CASE REPORT

Bovine serum albumin contained in culture medium used in artificial insemination is an important anaphylaxis risk factor

Juan A. Pagán, M.D., a Idoia Postigo, Ph.D., b Jorge R. Rodríguez-Pacheco, M.D., a Maribel Peña, M.D., a Jorge A. Guisantes, Ph.D., b and Jorge Martínez, Ph.D. b

a Servicio de Alergología, Residencia Sanitaria Virgen de la Arrixaca, Murcia and b Department of Immunology, Microbiology and Parasitology, Faculty of Pharmacy, University of the Basque Country, Vitoria, Spain

Objective: To analyze the cause of the anaphylactic reaction after a standard artificial insemination process in a patient diagnosed with asthma.

Design: Case report.

Setting: Residencia Sanitaria Virgen de la Arrixaca (Murcia, Spain) and University of the Basque Country (Vitoria, Spain).

Patient(s): A 30-year-old woman with a previous medical history compatible with respiratory allergy who suffered an anaphylactic reaction after an artificial insemination with spermatozoids in capable medium (Upgraded B2 INRA medium; Laboratories CCD, Paris, France).

Intervention(s): Cutaneous tests and specific IgE levels to inhalant allergens, grass and *Olea* pollens, and insemination medium were performed.

Main Outcome Measure(s): Specific IgE levels to mammal epithelia and bovine serum albumin (BSA).

Result(s): Skin prick tests were positive for inhalant allergens such as mites, cat, dog, horse, and rabbit epithelia, grasses and *Olea* pollens, and the insemination medium. The β-lactamic tests were negative. The determination of specific IgE demonstrated positive values to mammal epithelia and mammal serum albumins including BSA.

Conclusion(s): We report a case of an anaphylactic reaction to the BSA included in the insemination culture medium induced by a subclinical sensitivity to serum albumins of mammal epithelia. A previous testing with the medium is recommended and specific testing might be needed in women who have a history of animal epithelium allergies. (Fertil Steril® 2008;90:2013.e17–e19. ©2008 by American Society for Reproductive Medicine.)

Key Words: Allergy, anaphylaxis, insemination, bovine serum albumin, epithelium

Some components included in the artificial insemination culture medium, such as penicillin, streptomycin, or bovine serum albumin (BSA), can cause severe allergic reactions (1–4).

Bovine serum albumin is a well-known 68-kDa protein implicated in some cases of food hypersensitivity reactions and it is considered responsible for the cross-reactivity between different types of mammal products such as milk, epithelia, and meat (4–9).

Here we report an anaphylactic reaction after a standard process of artificial insemination caused by the BSA contained in the insemination medium and induced by a subclinical sensitivity to serum albumins of mammal epithelia.

Received March 12, 2008; revised May 6, 2008; accepted May 15, 2008. J.A.P. has nothing to disclose. I.P. has nothing to disclose. J.R.R.-P. has nothing to disclose. M.P. has nothing to disclose. J.A.G. has nothing to disclose. J.M. has nothing to disclose.

Reprint requests: Jorge Martínez, Ph.D., Department of Immunology, Microbiology and Parasitology, Faculty of Pharmacy, University of the Basque Country, P.O. Box 450, 01080-Vitoria, Spain (FAX: 34-945-013014; E-mail: jorge.martinez@ehu.es).
accordance with the European Society of Allergy and Clinical Immunology procedures (11), showed positive results (>3 mm wheal diameter) to mites, grasses and Olea pollens, cat, dog, horse, and rabbit epithelia, and Upgraded B2 INRA medium. The specific IgE (ImmunoCAP; Phadia, Uppsala, Sweden) measurements showed positive levels (>0.35 kU/L) for cat, dog, and rabbit epithelium (41.4, 26, and 1.1 kU/L, respectively); cat, dog, pig, and bovine serum albumins (25.1, 15.2, 1.2, and 0.7 kU/L, respectively); horse serum proteins (10.5 kU/L), and Fel d 1 (12.1 kU/L). The \( \beta \)-lactamic tests (12) were negative.

The sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) immunoblotting (13, 14) carried out using BSA (Sigma-Aldrich Inc., St. Louis, MO) in the solid phase, revealed an IgE-binding component ranging from 60–68 kDa (Fig. 1). The SDS-PAGE IgE immunoblotting inhibition (15) demonstrated that the IgE antibodies were specific for BSA (Fig. 1). Inhibition assays (16) were carried out using four different BSA concentrations (100, 10, 1, and 0.1 mg/mL) and cat, dog, and rabbit epithelia proteins in the solid phase. Results showed a 90% inhibition when rabbit epithelium was used in the solid phase, and 56% and 50% inhibition when cat and dog epithelium were used in the solid phase.

**DISCUSSION**

Although BSA has been described as a cause of anaphylactic reactions after standard insemination processes (2, 3) only one other case has been reported, demonstrating the relationship between sensitization to mammal epithelia and the anaphylactic reaction to BSA (4). The BSA is a well-known 68-kDa protein implicated in some cases of food hypersensitivity reactions and it is considered responsible for the cross-reactivity between different types of mammal products such as milk, epithelia, and meat (5–9).

In the present case, the skin prick test revealed immediate positive reactions to insemination medium and mammal epithelium proteins, suggesting the presence of a specific IgE to the BSA present in the medium and a possible relationship with albumins contained in mammal epithelia.

Cutaneous tests and IgE results by means of specific IgE ImmunoCAP and SDS-PAGE IgE immunoblotting strongly support the implication of BSA in the allergic reaction after artificial insemination. Inhibition studies demonstrate the close relationship between serum albumins contained in mammal epithelia extracts and the BSA contained in the insemination medium. The reported data strongly suggest that the patient was subclinically sensitized to mammal epithelium and that the cross-reactivity with BSA in the medium could be the origin of the anaphylaxis reaction. These results are very similar to those reported by Orta et al. (4), where they also described the same sensitization profile. These investigators also suggest that the cat albumin could be the most likely sensitizing agent. The previous sensitization to serum albumin of mammal epithelia may be an important risk factor to be taken into account during artificial insemination using culture medium containing BSA. A preoperative testing with the medium is definitively recommended and specific testing might be needed in women who have a history of allergy to animal epithelia.

**REFERENCES**