Anaphylaxis Encyclopedia Article

Anaphylaxis

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As information about the body's immune responses accumulated in the late 1800s, researchers came to view this biological defense mechanism against invading antigens as invariably protective. A few warning notes were sounded, however. Edward Jenner, the vaccination pioneer, observed in 1798 that patients given an inoculation a second time sometimes had violent reactions. In 1839 French physician Francois Magendie showed that rabbits who tolerated a first injection of egg albumin sometimes died when reinjected.

The first complete study and description of this dangerous immune response was produced by two Frenchmen, physiologist Charles Richet and physician Paul Portier (1866-1962). During a scientific cruise on the yacht of Prince Albert of Monaco, the prince suggested that Portier and Richet study the toxin produced by the tentacles of the Portuguese man-of-war, a jellyfish. They did this, showing that an extract of the tentacles was highly toxic. Back in France, the two continued their studies with extracts of toxin from sea anemone. Seeking to determine the toxic dose, they injected dogs with the venom. Dogs that survived were given time to recover and then reinjected. Richet had expected that the first exposure to the toxin would have created a certain amount of immunity in the dogs. Instead, to his surprise, the initial exposure had made the dogs hypersensitive. A second, much smaller dose of toxin quickly killed them. Since this was the opposite of protective prophylaxis, Richet in 1902 named this hypersensitive reaction *anaphylaxis*.

It soon became apparent that a wide range of substances could trigger anaphylactic reactions. This knowledge provided a valuable warning for physicians engaged in serum therapy; allowing them to check patients for possible sensitization before injecting potentially toxic amounts of serum. Understanding anaphylaxis, also called anaphylactic shock, also helped to explain the wider range of sensitization reactions involved in allergies. Although the majority of allergic reactions are irritating but rarely life threatening, people who develop anaphylaxis--for example, in reaction to insect bites and allergies to food and drugs--are in a potentially life-threatening situation. Usually, symptoms of anaphylaxis, such as hives, abdominal pain, and rapid pulse, arise with seconds or minutes of exposure to an allergen. Because of these important implications, Richet's discovery of anaphylaxis earned him the 1913 Nobel Prize for medicine.