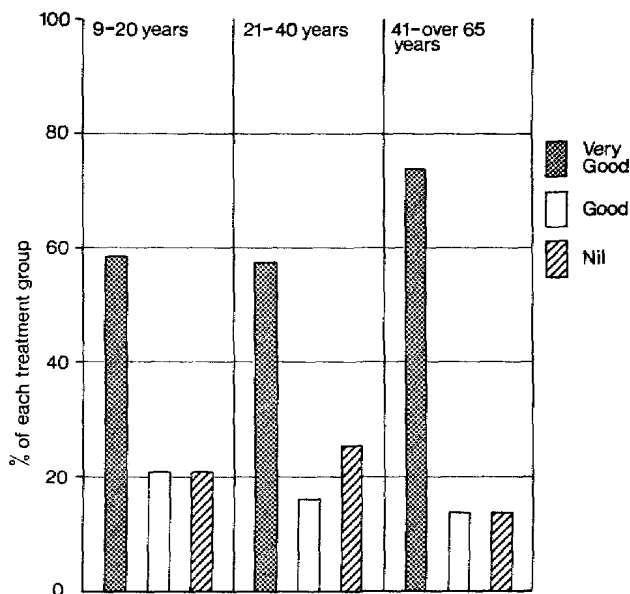


Fig. 2.

Classification of degree of improvement relative to severity of skin-test reaction.

tient going for $2\frac{1}{2}$ years before a boosting injection was required. While it is possible that this may represent a remission of symptoms, I would prefer to regard it as stemming from the original injection.

Side Effects

Amongst the group there were no systemic or local reactions to the injections and no sterile abscess formations occurred.

DISCUSSION

It has been demonstrated by various workers that long continued maintenance therapy with aqueous extracts is of value

in chronic allergic disease (2, 6). In most cases it has been found necessary to administer boosting doses at intervals of four weeks and sometimes less. The immediate antigenic release factor in aqueous therapy, however, makes an interval of more than four weeks undesirable in the treatment of extremely hypersensitive subjects, therefore the advent of delayed release therapy, if successful, would be highly advantageous to the extremely busy patient and especially to those who might have to spend long periods abroad.

There is no doubt, too, that some patients maintain their immunity for much longer periods than others and the more extended interval than is possible with aqueous therapy is again advantageous in such cases. It must be stressed, however, that a single extract emulsion can only be successful if the patient's sensitivity is confined to a single antigen or that antigen is mainly responsible for the symptoms. The presentation of multiple allergens in emulsified form for the treatment of allergy is still in the future.

SUMMARY

Sixty-two patients with perennial allergic rhinitis due to house dust were treated with emulsified house dust extract and an overall good response was obtained in 80.5 per cent. The advantage of this type of treatment is discussed.

ACKNOWLEDGMENT

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