

ent in hot peppers and other spices that have been consumed in substantial amounts by numerous cultures over the course of centuries in higher doses than could be achieved by transdermal absorption. No clinical pathologic sequela has been attributed to the use of dietary spices.

In summary, I concur with the cautionary note of Levy et al. and agree that this issue needs to be reviewed in an ongoing fashion. With present evidence, however, it appears that capsaicin cream has a favorable safety profile and a lower incidence of side effects than currently available medications used for painful diabetic neuropathy.

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ATRIAL NATRIURETIC FACTOR AFTER ORTHOTOPIC HEART TRANSPLANTATION

To the Editor: Sustained elevation of levels of atrial natriuretic factor in plasma has been reported after human orthotopic heart transplantation despite normal graft function,^{1,2} but the exact mechanisms of the increase are still unknown. Studies of artificial hearts in humans have suggested that cardiac-nerve integrity is not necessary for the release of atrial natriuretic factor,³ but the recipient's atria are still innervated by the posterior nerves, which are not removed or cut in heart replacement. The remnant of the recipient's atria has been considered to be the main determinant of elevated levels of atrial natriuretic factor after heart transplantation or artificial-heart implantation, but the denervated donor heart can also contribute to the level of circulating atrial natriuretic peptide. In fact, no study has yet elucidated the respective contribution of atrial tissue from the donor and the recipient, or whether cardiac-nerve integrity has a role in the secretion of atrial natriuretic factor after human heart transplantation.

A modification of the technique of orthotopic heart transplantation recently introduced in our department allowed us to investigate this problem. With this technique, primarily aimed at reducing the amount of the recipient's atrial remnant in order to avoid hemodynamic disturbances and atrioventricular-valve insufficiency, the recipient's atria are excised completely, and the donor heart is sutured to the recipient's pulmonary veins and venae cavae.⁴ To determine the respective roles of the donor's and the recipient's atria in the secretion of atrial natriuretic factor during the week after transplantation, we compared levels of this factor in six patients undergoing transplantation by this new technique with those in eight patients who had the usual technique, in which a large amount of the recipient's atrium is left in place. Blood samples were collected daily for a week after transplantation, and mean arterial pressure, right atrial

pressure, and cardiac output were recorded. As shown in Table 1, sustained increases in levels of atrial natriuretic factor were observed in both groups during the week after transplantation. In both groups, the levels were elevated after transplantation despite normal heart function, and they did not correlate with right atrial pressure or other systemic hemodynamic measures. Hemodynamic disturbances due to the remnant atria could have explained these observations in the group with partial excision of atria, but not in the group with total excision. These results demonstrate that total excision of the recipient's atrial remnant does not inhibit elevation of levels of atrial natriuretic factor after orthotopic heart transplantation and that cardiac-nerve integrity is not necessary for the release of the factor. Atrial endocrine function is apparently carried out by the denervated transplanted heart.

Elevation of levels of atrial natriuretic factor despite normal heart function and total excision of the recipient's atria suggests a role for other stimuli of secretion of the factor, such as sustained intrinsic sympathetic-nerve activity, abnormal control in the release of atrial natriuretic factor, early mild rejection, inotropic drugs, and administration of glucocorticoid.⁵ Further studies should help elucidate the respective contribution of these stimuli in the secretion of atrial natriuretic factor.

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ANAPHYLAXIS FROM A TICK BITE

To the Editor: Ticks frequently cause human disease by transmitting infectious agents (protozoa, rickettsia, bacteria, and viruses) or by releasing toxins during feeding that are responsible for reactions ranging from local irritation to paralysis.¹ However, Type I (IgE mediated) hypersensitivity has never been implicated, except in Australia, where the paralysis tick *Ixodes holocyclus* has been responsible for symptoms ranging from urticaria to anaphylactic shock in sensitized persons.² We report here the case of a patient in the United States with a severe allergic reaction to tick bites.

A 73-year-old man was evaluated for a history of recurrent anaphylaxis associated with tick bites that occurred near his home in the vicinity of Santa Cruz, California. He was an avid gardener and a lifelong resident of the California coast, and had been bitten by ticks about two or three times a year since childhood. Previous reactions had consisted only of local erythema and induration that disappeared within one or two days after the

Table 1. Mean ($\pm$ SEM) Hemodynamic Measures and Plasma Levels of Atrial Natriuretic Factor during the Week after Orthotopic Heart Transplantation in Patients with Total or Partial Excision of the Atria.

MEASURE*	DAY AFTER TRANSPLANTATION					
	1	2	3	4	5	6
Total excision (n = 6)						
Mean arterial pressure (mm Hg)	82 $\pm$ 8	85 $\pm$ 9	89 $\pm$ 2	85 $\pm$ 4	96 $\pm$ 8	88 $\pm$ 5
Right atrial pressure (mm Hg)	12 $\pm$ 2.6	15 $\pm$ 1.6	12 $\pm$ 2.3	14 $\pm$ 2.3	10 $\pm$ 3.1	14 $\pm$ 2.6
Cardiac output (liters/min)	6.4 $\pm$ 0.43	7.3 $\pm$ 0.67	6.7 $\pm$ 0.89	7.1 $\pm$ 0.16	—	—
Atrial natriuretic factor (pg/ml)	113 $\pm$ 19	232 $\pm$ 36	281 $\pm$ 55	191 $\pm$ 28	302 $\pm$ 25	307 $\pm$ 35
Partial excision (n = 8)						
Mean arterial pressure (mm Hg)	85 $\pm$ 4	87 $\pm$ 6	87 $\pm$ 6	87 $\pm$ 6	88 $\pm$ 6	84 $\pm$ 3
Right atrial pressure (mm Hg)	11 $\pm$ 1.8	13 $\pm$ 2.6	14 $\pm$ 2.9	11 $\pm$ 2.5	9 $\pm$ 1.9	10 $\pm$ 3.3
Cardiac output (liters/min)	5.9 $\pm$ 0.63	6.0 $\pm$ 0.64	5.6 $\pm$ 0.38	6.1 $\pm$ 0.35	—	—
Atrial natriuretic factor (pg/ml)	162 $\pm$ 28	149 $\pm$ 37	121 $\pm$ 28	284 $\pm$ 69	135 $\pm$ 35	160 $\pm$ 37

*Normal level of atrial natriuretic factor, 66 $\pm$ 12 pg per milliliter.

removal of the tick. However, his last two bites before evaluation were associated with generalized urticaria, angioedema of the tongue and larynx, and hypotension within minutes of tick removal. He responded to epinephrine, antihistamines, and corticosteroids on both occasions.

The ticks were identified as *I. pacificus*, a human-biting tick distributed throughout western North America and a carrier of the Lyme disease spirochete and a rickettsia.^{3,4} Using an enzyme-linked immunosorbent assay (ELISA) with the results expressed as net absorbance at 492 nm, we found markedly elevated serum levels of IgE (e.g., 0.404 vs. 0.067) and IgG (e.g., 2.28 vs. 0) antibodies to a whole-body extract of *I. pacificus* in the patient as compared with 12 controls. ELISA inhibition studies demonstrated these antibodies to be specific for the tick extract. Blood leukocytes of the patient released histamine (>20 percent of total) in a dose-dependent, antigen-specific manner on in vitro challenge with ≥ 40 ng of tick extract per milliliter, whereas control leukocytes released no histamine after stimulation at concentrations up to 4 μ g per milliliter. Tick-extract proteins were separated by sodium dodecyl sulfate–15 percent polyacrylamide gel electrophoresis; immunoblot analysis revealed several bands recognized by IgE and IgG from the patient but not the controls (Fig. 1). Several allergens may be shared by this species and *I. holocyclus*,⁵ but a 107-kd allergen appears to be unique to *I. pacificus*.

Our results indicate that ticks may elicit powerful immune responses in susceptible hosts and that they may be responsible for

life-threatening allergic reactions in addition to transmitting infectious disease.

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THE MATCHING GAME

To the Editor: . . . During the recruiting season for the 1990 National Resident Matching Program, we became aware that some internal medicine programs were offering "perks" to prospective applicants that in our opinion denigrate and blur the academic mission of any clinical teaching program. Most institutions simply cannot afford to offer substantial moving allowances; signing bonuses distributed in a graded fashion over the first, second, and third years; or student-loan subsidies. It may be a free marketplace, but academic medicine should not allow such inducements to have a role in competing for applicants. Students should be enticed by quality, not quantity; they are not first-round draft picks for sale. . . .

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BOOK REVIEWS

MANIC-DEPRESSIVE ILLNESS

By Frederick K. Goodwin and Kay Redfield Jamison. 938 pp., illustrated. New York, Oxford University Press, 1990. \$65.

It is a peculiar phenomenon in psychiatry that there are many books about specialty areas, theoretical frameworks, and treatments, but a book such as this one, devoted entirely to one major disorder, is quite rare. Indeed, the last comprehensive book about manic-depressive illness came out some 40 years ago, and we have learned a few things since then. This thorough and most readable book by two highly regarded senior clinicians and researchers in the field is thus a most welcome addition to the clinician's bookshelf.

The authors begin by explaining the spectrum of this illness (probably a cluster of related disorders, including bipolar disease, cyclothymia, and recurrent major depressive disorder) in their initial section on clinical description and diagnosis. This section includes critical aspects of differential diagnosis. The authors remind all physicians that despite the morbidity and mortality of manic-depressive illness, it is the most undertreated major mental illness (less than one third of cases are treated). The second section, on clinical studies, reviews the course and outcome of illness, epidemiology, suicide, substance abuse, and illness in childhood and adolescence. Part three, on psychological studies, covers thought disorder, personality (both during and between episodes), assessment, and creativity. The chapter on creativity is a particular gem, thoughtful-

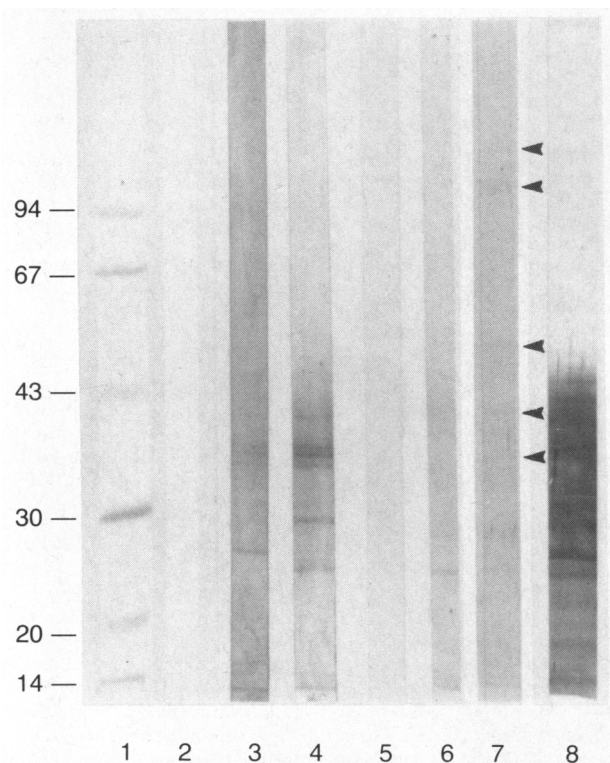


Figure 1. Sodium Dodecyl Sulfate-Polyacrylamide Gel Electrophoresis and Immunoblot Analysis of Tick Extract and IgE and IgG Antibodies to Tick Antigens in Patient and Control Serum.

Molecular-weight standards are shown in lane 1; whole-body tick extract is shown in lane 8. Immunoblots were developed with control and patient serum followed by anti-IgE conjugate in lanes 6 and 7, respectively, and with diluent only (no serum) in lane 5. Allergens of 35, 38, 51, 107, and >110 kd were recognized by the patient's serum (arrows), with the 107-kd allergen the most prominent. Immunoblots were developed with control and patient serum followed by anti-IgG conjugate in lanes 3 and 4, respectively, and with diluent only in lane 2. IgG-binding antigens were seen with serum from the patient at 23, 28, 34, and 40 kd.