

Wheat-dependent exercise-induced anaphylaxis exclusively during menstruation

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Wheat-dependent exercise-induced anaphylaxis (WDEIA) is considered to be a disease entity induced by the combination of causative food ingestion and physical exercise. In addition, analgesic or alcohol intake and possible other conditions such as fatigue, stress, and infections may trigger anaphylaxis in patients with WDEIA (1). Recently, ω -5 Gliadin (Tri a 19), a plant storage protein, was characterized as the major allergen in WDEIA (2).

A 42-year-old woman presented with a 5-year history of repeated episodes of food-dependent exercise-induced anaphylaxis. The most severe episodes with urticaria and circulatory collapse occurred (i) during a hike to a castle to attend a Harry-Potter-Night following a burger meal, (ii) during a warming-up period following an analgesic (containing 250 mg acetylsalicylic acid, 200 mg paracetamol, and 50 mg caffeine) and a burger meal intake, and (iii) once after ingestion of a self-prepared frozen

pepperoni and salami pizza together with red wine. Exercise, analgesic, or alcohols alone were well tolerated.

Prick testing detected a sensitization to grass pollen matching the history of allergic rhinoconjunctivitis during summer. Extended testing also with standardized food prick testing solutions were all negative. Laboratory measures revealed an elevated total immunoglobulin E (IgE) of 1303 kU/l and specific IgE to wheat (0.69 kU/l) and ω -5 Gliadin (10.6 kU/l), the major allergen in WDEIA. Prick-to-Prick testing of original food such as burger bun remained all unresponsive except for the pizza crust. Provocation tests with the pepperoni and salami pizza with and without physical exercise (45 Watt for 25 min) on a bicycle ergometer were carried out. Physical exercise alone or ingestion of the pizza in the absence of cofactors did not induce any symptoms. In contrast, immediately after the joined exposure to pizza and physical exercise, the patient developed urticaria and a marked dizziness. Unexpectedly, the patient reported that she got her monthly menses during testing. Therefore, the same testing was repeated at another time point in the absence of her menses but no urticaria occurred. In addition, the manufacturer of the salami and pepperoni pizza was contacted to obtain the original pizza ingredients. The patient was again tested during her menses and physical exercise alone could not induce any symptoms. Combined testing with a pizza crust prepared with 250 g original pizza wheat flour and water followed by exercise on a bicycle ergometer lead to generalized urticaria and dizziness proving WDEIA in our patient.

A contribution of gender or female sex hormones in allergic reactions has been discussed for a long time; however,

mechanisms underlying hormone-triggered allergic reactions are still poorly understood (3). Based on medical history, menses was already assumed to be a potential triggering factor of WDEIA, but systematic provocation tests to prove an impact of menses in WDEIA were still missing (1, 4). Recently, Bito et al. demonstrated a patient in which anaphylaxis to cow milk exclusively developed following combined exposure to acetylsalicylic acid, cow milk, and physical exercise at the time of her premenstrual phase (5). Our report is the first that applied systematic provocation tests to outline the triggering potential of menstruation in a patient with WDEIA. As WDEIA in our patient exclusively occurred during her menses, medical history and diagnostic measures of anaphylactic reactions such as provocation tests need to record and include menstruation to diagnose WDEIA and other types of cofactor-induced anaphylaxis.

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