Baker’s asthma in a child

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SUMMARY

**Background:** Baker’s asthma is a well-known occupational lung disease which usually develops in adults. We report the case of a 2-year-old boy who suffered from asthma, urticaria, and atopic dermatitis for twelve months, whose symptoms were associated to visits to his grandfather’s bakery.

**Methods and results:** Skin prick tests (SPT) were made to dust mites, moulds, flours, alpha-amylase, and egg. The SPTs were positive to flours, alpha-amylase, and egg. The determination of specific IgE antibodies showed 2.64 kU/L to wheat, 0.79 kU/L to glyadin, and 2.98 kU/L to alpha-amylase. The patient developed asthma and rhinitis after manipulating wheat flour for 10 min.

**Conclusions:** We demonstrated a type I hypersensitivity to wheat flour and alpha-amylase in a two-year-old child by SPT, specific IgE antibodies and challenge tests. This case in the childhood equivalent of occupational baker’s asthma.

**Key words:** Baker’s asthma. Alpha-amylase. Occupational asthma. Flour hypersensitivity. Child. Early exposure.

**CASE REPORT**

A 2 years old boy started suffering mild asthma, urticaria, and atopic dermatitis from one years old. His parents linked asthma and urticaria symptoms to visits to the boy’s grandfather bakery where his mother worked. Soon she realized he suffered from urticaria and sneezing after contacting with flour powder from her clothes. Besides, he suffered from urticaria whenever he ate egg. Cooked flour, bread and pastry were perfectly tolerated. When he was two years old, he started going to the nursery school, so exposition to the allergen diminished and the child’s disease improved. He only suffered symptoms related to isolated school activity with flour’s play or flour exposures in the grandfather’s bakery. A later oral challenge with egg was carried out at 4 years old with negative result.

**MATERIAL AND METHODS**

SPT’s were performed with dust mites, moulds (Lab. ALK-Abelló, Spain), flour, alpha-amylase, and egg (Lab. CBF-Leti, Spain). It was determined specific IgE antibodies (using CAP System Pharmacia, Uppsala, Sweden) to wheat, glyadin, alpha-amylase, dust mites and moulds. Besides, it was calculated total IgE and carried out challenge test (manipulating and playing with the flour).

**RESULTS**

The wheat, soja, and rye flour, alpha-amylase, and egg prick tests were positive. Wheals diameters of 4, 3, 5.2 and 6 mm were obtained for wheat flour, soja flour, alpha-amylase glyadin, and egg respectively. SPT with dust mite and moulds were negative.
**DISCUSSION**

Baker’s asthma is one of the most frequent occupational diseases and it is only developed by workers. Cereal flour and alpha amylasa used as additive are the responsible allergens. The frequency of sensitisation in exposed workers range from 24 to 34%. As far as we know, none cases of baker’s asthma in children have never been described in literature and the only non-occupational case corresponds to a baker’s wife who had asthma after eating bread (3). Even though our patient’s asthma has not a direct occupational source, he has stayed every day at working hours in a room next to the bakery where his mother worked and was exposed to a high degree of flour and enzymes in a early step of life. According to clinical history and tests results, we recommended the boy to avoid contact with raw flour. Nowadays, his parents live far away from the bakery, and visits to the bakery were suspended, except during the weekends.

Since then, the reported symptoms improve. He only suffered one episode of urticaria and sneezes during a school activity in which his school mates had to handle wheat flour and some times mild urticaria in grandfather’s house situate above the bakery.

Several months ago and after staying in the grandfather’s bakery the child developed asthma crisis and had to stay in hospital for several days. This fact shows that wheat flour sensitisation persists and symptoms reappear when contacting the allergen.

In several publications it has been reported the relationship between the early induction of sensitisation to indoor allergens during infancy and early childhood and the domestic allergen exposure, regardless of the family history of atopy. So, the demonstration of a dose response relationship between exposure to cat and mite allergens and specific sensitisation was possible (4). We think that, in our patient, atopy personal history seems to play an important role in the development of IgE-sensitisation to alpha-amylase, joint with an early and remarkable exposition to this allergen (5). This case follows the behaviour known as “atopic march” (6) that often commences in the first months of life with atopic dermatitis and associated food allergy, leading to other allergic diseases as rhinitis and asthma.

In summary, we have demonstrated by SPTs, specific seric IgE antibodies and challenge test and immediate hypersensitivity (type I) to wheat flour and alpha-amylase in a two years old child with an early exposure to these allergens. We believe that this case is the childhood equivalent of occupational baker’s asthma.

**RESUMEN**

**Caso clínico:** paciente varón que consultó a los 2 años de edad por cuadros de asma y dificultad respiratoria que los padres relacionaban con visitas a la panadería propiedad de los abuelos y en la que la madre trabajaba habitualmente. El niño presenta desde los 4 meses de vida dermatitis atópica y urticaria tras ingestión de huevo desde su introducción en la dieta. El paciente tolera sin problemas harinas cocinadas en forma de pan, bollería y pastas. Los 15 primeros meses de vida el niño permaneció diariamente el cuidado de su madre en una habitación próxima al horno de pan.

**Material y métodos:** se realizaron pruebas subcutáneas en prick test y se midió IgE total y específica por método CAP para harinas de trigo y otros cereales, alpha-amilasa, ácaros, hongos ambientales y ali mentos. Se procedió a realizar provocación controlada en la consulta mediante exposición a harinas que el paciente manipuló durante unos minutos. Los prick tests resultaron positivos para harinas, alpha-amilasa y huevo y negativos para el resto de los inhalantes y alimentos. La IgE total fue de 244 kU/L, el CAP para trigo de 2.64 kU/L, para gliadina de 0.79 kU/L y para alfa-amilasa de 2.98 kU/L. Tras manipular una pequeña cantidad de harina el paciente presentó a los 10 minutos, leves disnea con sibilancias, rinitis con estornudos y rinorrea que cedieron espontáneamente tras retirar al paciente y tras el lavado de manos y cara.

Se recomendó al paciente la evitación de contacto con harinas y se aconsejó no acudir a la panadería. El cuadro clínico ha mejorado con la excepción de urticaria y disnea por manipulación de harina en el curso de actividades escolares y alguna crisis ocasional tras visitar la casa de los abuelos situada sobre la panadería.

**Conclusiones:** se ha demostrado por historia clínica, pruebas in vivo e in vitro y provocación por manipulación la existencia de una sensibilización medida por IgE a la harina y alfa-amilasa. Este cuadro consti-
tuye en la infancia el equivalente al asma ocupacional del panadero.


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**REFERENCES**


