

## CASE REPORT

# Exploring a rare case of occupational senna allergy

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| <b>Background</b>  | <i>Cassia angustifolia</i> , or senna, is a plant belonging to the Fabaceae family, widely used as a laxative and as a colouring agent in hair dyes. Senna is rarely reported as an occupational allergic sensitizer in the current literature.                                                                                    |
| <b>Aims</b>        | To describe the case and diagnostic approach of a suspected occupational senna allergy.                                                                                                                                                                                                                                            |
| <b>Case report</b> | A male phytopharmaceutical warehouse worker reported bronchial, conjunctival and nasal symptoms immediately upon exposure to senna. We were able to document <i>in vitro</i> sensitization, finding IgE-binding proteins in senna, and <i>in vivo</i> sensitization through positive skin tests and conjunctival provocation test. |
| <b>Conclusion</b>  | Our study confirms that senna may cause occupational rhinoconjunctivitis symptoms with an IgE-dependent mechanism and is the first to confirm it through specific conjunctival provocation test.                                                                                                                                   |
| <b>Key words</b>   | <i>Cassia angustifolia</i> ; conjunctival provocation test; senna allergy.                                                                                                                                                                                                                                                         |

## Introduction

*Cassia angustifolia* (Tinnevely senna or senna), a plant belonging to the Fabaceae family, is widely used as a laxative, approved as a non-prescription drug by the US Food and Drug Administration [1]. Sennoside A and B are the major clinical components responsible for the laxative effect. Free anthraquinones, including rhein and aloe emodin, are also present in small quantities [2]. Senna has been associated with other uses [1], namely as a colouring agent in henna hair dyes [3].

Allergic sensitization to senna has been described among workers exposed in a phytopharmaceutical laboratory [4] and in the process of manufacturing bulk laxatives [5], hair dyes and shampoos [3]. The aim of this study was to report a clinical case of senna-induced allergic symptoms and its diagnostic approach, using specific allergen conjunctival provocation test (CPT). We further studied the molecular mass profile of the senna IgE-binding proteins.

## Case report

We report a case of a 53-year-old man, smoker (20 pack-year), non-atopic, with a previous history of non-allergic asthma, who was referred to our allergy and clinical immunology department for work-related rhinoconjunctivitis and respiratory symptoms. He had been working

as a clerk at a phytopharmaceutical warehouse for the past 30 years; occasionally, he helped packing and storing dried senna leaves and powder. Ten years after starting this work, he began to experience severe nasal and ocular itching, sneezing, rhinorrhoea and nasal blockage when exposed to senna leaves or powder. In the subsequent months, following repeated exposures, he began to suffer dyspnoea, chest tightness, cough and wheezing. These symptoms started immediately after being exposed to senna at work and improved rapidly when leaving the workplace. He had no symptoms at home or when working elsewhere out of mass production. Since he suspected that senna was the triggering agent, he started to avoid contact. Ten years before the onset of his work-related symptoms, he had been diagnosed with non-allergic asthma and rhinitis. He had been treated with budesonide/formoterol, nasal fluticasone and antihistamines, reporting complete disease control.

Skin prick tests (SPTs) were performed with a standard panel of inhalant allergenic sources (*Dermatophagoides farinae*, *Dermatophagoides pteronyssinus*, *Lepidoglyphus destructor*, cat dander, dog dander, *Cladosporium herbarum*, *Aspergillus fumigatus*, *Blatella germanica* and pollens from plane, birch, olive, grass mix, weeds mix and *Parietaria* sp.; LETI®, Spain) and were negative. Skin prick-prick tests (SPPTs) with senna leaves and with a homemade suspension of dehydrated senna powder elicited a positive reaction at 15-min readings, with the following maximum

wheel diameters: senna leaves: 12 mm; senna powder: 10 mm (histamine 10 mg/ml: 4 mm; saline: 0 mm).

Extracts from dried *C. angustifolia* leaf (A) and *C. angustifolia* powder (B) were prepared by homogenization in phosphate-buffered saline, followed by dialysation and lyophilization, as described elsewhere [6]. After obtaining informed consent, a specific CPT was performed, according to previous published guidelines [7], with extract A (5 mg/ml, Roxall®, Spain) at 10-fold increasing concentrations (1/1000, 1/100, 1/10 and 1/1), until either eliciting a positive reaction or reaching the highest concentration. The patient's left eye was used as negative control. A positive reaction in the right eye, with a total ocular symptom score of 6 [7], was obtained at 0.05 mg/ml (1/100). Two non-exposed non-allergic control subjects were subjected to CPT with this extract and both yielded negative results. Since the patient was not currently exposed to senna in his workplace, methacholine bronchial challenge or serial peak expiratory flow measurements at and away from the work environment could not be performed.

Sodium dodecyl sulphate–polyacrylamide gel electrophoresis (SDS–PAGE) and immunoblotting were performed as reported by Laemmli *et al.* [8] and revealed IgE-binding bands of 40 and 29.5 kDa, and a broad and intense one between 25 and 19 kDa (Figure 1) (with large exposure time, two additional bands of 16 and 14 kDa appeared—result not shown). No bands were detected with control sera (pool of sera from non-atopic subjects).

Discussion

Senna allergy is rarely reported in the literature, but systemic reactions elicited by its intake in the form of pills or herbal preparations have been described [9]. Senna sensitization in phytopharmaceutical industry workers has been recognized by Marks *et al.* [5], who found that 15% of workers had positive SPT to senna extract. Only two case reports of senna occupational allergy have been described—a case of asthma and rhinoconjunctivitis in a patient exposed to senna in a hair-dye production [3], and another in a phytopharmaceutical worker [4]. As in our patient, both presented with a positive SPPT to senna. Although senna contain anthraquinones that could produce irritant skin reactions, negative SPPT in a total of 10 atopic and 20 non-atopic controls support the relevance of a positive SPPT [3,4].

The molecular mass of the IgE-reactive bands detected were partially consistent with those described by Helin *et al.* [3]. However, we were unable to identify the IgE-binding *C. angustifolia* proteins, since no report has been published concerning this subject.

Our report is hampered by the absence of a specific bronchial challenge to senna extract or functional evaluation at and away from work. The required

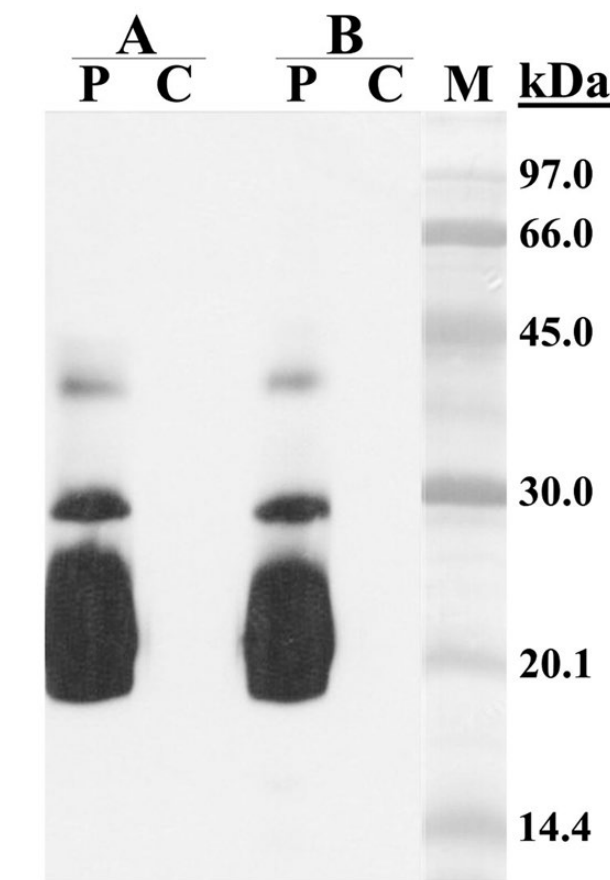


Figure 1. SDS–PAGE immunoblotting. (A) Senna leaf extract. (B) Senna powder extract. Lane P: patient serum; Lane C: control serum (pool of sera from non-atopic subjects). Lane M: molecular mass standard.

conditions to perform specific bronchial challenge were not available. Also, the patient was effectively avoiding allergen exposure and refused to be re-exposed in his workplace or under controlled conditions. In this setting, work-related asthma could not be confirmed. Specific CPT has been recently used as a surrogate test of mucosal reactivity in allergic diseases like rhinitis, asthma, food and latex allergy [7]. In our patient, it proved to be a safe method to document allergy to senna.

In conclusion, we present a case report of senna allergy sensitization with nasal and conjunctival manifestations. We were able to demonstrate sensitization to senna *in vivo*, with positive SPPTs to senna, and confirmed senna-related rhinoconjunctivitis with specific CPT. Furthermore, we also identified senna IgE-reactive proteins in SDS–PAGE immunoblotting assay. Although the patient also mentioned bronchial symptoms when exposed to senna, the lack of documentation of functional changes related to senna exposure prevents us from defining this case as one of work-related asthma. To our knowledge, this is the third case report of senna occupational allergy and the first to confirm an allergic end-organ reaction through CPT.

### Key points

- *Cassia angustifolia*, senna, can cause allergic respiratory symptoms through an IgE-mediated mechanism.
- Although rarely described as an occupational allergic sensitizer, we were able to prove *in vitro* and *in vivo* sensitization to senna.
- Conjunctival provocation test may be useful in confirming end-organ reactivity in this setting.

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### Competing interests

None declared.

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