

AMERICAN ACADEMY OF ALLERGY

INSECT ALLERGY COMMITTEE MARCH, 1963, REPORT

For the past two years the Insect Allergy Committee has been building a registry of persons allergic to insect bites or stings. Registrants are persons who have volunteered to fill out an initial detailed questionnaire and respond to annual inquiry. They represent persons whose names and addresses came to us in part from physicians (most of whom are not allergists) and from persons who wrote directly to the executive office as a result of publicity in newspapers and lay magazines. Patient cooperation has been excellent. By March, 1963, over 2,000 completed questionnaires were returned to our files of approximately 5,000 sent out. Of these, 1,477 replies had been punched onto Keysort cards by the time we had to stop punching in order to evaluate our results. In our tabulations we found many persons who had had several reactions to separate stings and reactions of different kinds to different insects. For instance, mosquitos might produce unusually large local swellings and wasps might induce a generalized reaction with unconsciousness. Arbitrarily, we classified each individual by his most serious reaction and noted the minor reactions only secondarily.

Table I indicates the general characteristics of persons registered by the Insect Sting Registry. Local reactions only were reported by 197 registrants. Some 243 reactions were considered to be "slight general," because there was evidence of mild disturbance such as a few hives, beyond what local swelling and pain might produce. Severe reactions, 374 of them, were life threatening in degree, with 224 of this group becoming unconscious; severe dyspnea, swelling in the throat, or shock also placed a person in this category. "Moderate general reactors" numbered 632 and included persons falling between the "slight" and "severe" categories. Only 31 persons had delayed reactions with no immediate local or systemic reaction. Ninety-seven persons showed both an immediate reaction and a subsequent delayed type reaction to the same sting.

Of 1,477 registrants, 837 are male and 640 female. The percentage of males exceeded that of females in every age group through age 20. After age 20 the percentage of females exceeded that of the males. A peak childhood incidence was found in the 6 to 12 age group: 217 boys (26 per cent of 837 total) and 87 girls (14 per cent of 640 total). In every age group the incidence of "local only" reactions was greater for females than for males. In contrast, males had a higher proportion of severe reactions even in the "over 20 years

Received for publication May 4, 1963.

TABLE I. SEVERITY OF MOST SEVERE REACTION, BY SEX AND AGE GROUP

SEX	AGE GROUP	INTENSITY OF MOST SEVERE REACTION												
		TOTAL		LOCAL		SLIGHT GENERAL		MODERATE GENERAL		SEVERE GENERAL		DELAYED		
		NUMBER	VER (%)	HOR (%)	NUMBER	%	NUMBER	%	NUMBER	%	NUMBER	%	NUMBER	%
Total	Total	1,477	100	100	197	13	243	16	632	43	374	25	31	2
	0-5	97	7	100	19	20	30	31	39	40	6	6	3	3
	6-12	304	21	100	54	18	67	22	132	43	47	16	4	1
	13-20	178	12	100	17	10	32	18	98	55	27	15	4	2
	21-30	112	8	100	20	18	20	18	41	37	29	26	2	2
	31-60	683	46	100	78	11	85	12	284	42	219	32	17	2
	Over 60	96	7	100	8	8	9	9	35	36	43	45	1	1
Not specified	7	-	100	1	14	-	-	3	43	3	43	-	-	-
Male	Total	837	100	100	97	12	146	17	351	42	230	27	13	2
	0-5	72	9	100	13	18	23	32	28	39	5	7	3	4
	6-12	217	26	100	35	16	52	24	96	44	32	15	2	1
	13-20	112	13	100	7	6	17	15	67	60	19	17	2	2
	21-30	56	7	100	7	13	13	23	18	32	17	30	1	2
	31-60	342	41	100	34	10	40	12	131	38	132	39	5	1
	Over 60	37	4	100	1	3	1	3	10	27	25	68	-	-
Not specified	1	-	100	-	-	-	-	1	100	-	-	-	-	-
Female	Total	640	100	100	100	16	97	15	281	44	144	23	18	3
	0-5	25	4	100	6	24	7	28	11	44	1	4	-	2
	6-12	87	14	100	19	22	15	17	36	41	15	17	2	3
	13-20	66	10	100	10	15	15	23	31	47	8	12	2	2
	21-30	56	9	100	13	23	7	13	23	41	12	21	1	4
	31-60	341	53	100	44	13	45	13	153	45	87	26	12	2
	Over 60	59	9	100	7	12	8	14	25	42	18	31	1	1
Not specified	6	1	100	1	17	-	-	2	33	3	50	-	-	-

TABLE II. EFFECT OF ORAL MEDICATION* AT TIME OF STING ONLY
(SLIGHT-GENERAL REACTION CATEGORY, NONHYPOSENSITIZED PERSONS)

INFLUENCE ON REACTION: COMPARED TO PREVIOUS REACTION				
	SAME	BETTER	WORSE	UNKNOWN
Medication—Total = 50 persons	12	3	28	7
No medication—Total = 48 persons	11	1	30	6

*Antihistamine or unstated drugs.

of age'' categories. For both sexes the proportion of severe reactions increased steadily with age.

Generalized reactions occurred without a previous unusual local or other reaction to a sting. Of 243 slight general reactions, 114, or 47 per cent appeared without warning. Of 632 moderately severe reactions, 260, or 41 per cent, were unheralded, and of 374 severe reactions, not only were 143, or 38 per cent, totally unexpected but 43 of these persons could not even recall having been stung previously in their lifetime!

Oral medication alone apparently had little effect on the over-all severity of sting reaction. The effect of oral medication taken at the time of sting was tabulated for nonhyposensitized persons who had had a slight systemic reaction followed by another sting (Table II). This group was chosen for analysis because more drastic measures such as epinephrine and oxygen were not used. Fifty such persons took oral medication. Many specifically named antihistamine drugs. Others just noted that they took "pills" as prescribed. In 12 there was no change in severity of response, in 3 the second reaction was milder than the first, and in 28 it was more severe. (Seven did not state results.) For 48 similar persons who took no medication, in one the second reaction was milder, in 11 it was the same, and in 30 it was worse. Six did not state results.

The efficacy of hyposensitization for insect sting allergy is indicated in Table III. Of 311 persons hyposensitized and re-stung only 3 per cent, 9 persons, report a worse reaction than prior to treatment, 24 felt their reaction was unchanged, and 273 (88 per cent) described lessened reactions compared to their pretreatment state. The severity of the subsequent reaction was not known for 5 individuals. This compares with 479 nonhyposensitized and re-stung persons, of whom 300 showed a worse reaction (63 per cent), 130 had unchanged severity of reaction, and 49 noted that the reaction was milder than that from the subsequent sting. The effect of hyposensitization was equally favorable for local and general reactions of all degrees.

As may be seen in Table IV, the differences between treated and untreated persons are very considerable. Had we obtained a chi-square value of 10.597, it would have indicated only a 1-in-500 probability that the results could have been gathered by chance. The chi-square value actually obtained for the least different comparison, that of local reaction only, was 60.18. Where data is gathered from volunteers, the question of bias from self-selection must always be kept in mind. For instance we might have obtained these results if large numbers of successfully treated persons registered themselves because they

TABLE III. PROGRESSION OF REACTION BEFORE TREATMENT COMPARED TO THE EFFECT OF INJECTION TREATMENT (TREATED, RE-STUNG CASES ONLY)

PROGRESSION OF REACTION BEFORE TREATMENT	SEVERITY OF REACTION TO RE-STING AFTER HYPOSENSITIZATION								
	TOTAL NUMBER	SAME		BETTER		WORSE		RESULT UNKNOWN	
		NUMBER	%	NUMBER	%	NUMBER	%	NUMBER	%
Total	311	24	8	273	88	9	3	5	2
Same	41	16	39	22	54	—	—	3	7
Better	67	—	—	67	100	—	—	—	—
Worse	135	5	4	121	90	8	6	1	1
Unknown or one sting	68	3	4	63	93	1	1	1	1

TABLE IV. EFFECT OF TREATMENT (HYPOSENSITIZATION) ON INSECT STING REACTIONS OF VARIOUS SEVERITY

	TOTAL IN REGISTRY	PERSONS NOT RESTUNG	PERSONS RESTUNG	REACTION FOLLOWING RE-STING		
				SAME	BETTER	WORSE
<i>Locals only</i>						
Treated						
—Number	81	44	37	4	32	1
Per cent		54.4		10.8	86.5	2.7
Untreated						
—Number	110	27	83	36	11	36
Per cent		24.6		43.4	13.2	43.4
<i>Slight general</i>						
Treated						
—Number	129	78	51	4	45	2
Per cent		60.4		7.84	88.23	3.92
Untreated						
—Number	114	29	85	23	4	58
Per cent		25.4		27	4.7	68.3
<i>Moderate general</i>						
Treated						
—Number	364	228	136	7	125	4
Per cent		62.6		5.14	92	2.94
Untreated						
—Number	266	63	203	48	24	131
Per cent		23.6		23.6	11.8	64.6
<i>Severe general</i>						
Treated						
—Number	265	185	80	8	70	2
Per cent		69.9		10	87.5	2.5
Untreated						
—Number	126	34	92	18	9	65
Per cent		27		19.6	9.8	70.6
<i>Serum sickness</i>						
Treated						
—Number	9	5	4		4	
Per cent		55.5				
Untreated						
—Number	22	6	16	5	1	10
Per cent		27.2		31.2	6.25	62.5

TABLE V. SEVERITY OF MOST SEVERE REACTION BY TYPE OF INSECT

ALLEGED TYPE OF INSECT	SEVERITY OF MOST SEVERE REACTION										
	TOTAL NUMBER	LOCAL		SLIGHT		MODERATE		SEVERE		DELAYED	
		NUM- BER	%	NUM- BER	%	NUM- BER	%	NUM- BER	%	NUM- BER	%
Total	1477	197	13	243	16	632	43	374	25	31	2
Bee	425	67	16	64	15	179	42	103	24	12	3
Yellow jacket	373	33	9	56	15	166	45	111	30	7	2
Wasp	311	35	11	46	15	134	43	92	30	4	1
Hornet	39	1	3	8	21	12	31	17	44	1	3
Other	81	31	38	19	24	19	24	10	12	2	2
Unknown	248	30	12	50	20	122	49	41	17	5	2

were pleased by the results of treatment, while unsuccessfully treated persons either died or avoided the Registry. Or we might postulate that the Registry attracted untreated persons who are frightened by increasing severity of their responses to sting, while untreated persons not having increasing reactions fail to register. The responses of the same persons before and after initiation of treatment then becomes of particular importance. It can be seen in Table III that 135 treated persons reported that their reactions prior to treatment were increasing in severity. After hyposensitization 121 of these same persons noted lessened response to stings and only 8 reported that their responses continued to be more severe. Regardless of severity of reaction, results of re-sting consistently favored the treated person by a wide margin. Further, we were unable to establish that oral prescription significantly affected subsequent sting reaction. Although no study based on volunteer reporting can be considered free of selection bias, all available information in this study points to the conclusion that hyposensitization favorably affects the course of allergic response to insect stings.

Hypersensitization is believed by a number of affected persons to lessen their attractiveness to stinging insects. Some statistical support for this idea was found. Of 642 untreated persons, 479, or 75 per cent, were re-stung by

TABLE VI. SEVERITY OF MOST SEVERE REACTION BY MONTH STUNG

MONTH	SEVERITY OF MOST SEVERE REACTION										
	TOTAL NUMBER	LOCAL		SLIGHT		MODERATE		SEVERE		DELAYED	
		NUM- BER	%	NUM- BER	%	NUM- BER	%	NUM- BER	%	NUM- BER	%
Total	1477	197	13	243	16	632	43	374	25	31	2
December-April	74	6	8	9	12	45	61	11	15	3	4
May	70	2	3	9	13	31	44	26	37	2	3
June	150	23	15	27	18	68	45	31	21	1	1
July	297	43	14	53	18	126	42	68	23	7	2
August	374	51	14	65	17	151	40	103	28	4	1
September	229	26	11	31	14	108	47	55	24	9	4
October	81	9	11	17	21	22	27	31	38	2	2
November	27	4	15	5	19	11	41	7	26	—	—
Unknown	175	33	19	27	15	70	40	42	24	3	2

what they believed to be the same kind of insect that caused the initial reaction and at some time (over the years) subsequent to their initial unusual reaction. Of 835 treated persons only 311 or 37 per cent were re-stung. Some of the "protection" of course could be related to caution.

This committee recommends hyposensitization whenever possible for persons who have had one or more systemic immediate-type allergic reactions to insect stings.

The committee recommends that in the absence of any serious medical contraindications, known insect sting-sensitive persons receive prescriptions for a kit containing either an epinephrine aerosol for inhalation or epinephrine by injection to which supplemental antihistamine and steroid tablets may be added. Steroids or antihistamines do not act quickly enough in the acute emergency but are useful adjuncts in treatment. Isoproterenol sublingual tablets may be put in the "emergency kit" but this drug does not counteract shock. Affected persons should be given advice on avoidance of stinging insects and told how to minimize spread of venom by use of a tourniquet or local application of ice. Flicking, *not* mashing, the venom sac of a bee to remove it within two minutes of the sting reduces the venom volume injected.

Bees, wasps, yellow jackets, and hornets were named by our registrants as the most common offenders (Table V); the first three were equivalent to one another in producing severe reactions, and relatively more severe reactions were ascribed to hornets. Other insects named included ant, asp,* deer fly, mosquito and, triatoma. (Identifications were those of the patients and subject to error.)

August was the month of highest incidence of sting reactions, July second, and September third (Table VI). Reactions showed no tendency to be more severe in the later part of the summer as compared with early summer.

Thirty-three per cent of 1,477 persons gave a personal history of hay fever or asthma or gave other specific evidence of atopy. An additional 371 (25 per cent) stated that these conditions occurred in blood relatives. Questionable evidence of allergy (as "sinus trouble") occurred in a total of 185 persons. According to personal and family history, 423, or 29 per cent, were negative for atopy. Of 483 persons with an atopic personal history, 154, or 32 per cent, described intolerance to drugs. Of the 423 persons with a negative personal and family history of atopy, only 62 (15 per cent) described drug intolerances. Severe reactors were equally common in both groups. Hyposensitization was equally efficacious for both groups.

*The Insect Allergy Committee
American Academy of Allergy*

Dr. James Barnard

Dr. Halla Brown

Dr. Norman Cohen

Dr. Monroe Coleman

*An asp is a caterpillar found in southern states. It has spines on its back which puncture skin and can cause allergic reaction.

Dr. William Eisenstadt
Dr. John Fitzgerald
Dr. George Frauenberger
Dr. Claude A. Frazier
Dr. Sidney Friedlaender
Dr. Ben F. Feingold
Dr. Leonard S. Girsh
Dr. Salmon Halpern
Dr. Sidney Jennes
Dr. Carl Jones
Dr. S. D. Klotz
Dr. Harold Lecks
Dr. Robert G. Lovell
Dr. William F. Mitchell
Dr. John S. O'Toole
Dr. Frank Perlman
Dr. Merle S. Scherr
Dr. E. E. Seidmon
Dr. A. J. Sosman
Dr. Edward L. Strem
Dr. Howard K. Sullivan
Dr. Philip Torsney
Dr. Joel D. Teigland
Dr. William Tyson
Dr. Richard Wiseman

Eloise W. Kailin, M.D., Chairman
836 Bonifant Street
Silver Spring, Md.