

1 **Allergy to Argan oil confirmed by oral challenge**  
2 **test in children: Case report**  
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7 **ABSTRACT**  
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**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.

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30 *Keywords: Argan Oil, Allergy, Prick Test, Oral challenge Test*

31 **1. INTRODUCTION**

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33 Argan oil is extracted from the kernels of Argania Spinosa, a tropical tree that grows almost  
34 exclusively endemically in southern Morocco. Argan oil is traditionally used for its cosmetic,  
35 nutritional, and pharmacological properties, due to its high content of fatty acids including

36 oleic and linoleic acid [1]. We report the observation of a child with an allergy to roasted  
37 argan oil confirmed by an oral provocation test.

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## 39 2. PRESENTATION OF CASE

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



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

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

52 Pricks tests (SPT) were performed with a standard battery of aeroallergens and several  
53 foods giving positive results for dust mites, olive tree, grass pollens and pure roasted Argan  
54 oil (Figure 1) (Figure 2), while the skin test for other foods including pure cosmetic Argan oil,  
55 walnuts, sesame seeds and olive oil were negative. A positive result was defined as a  
56 papule of at least 3 mm in large diameter. After parental consent, the allergological work-up  
57 was completed by an open oral challenge test with roasted Argan oil. The fat and vitamin  
58 content per 100g of the product used is: vitamin E=46mg, fat =99.9g, saturated fatty  
59 acid=1.25g, polyunsaturated fatty acid=1.25g, and monounsaturated fatty acid=3g. Our child  
60 needs a daily intake of 30g of lipids or 30g of argan oil equivalent to 30ml. We started with  
61 1ml of pure undiluted Argan oil, then 2ml, then 4ml, then 8ml at 20 minutes interval,  
62 immediately the child presented a generalized urticaria managed by antihistamine with good  
63 evolution (Figure 3).



64 **Fig. 3: Generalized urticaria.**

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

### 68 **3. DISCUSSION**

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

83 Traditionally prescribed in skin rashes: chicken pox, juvenile acne and in wound healing.  
84 Also prescribed as a liver-protective agent, in cases of hypercholesterolemia and in diabetes  
85 [5]. A study showed that the fatty acid content in Argan oil is similar to that of sesame oil and  
86 walnut oil, while it is less similar to sunflower, olive, avocado and almond oil [6]. No cross-  
87 reactivity with olive oil has been reported [6]. In 2009, Astrier et al, described a case of  
88 anaphylaxis following ingestion of edible Argan oil [7]. Two cases of allergic dermatitis have  
89 been described to date [7]. Cases of rhinitis, conjunctivitis related to the smell of Argan oil,  
90 and cases of epigastralgia and hypersalivation upon ingestion of Argan oil [8]. It should be  
91 mentioned that two cases of acute hypersensitivity pneumonitis have been reported in  
92 cosmetic workers exposed to Argan powders [9]. The allergen identified in Argan oil allergy  
93 is an 11S globulin protein of 10KDA, which crosses with peanut, sesame and hazelnut  
94 allergens [10].

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

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### 106 **4. CONCLUSION**

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108 The cosmetic industry has made Argan oil a major ingredient in a range of products and it is  
109 known worldwide as a food ingredient whose use will give better results in the fight against  
110 cardiovascular disease, cancer, and diabetes [13]. This rapid development has led to an  
111 increase in the prevalence of allergies to Argan oil. Further studies are needed to explore the  
112 mechanisms of sensitisation to Argan oil.

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115 **CONSENT**

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

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120 **Ethical Approval:**

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

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129 **COMPETING INTERESTS**

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131 The authors declare no conflict of interest

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133 **AUTHORS' CONTRIBUTIONS**

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135 All authors read and approved the final version of the manuscript.

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