

Short communication

Anaphylactic shock by rupture of hydatid hepatic cyst

Follow-up by specific IgE serum antibodies

Saenz de San Pedro B, Cazaña JL, Cobo J, Serrano CL, Quiralte J, Contreras J, Martinez F. Anaphylactic shock by rupture of hydatid hepatic cyst. Follow-up by specific IgE serum antibodies. *Allergy* 1992; 47: 568–570.

Total and specific serum IgE antibodies were estimated in a 68-year-old woman with anaphylactic shock due to spontaneous rupture of hydatid cyst of the liver. After she had recovered, an abdominal ultrasonography showed a cyst, 10 × 15 cm, in the right hepatic lobe. The cyst was surgically removed. Anti-hydatid IgE in the acute phase and periodically after surgical intervention, determined by Phadezym RAST, Pharmacia, and Pharmacia CAP system (a new solid-phase immunoassay, fully automated, for the titration of specific IgE with greater sensitivity in the detection of low IgE antibody levels), showed decreasing anti-hydatid IgE antibodies on day 10 after surgical intervention and may thus serve to monitor the evolution of hydatid disease.

B. Saenz de San Pedro, J. L. Cazaña, J. Cobo¹, C. L. Serrano, J. Quiralte, J. Contreras, F. Martinez

Department of Allergy, ¹ Department of Internal Medicine, "La Paz" Hospital, Madrid, Spain

Key words: anaphylaxis; hepatic echinococcosis; hydatidosis; immediate hypersensitivity; immunologic test; immunoenzyme techniques.

Blanca Saenz de San Pedro, MD
Avd. Navarro Reverter N° 9
46004 Valencia
Spain

Accepted for publication 27 December 1991

Hydatid disease is a parasitic infection caused by the larvae of *Echinococcus granulosus*. Humans are infested predominantly by contact with affected dogs, but also by consuming contaminated vegetables or water. The eggs release the embryos in the duodenum, which then pass to the liver via the portal venous system, where the majority remain (70% of all cysts). The cyst wall consists of an outer layer derived from the liver with chronic inflammatory cells (14, 15, 18), and an inner wall derived from the parasite. The hydatid fluid is clear, consisting of 99.9% water and 0.1% dry protein residue, carbohydrates, lipids and ions (18). Analysis and identification of antigenic components of hydatid fluid by immunoelectrophoresis shows 19 fractions (8); in human hydatidosis, specific serum IgE has been found against the hydatid fluid (1, 10, 13, 17). IgE is mainly raised against 2 of the cyst substances: fraction or Ag 5 and lipoprotein or Ag B, isolated by Oriol & Coll (20). The leakage of hydatid fluid causes local and generalized eosinophilia, and variable anaphylactic reactions, from mild pruritus and urticaria to allergic shock due to hypersensitivity reaction Type I, where IgE plays an important role (2, 4).

Case report

On November 23, 1990, a 68-year-old woman came to the emergency room of our hospital owing to sudden loss of consciousness, after feelings of faintness and discomfort. She was in deep coma, without measurable blood pressure and with generalized erythema and facial angioedema. Medical resuscitation was required, as well as administration of epinephrine and intravenous fluids. After a few minutes, she recovered consciousness. Clinical examination revealed an enlarged liver, and abdominal ultrasound showed a cyst in the right lobe of 10 × 15 cm. Laboratory data of significance included a leukocytosis (16 500/mm³) with eosinophilia 10.6% (1749/mm³) and a mild metabolic acidosis. The patient was surgically treated, by puncture and evacuation of the cyst.

The patient had a history of idiopathic recurrent urticaria since the age of 15 years, i.e. for more than 50 years.

During her stay in hospital, a second ultrasonography was performed and showed a second hepatic cyst of 4 × 8 cm. On December 19, the eosinophilia still persisted with 990 eosinophils (8.6%) from 11 511 leukocytes/mm³. She was treated with me-

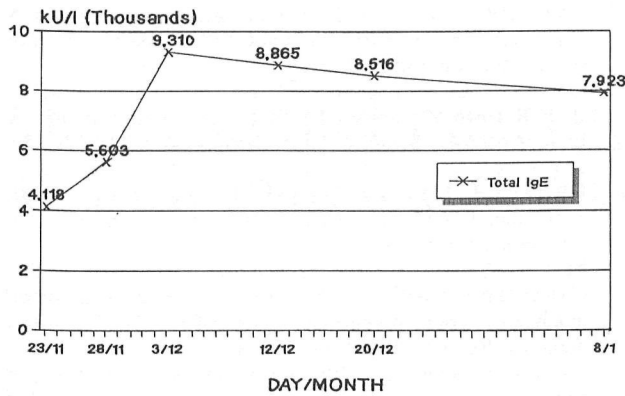


Fig. 1. Total serum IgE levels expressed in kU/l and determined by an immunoenzymatic method (IMX system, Abbot Diagnostic). Initially, an increase of total serum IgE levels was observed, but it diminished after 1 month.

bendazole (40 mg/kg/day) for 6 months. She is without symptoms at present.

Total serum IgE and specific IgE antibodies were estimated in the acute phase, before surgery, and during the following 7 weeks by means of the Pharmacia CAP system and Phadezym RAST in parallel. Initially, total serum IgE antibodies increased but had diminished after 1 month. Specific IgE antibodies decreased on day 10 after surgical treatment, but rose slightly on the following days, perhaps due to the second hydatid cyst (Figs. 1, 2).

An immunoenzymatic method (IMX system, Abbot Diagnostic) of microparticles (MEIA) was used for quantitative determination of total serum IgE. Specific IgE antibodies are determined *in vitro*, generally using a solid phase to which the antigen is bound. RAST (Pharmacia Diagnosis) uses paper discs as the solid phase and employs radio- or enzymoanalytic technique (7, 16); we used the latter,

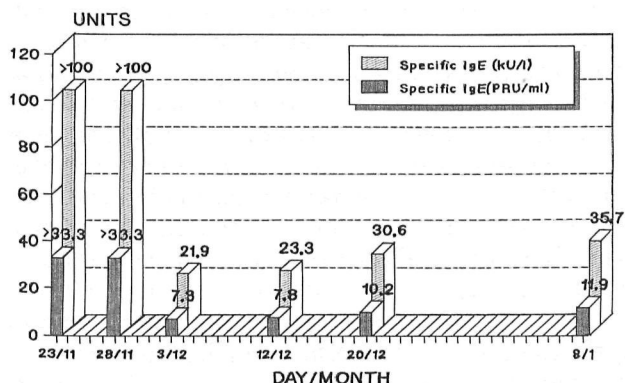


Fig. 2. Titration of serum-specific IgE was done by Phadebas RAST (results listed in Pharmacia RAST U/ml) and by Pharmacia CAP system (results listed in kU/l). The antihydatid IgE antibodies decreased on day 10 after surgical treatment, but rose on the following days, with a good correlation between the 2 methods.

Table 1. Classes. 1 PRU/ml is equivalent to 3 kU/l

Phadezym RAST Pharmacia	Pharmacia CAP System
R-0: <0.35 PRU/ml	C-0: <0.35 kU/l
R-1: 0.35–0.7 PRU/ml	C-1: 0.35–0.7 kU/l
R-2: 0.7–3.5 PRU/ml	C-2: 0.7–3.5 kU/l
R-3: 3.5–17.5 PRU/ml	C-3: 3.5–17.5 kU/l
R-4: >17.5 PRU/ml	C-4: 17.5–50 kU/l
	C-5: 50–100 kU/l
	C-6: >100 kU/l

and the results were expressed in Pharmacia RAST units (PRU/ml) with a range of 0 to 17.5 PRU/ml and the corresponding classes (0–4). The CAP system (Pharmacia Diagnosis) can be performed either as radioimmunoassay (RIA) or as fluoroenzymomimunoanalysis (FEIA); the CAP method uses an encapsulated flexible cellulose derivative (ImmunoCAP) (5, 11) as solid phase, and the system uses polyclonal and monoclonal antibodies ¹²⁵I-labeled (RIA) or β -galactosidase-generating fluorescence (FEIA). We used the second method; the results in kU/l and the classes 0–6 (Table 1).

Discussion

It is important to be aware of anaphylactic shock in connection with hydatid disease in regions where echinococcosis is endemic, such as Spain and other Mediterranean countries, as well as South America and Australia (12, 14), even if the incidence of systemic anaphylaxis is under 1% (3). Rupture of hydatid cysts is potentially life-threatening and hospital doctors should always consider hydatidosis in the differential diagnoses of shock of unknown origin and urticaria. Modern imaging modalities, such as ultrasound, computed tomography and magnetic resonance imaging are helpful in diagnosing the disease (9, 12, 19).

Our patient had had anaphylactic reactions probably secondary to the hepatic cyst. We have reviewed the literature and have found no case with such a long development period.

A good correlation between the levels of total IgE and antihydatid IgE antibodies, using 2 different methods, and the progress of the hydatid disease after surgical removal was evident in the present case.

We, like other authors, suggest periodic determination of specific IgE as a good method of monitoring hydatid patients whether treated with mebendazole (6) or surgery.

Several studies have already examined the correlations between CAP and RAST methods. It has been observed that the CAP system shows greater sensitivity though less specificity than the RAST

method, effectively discriminates low IgE antibody levels from background, and shows no interference from specific IgG (5, 11).

References

1. AFFERNI C, PINI C, MISITI-DORELLO P, et al. Detection of specific IgE antibodies in sera from patients with hydatidosis. *Clin Exp Immunol* 1984; 55: 587-92.
2. AUSTEN FK. Systemic anaphylaxis in the human being. *N Engl J Med* 1974; 291: 661-4.
3. BARROS JL. Hydatid disease of the liver. *Am J Surg* 1978; 135: 597-600.
4. BOCHNER BS, LICHTENSTEIN LM. Anaphylaxis. *N Engl J Med* 1991; 324: 1785-90.
5. BOUSQUET J, CHANEZ P, CHANAL I, MICHEL FB. Comparison between RAST and Pharmacia CAP system: a new automated specific IgE assay. *J Allergy Clin Immunol* 1990; 85: 1039-43.
6. CAMPBELL WC. The chemotherapy of parasitic infections. *J Parasitol* 1986; 72: 45-53.
7. CESKA M, ERIKSSON R, VARGA JM. Radioimmunosorbent assay of allergens. *J Allergy Clin Immunol* 1972; 49: 1-9.
8. CHORDI A, KAGAN IG. Identification and characterization of antigenic components of sheep hydatid fluid by immunoelectrophoresis. *J Parasitol* 1965; 51: 63-8.
9. DE RIOS-VEGA JF, MURO J, PÉREZ-JIMÉNEZ F, et al. Valor de los ultrasonidos en el diagnóstico de los quistes hidatídicos hepáticos. *Rev Clin Esp* 1977; 144: 37-44.
10. DESSAINT JP, BOUT D, WATTRE P, CAPRON A. Quantitative determination of specific IgE antibodies to *Echinococcus granulosus* and IgE levels in sera from patients with hydatid disease. *Immunology* 1975; 29: 813-23.
11. EWAN PW, COOTE D. Evaluation of a capsulated hydrophilic carrier polymer (the immunoCAP) for measurement of specific IgE antibodies. *Allergy* 1990; 45: 22-9.
12. GIULEKAS D, PAPACOSTA D, PAPAConstantinou C, et al. Recurrent anaphylactic shock as a manifestation of Echinococcosis. *Scand J Thor Cardiovasc Surg* 1986; 20: 175-7.
13. ISHIZAKA T, URBAN J, TAKATSU K, ISHIZAKA K. Immunoglobulin E synthesis in parasite infection. *J Allergy Clin Immunol* 1976; 58: 523-38.
14. MARCOS-SÁNCHEZ F, TURABIAN-FERNÁNDEZ JL, CABALLERO-GÓMEZ F, et al. Reacciones alérgicas-shock anafilático como manifestación de enfermedad hidatídica hepática. *Rev Clin Esp* 1984; 173: 49-51.
15. ORTEGA-CARNICER J, PRIETO S. Shock anafilático por roturas espontáneas de quistes hidatídicos hepáticos. *Med Clin (Barc)* 1983; 80: 573-6.
16. PÉCOUD A, PEITREQUIN R, FASEL J, FREI PC. Comparison of two assays for the determination of specific IgE in serum of atopic and nonatopic subjects: the allergenetics FAST and the Phadezym RAST. *Allergy* 1986; 41: 243-9.
17. PÉREZ-ESANDI MV. Isolation and characterization of antibodies from sera of human infected with *Echinococcus granulosus*. *J Parasitol* 1970; 56: 336-9.
18. TORRES-RODRÍGUEZ JM, GUI SANTES JA, YARZABRAL LA. Hidatidosis hepática: nuevos conceptos de una antigua enfermedad. *Med Clin (Barc)* 1980; 74: 69-78.
19. VON SINNER WN. Ultrasound, CT and MRI of rupture and disseminated hydatid cysts. *Eur J Radiol* 1990; 11: 31-7.
20. YARZABRAL LA, BOUT DT, NAGUISE FR, CAPRON PR. Further observation in the specificity of antigen 5 of *Echinococcus granulosus*. *J Parasitol* 1977; 63: 495-9.

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.