

Case report

Anaphylactic shock after skin test with phytohaemoagglutinin

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A young woman (26 years old), with gastrointestinal candidosis of 8 months duration, was hospitalized in our department to study her cell immunity. Five minutes after an id injection of PHA (bactophytohaemoagglutinin M, Difco, 1 mg), mix moniliae, mix tricophyton and PPD Berna, she showed an extensive wheal and flare reaction in the PHA injection area, eyelid oedema and respiratory distress. In spite of adrenaline, corticosteroid and antihistamine drug administration, the patient collapsed and was admitted to the resuscitation department, where she quickly recovered. In the following days, the patient underwent immune and allergy testing: 1) total IgE immuno-enzymatic assay: 72 KU/l; 2) specific IgE and IgE immuno-enzymatic assay for *Candida*: negative; 3) *in vitro* lymphocyte transformation test (thymidine 2-C^{14}) with PHA Difco was positive. This finding and the positivity of the id injection with PHA could indicate an allergic type I immunoreaction, the description of which we have not found in the international literature (the presence of IgG STS cannot be totally excluded).

D. Schiavino, E. Nucera, F. Murzilli, G. Schinco, G. Papa, G. Fais, G. Patriarca

Department of Allergology, Catholic University of Rome, Italy

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Professor Giampiero Patriarca
Department of Allergology
Catholic University of Rome
Policlinico A. Gemelli
Largo Agostino Gemelli, 8
00168 Roma
Italy

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In recent years PHA has been used both *in vitro* and *in vivo* together with other antigens, in the study of cell-mediated immune reactions by means of skin tests (1, 2, 3, 4, 5, 7, 8, 9).

We would like to report a case of anaphylactic shock, followed by complete recovery, in one of our patients after id administration of PHA. A careful search through international literature has not revealed a similar case.

Material and methods

Case report

A young woman (26 years old) was hospitalized in the Gemelli Hospital in Rome. She had had summer-spring oculorhinitis and bronchial asthma for 3 years and gastrointestinal symptoms (abdominal pain, sialorrhea, oral aphthae) for 8 months. In another hospital, *Candida albicans* was confirmed in pharyngeal exudate and stool.

The patient underwent various diagnostic procedures. Pharyngeal exudate culture: presence of *Candida albicans*. Mycetes serology (specific IgG and IgM for *Aspergillaceae*, *Candida*, micropolispora Faeni): negative. Gastric secretion culture after endo-

scopy: presence of *Candida albicans*. Stool culture: presence of *Candida albicans*.

Further immunological tests were performed: normal T cell lymphocyte subpopulations (OKT8 lymphocytes: 22%, normal values: 24 ± 4 ; OKT4 lymphocytes: 47%, n.v.: 45 ± 7 ; OKT3 lymphocytes: 74%, n.v. 65 ± 7 ; T4/T8 ratio = 2.1, n.v.: 1.7 ± 5).

Results

The patient was sent to our allergology department for a more precise study of cell immunity, with the hypothesis that gastrointestinal candidiasis was connected with T-cell immunodeficiency. The patient's personal history revealed a 3-year spring-summer respiratory disease (oculorhinitis, bronchial asthma) and suspected food allergy (urticaria, tongue and face oedema and a choking sensation after ingesting peaches and figs). The general physical examination was normal except for a slight oral aphthosis.

The results of our immune and allergy testing were the following:

- 1) Skin tests: positive (+ + +) for *Gramineae*, *Compositae*, *Parietaria officinalis*, negative for *Candida albicans*, house mite.

- 2) Specific IgE immuno-enzymatic assay: a) positive (Class 3) for *Compositae* and *Parietaria*, b) negative for phytohaemoagglutinin, *Candida albicans*.
- 3) Candida-specific IgG immuno-enzymatic assay: 1.8 P/N (significant values > 2.5 P/N).
- 4) Total IgE immuno-enzymatic assay: 72 KU/l.
- 5) The intradermal tests for the *in vivo* study of cell-immunity were carried out with: Candidine (*Candida albicans* Lofarma, Milan); Mix moniliae (Hollister-Stier); Mix trichophyton (Hollister-Stier); PPD-Berna: (5 U); PHA (bactophytohaemoagglutinin M, Difco Lab.).

Approximately 5 min after the id injection of PHA (0.10 ml of a solution containing 10 mg/ml) an extensive (10x12 cm) wheal and flare reaction occurred in the injection area together with eyelid oedema and respiratory distress (chest examination revealed no sign of bronchospasm); blood pressure was 100/60 and pulse rate 140/min, regular. The patient was immediately treated with orciprenaline (0.5 mg im), chlorphenamine maleate (10 mg iv), methylprednisolone (80 mg iv) and hydrocortisone (1 g iv); 10 min later the respiratory symptoms regressed.

However, the patient lost consciousness for about 10 s (blood pressure non-existent and cardiorespiratory arrest). Adrenaline (1 mg im) and hydrocortisone (1 g iv) was immediately administered and the patient sent to the resuscitation department. Slight mydriasis and bronchospasm were present. After treatment with oxygen, phlebotomy and small quantities of antihistamine drugs, the patient was kept under intensive care for 24 h and then sent back to the ward.

In the following days, the patient underwent an immuno-enzymatic bioassay for PHA-specific IgE (this test was negative). The *in vitro* lymphocyte transformation test with thymidine $2C^{14}$ was carried out as follows:

- a) PHA Difco, 0.5 mg/ml of culture (6). The stimulation index (SI) was 516.2 (n.v. ≥ 30).
- b) PHA Difco, 0.5 μ g/ml of culture. Blastogenic index: 7.8. With the same dose in 14 control subjects we found a SI of 1,536 ($\pm 1,578$), i.e. no appreciable lymphocyte stimulation. The difference between the 2 groups was statistically significant ($p < 0.005$).

Discussion

The anaphylactic reaction after intradermal administration of 1 mg of PHA appears to belong to Type

I immunoreaction. We must consider the extensive wheal and flare reaction (erythema-pomphus reaction) (++++), the serious clinical features of the disease and the positivity of the lymphocyte transformation test.

Thus, not only are anti-PHA skin-sensitizing specific IgE present (strongly positive skin tests and important associated anaphylactic shock) but also the T lymphocytes recognize the antigen (positive *in vitro* lymphocyte transformation). RAST for PHA-specific IgE was negative, but this could be related to technical problems, such as the link between the antigen and cellulose disks used as a substrate for specific IgE immuno-enzymatic assay. The IgG-STS involvement, responsible for Type I skin immuno-reaction and associated anaphylactic disease, could be another pathogenesis, better explaining the negative RAST. Unfortunately, none of our laboratory findings could explain this phenomenon. This case has been reported because anaphylactic shock after id administration of PHA has not been described in the international literature.

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