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THE CIRCULATING EOSINOPHIL CELLS IN HAY- FEVER PATIENTS IN RELATION TO SPECIFIC DESENSITIZATION

By

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INTRODUCTION

In a previous paper (1) an account is given of an investigation into the function of the adrenal cortex in patients suffering from hay-fever, in response to specific desensitization with pollen extracts. The excretion of steroids in the urine, the electrolyte content of the blood serum as well as the peripheral eosinophil count were examined in four patients at various intervals during their ambulatory desensitization with increasing doses of Timothy pollen extract.

After the treatment had been finished the patients were submitted to exposure tests by inhalation (sniffing) of Timothy pollen, and the above-mentioned tests were made just prior to the exposure as well as one hour afterwards. A fall was demonstrated in the number of circulating eosinophils. This seems not to be the usual reaction observed in hay-fever patients after exposure: in the same paper the results of the eosinophil counts are recorded before as well as 1 hour after exposure to Timothy pollen of three patients who previously had received no specific treatment whatever. They showed increases in the number of eosinophil cells amounting to 88 %, 54 % and 42 %, respectively. A fourth patient, believed to

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TABLE 1
Eosinophil Counts in previously desensitized Hay-fever Patients.

Pt. No.	Pollen used	Hypersensitiveness of skin	No. of eosinophils per cmm.	
			Before exposure	1 hour after exposure
800/45	Timothy	+	338	150
2128/45	"	+	29	81
423/50	"	+	173	125
1353/51	"	+	282	242
4147/50	"	+	556	288
2233/50	"	+	56	12
1367/48	"	+	56	59
1913/51	"	+	1564	650
3506/51	"	+	525	376
3037/51	"	+	100	56
4467/51	"	+	313	213
958/52	"	+	306	250
3792/50	"	+	200	25

belong to the same group, showed a decrease of 37 % in the count. On going through the anamnestic data of these four patients, however, it turned out that 8 years ago the fourth patient had been given a single series of injections of the German pollen preparation "Helisen". Consequently, he should not have been included in the control material.

MATERIAL

In order to show with certainty whether the number of eosinophil cells does decrease as a result of exposure in patients who had previously been treated specifically, altogether 26 tests with the specific antigen were made on 24 patients, 22 of whom were suffering from hay-fever, while 2 were "fungus allergics" (see below). 13 of the patients had received a series of injections of pollen extracts one year prior to the test, and several of these had been under specific treatment for more than one year; 11 patients (with 13 exposures) had not previously received any treatment at all.

The technique employed for the eosinophil count was the

TABLE 2
Eosinophil Counts in Patients with No Previous Desensitization.

Pt. No.	Pollen used	Hypersensitiveness of skin	No. of eosinophils per cmm.	
			Before exposure	1 hour after exposure
2634/51	Timothy	+	175	325
2597/51	"	+	650	1000
2300/51	"	+	148	288
2630/51	"	+	170	380
3606/50	Artemisia	+	138	156
3919/51	Timothy	+	125	188
3779/51	"	+	356	406
"	Poa pratensis	+	265	325
"	Holcus lanatus	(+)	368	450
2630/51	Timothy	+	170	380
594/51	"	+	138	125
Fungus used				
2853/51	Alternaria	+	118	156
3227/51	"	+	475	631

same as used in the previous tests (Dunger's modified method) and is described in detail in the aforementioned paper.

From Table 1 it will be seen that in the group of previously treated patients a fall in the eosinophil count occurred in 11 cases, while in 2 cases, with rather low values, an increase was recorded. In 1 case the decrease was less than the standard deviation. The average fall in the number of eosinophils was 51 % of the initial value.

The results of the 13 exposure tests on 11 untreated patients (Table 2) showed a consistent increase in the number of eosinophil cells. One of the patients, who had pronounced hypersensitiveness of the skin, was submitted to exposure tests with three antigens, all of which gave rise to typical sneezing, coryza and conjunctivitis. In 2 of the patients the increase was less than the standard deviation. In 1 patient the number of eosinophils fell from 138 to 125 per cmm. The

average rise in the counts was 46 % of the initial value (the three cases showing only a slight rise or fall are included in this calculation).

DISCUSSION

The findings reported above show that there is a distinct difference in the way of reaction between untreated and treated hay-fever patients, and they seem to imply that here, in some way or other, the adrenals play an important role. For the present, however, no conclusions may safely be drawn as to the way in which the organism is affected by specific desensitization.

The last two patients in Table 2 were not suffering from hay-fever but were "fungus allergics" who had never received any previous treatment. After the exposure test they both showed an increase in the eosinophil count corresponding to that of the pollen allergics. Hence it is possible that the theory presented here may also apply to other forms of allergy than pollen allergy. This will be the subject of more detailed investigations to be reported later.

SUMMARY

By counting the number of eosinophils in the blood stream just before, and 1 hour after, exposure to Timothy pollen, varying reactions were demonstrated in hay-fever patients, dependent upon whether or not the patients had previously received specific treatment.

Eleven patients, who had not previously been treated, and 2 "fungus allergics", reacted to exposure with the specific antigen by a rise in the eosinophil count averaging 46 %, while 13 previously treated hay-fever patients showed a fall in the number of eosinophils averaging 51 % of the initial value.

REFERENCE

1. *Dragsted, P. J.*: Acta allergologica, 4: 340, 1951.

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