



Allergy to Argan Oil Confirmed by Oral Challenge Test in Children: Case Report

Sara Aminou ^{a*} and Chafiq Mahraoui ^a

^a Department of Pediatric Pneumoallergology and Infectiology, Faculty of Medicine and Pharmacy of Rabat, Rabat Children's Hospital, Mohammed V University of Rabat, Morocco.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJPR/2023/v12i2235

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/98647>

Case Report

Received: 08/02/2023

Accepted: 11/04/2023

Published: 13/04/2023

ABSTRACT

Aims: The prevalence of allergy to Argan oil is increasing over the years. It manifests itself in an extremely polymorphous way and responds to all possible routes of exposure: ingestion, contact or inhalation. The provocation test remains the key examination to confirm an allergy to Argan oil.

Presentation of Case: We report the observation of a six-year-old girl presenting with immediate urticaria after ingestion of argan oil.

Discussion: The allergological investigation points to sensitisation of the skin only, with positive prick tests. An oral provocation test was performed and published for the first time to confirm the diagnosis of allergy to argan oil in our patient.

Conclusion: Argan is widely used for its benefits in the cosmetic industry and as a food ingredient. Further studies are needed to explore the mechanisms of sensitisation to Argan oil.

Keywords: Argan oil; allergy; prick test; oral challenge test.

*Corresponding author: Email: aminousarah40@gmail.com;

1. INTRODUCTION

Argan oil is extracted from the kernels of *Argania Spinosa*, a tropical tree that grows almost exclusively endemically in southern Morocco. Argan oil is traditionally used for its cosmetic, nutritional, and pharmacological properties, due to its high content of fatty acids including oleic and linoleic acid [1]. We report the observation of a child with an allergy to roasted argan oil confirmed by an oral provocation test.

2. PRESENTATION OF CASE

Child aged 6 years, with a history of asthma controlled since the age of 5 years under inhaled corticosteroid therapy, and allergic rhinitis to dust mites and pollens. She developed chickenpox at the age of 4, her mother applied cosmetic Argan oil on the skin lesions for a few days, which caused an aggravation of the rash, the child was treated with anti-histamine and anti-septic, the use of Argan oil was stopped and the rash disappeared in a few days. The mother reported the appearance of urticaria on contact and ingestion of Argan oil. In addition, the ingestion of

nuts, peanuts and rosaceous plants went smoothly.

Pricks tests (SPT) were performed with a standard battery of aeroallergens and several foods giving positive results for dust mites, olive tree, grass pollens and pure roasted Argan oil (Fig. 1) (Fig. 2), while the skin test for other foods including pure cosmetic Argan oil, walnuts, sesame seeds and olive oil were negative. A positive result was defined as a papule of at least 3 mm in large diameter. After parental consent, the allergological work-up was completed by an open oral challenge test with roasted Argan oil. The fat and vitamin content per 100g of the product used is: vitamin E=46mg, fat =99.9g, saturated fatty acid=1.25g, polyunsaturated fatty acid=1.25g, and monounsaturated fatty acid=3g. Our child needs a daily intake of 30g of lipids or 30g of argan oil equivalent to 30ml. We started with 1ml of pure undiluted Argan oil, then 2ml, then 4ml, then 8ml at 20 minutes interval, immediately the child presented a generalized urticaria managed by antihistamine with good evolution (Fig. 3).



Fig. 1. Positive control= 4/20 mm and roasted argan oil= 4/20 mm



Fig. 2. Pricks tests: negative control - positive control - cosmetic argan oil - roasted argan oil



Fig. 3. Generalized urticaria

The child was kept under surveillance for 3 hours. It was concluded that the child was allergic to Argan oil at a cumulative reactogenic dose of 15ml.

3. DISCUSSION

The Argan Spinosa tree, an endemic tree growing in the arid and semi-arid areas of southwest Morocco, is valued for its edible oil extracted from the seeds. This oil is the only edible part of the tree, and is known for its high nutritional value. Argan oil is composed of a glyceride fraction (99%) and an unsaponifiable fraction (1%): the glyceride fraction consists of triacylglycerols, diacylglycerols, monoacylglycerols and free fatty acids, 80% of which are unsaturated such as oleic and linoleic acids (44.8% and 33.7% respectively) [2]. Unroasted Argan nuts are used in the production of cosmetic Argan oil, while edible Argan oil is prepared from roasted almonds, the latter have a hazelnut-like taste, a high content of antioxidants and a low amount of polyphenols [3]. In Morocco, edible Argan oil is used for cooking Tagine, couscous, and other meals. It is also the major component of Amlou, a highly nutritious preparation whose composition also includes large quantities of crushed almonds and honey. In dermatology, several studies have shown that Argan oil has anti-oxidant, moisturising and anti-ageing properties [4].

Traditionally prescribed in skin rashes: chicken pox, juvenile acne and in wound healing. Also prescribed as a liver-protective agent, in cases of hypercholesterolemia and in diabetes [5]. A study showed that the fatty acid content in Argan oil is similar to that of sesame oil and walnut oil, while it is less similar to sunflower, olive, avocado and almond oil [6]. No cross-reactivity with olive oil

has been reported [6]. In 2009, Astrier et al, described a case of anaphylaxis following ingestion of edible Argan oil [7]. Two cases of allergic dermatitis have been described to date [7]. Cases of rhinitis, conjunctivitis related to the smell of Argan oil, and cases of epigastralgia and hypersalivation upon ingestion of Argan oil [8]. It should be mentioned that two cases of acute hypersensitivity pneumonitis have been reported in cosmetic workers exposed to Argan powders [9]. The allergen identified in Argan oil allergy is an 11S globulin protein of 10KDA, which crosses with peanut, sesame and hazelnut allergens [10].

The diagnosis is suspected clinically before an immediate reaction after contact, ingestion or inhalation of Argan oil. The clinical signs are variable: urticaria, erythema, vomiting, respiratory discomfort and even anaphylaxis. No delayed reaction to Argan oil has been reported [11]. The realization of a prick test to pure Argan oil and a specific IgE assay show an IgE mediated sensitization to Argan oil [11]. In the case of our observation, the specific IgE assay was not performed due to lack of resources. The oral provocation test remains a reference examination to authenticate an allergy to Argan oil; it consists in ingesting the food with increasing quantities up to the dose usually consumed; it is done in a hospital under rigorous supervision [12]. The provocation test carried out in our child concluded that he was allergic to Argan oil.

4. CONCLUSION

The cosmetic industry has made Argan oil a major ingredient in a range of products and it is known worldwide as a food ingredient whose use will give better results in the fight against cardiovascular disease, cancer, and diabetes [13]. This rapid development has led to an

increase in the prevalence of allergies to Argan oil. Further studies are needed to explore the mechanisms of sensitisation to Argan oil.

CONSENT

All authors declare that 'written informed consent was obtained from parents of the patient (for publication of this case report and accompanying images).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

ACKNOWLEDGEMENTS

All authors provided assistance in preparation, design, collection, analysis and interpretation the writing of the manuscript. No funding to declare.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Barrientos N, Moreno de Vega M, Dominguez J. Allergic contact dermatitis caused by argan oil in an infant: First Contact Dermatitis Caused by Argan Oil. *Contact Dermatitis*. 2014;71(5):316-7.
2. Lauriola MM, Corazza M. Allergic contact dermatitis caused by argan oil, neem oil, and Mimosa tenuiflora: Allergic Contact Dermatitis Caused by Herbal Therapies. *Contact Dermatitis*. 2016;75(6):388-90.
3. Foti C, Romita P, Ranieri LD, et al. Allergic contact dermatitis caused by argan oil: ACD CAUSED BY ARGAN OIL. *Contact Dermatitis*. 2014;71(3):183-4.
4. Goik U, Goik T, Załęska I. The Properties and Application of Argan Oil in Cosmetology. *Eur J Lipid Sci Technol*. 2019;121(4):1800313.
5. Mechqoq H, El Yaagoubi M, El Hamdaoui A, et al. Ethnobotany, phytochemistry and biological properties of Argan tree (*Argania spinosa* (L.) Skeels) (Sapotaceae) - A review. *Journal of Ethnopharmacology*. 2021;281:114528.
6. Paris C, Herin F, Reboux G, et al. Working with argan cake: a new etiology for hypersensitivity pneumonitis. *BMC Pulm Med*. 2015;15(1):18.
7. El Abbassi A, Khalid N, Zbakh H, et al. Physicochemical Characteristics, Nutritional Properties, and Health Benefits of Argan Oil: A Review. *Critical Reviews in Food Science and Nutrition*. 2014;54(11):1401-14.
8. Paris C, Herin F, Penven E, et al. First evidence of occupational asthma to argan powder in a cosmetic factory. *Allergy*. 2016;71(4):550-5.
9. de las Marinas Alvarez M, Martorell Calatayud C, Castillo Fernandez M, et al. Anaphylaxis After Cutaneous Application of Argan Oil. *J Investig Allergol Clin Immunol*. 2021;31(4):332-4.
10. Guillaume D, Pioch D, Charrouf Z. Argan [*Argania spinosa* (L.) Skeels] Oil. In: Ramadan MF, ed. *Fruit Oils: Chemistry and Functionality*. Cham: Springer International Publishing. 2019;317-52.
11. Menni HB, Belarbi M, Menni DB, et al. Anti-inflammatory activity of argan oil and its minor components. *International Journal of Food Sciences and Nutrition*. 2020;71(3):307-14.
12. de las Marinas Alvarez M, Martorell Calatayud C, Castillo Fernandez M, et al. Anaphylaxis After Cutaneous Application of Argan Oil. *J Investig Allergol Clin Immunol*. 2021;31(4):332-4.
13. El Monfalouti H, Guillaume D, Denhez C, et al. Therapeutic potential of argan oil: a review. *Journal of Pharmacy and Pharmacology*. 2010;62(12):1669-75.

© 2023 Aminou and Mahraoui; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/98647>