

**(SS43) New trends of the diagnosis and therapy of pollinosis (in Japanese)**

**Date:** August 25

**Place:** Room 5233 (oral)

**Organizers:** Toru Imai & Reiko Kishikawa

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**Purpose:** Pollinosis is a common disease in almost of all countries. Many patients are suffered from pollinosis having severe rhinoconjunctivitis symptoms and lower quality of life (QOL). This session introduce some guidelines which indicate standard therapy, and new method to treat pollinosis.

Oral Presentation

Aug. 25 [AM1] Room: 5233

Chair: Toru Imai

9:00-9:20      **Development of an artificial allergen exposure chamber (OHIO Chamber) and its current state in Japan** [SS43-O01 \(175\)](#)

Kazuhiro Hashiguchi

9:20-9:40      **Induction of oral tolerance by transgenic rice accumulating Japanese cedar pollen allergens in Japanese monkeys** [SS43-O02 \(442\)](#)

Saburo Saito

Chair: Morio Sudo

9:40-10:00     **A comparison of the ARIA and Japanese guidelines for the management of Japanese cedar pollinosis** [SS43-O03 \(318\)](#)

Atsushi Matsubara

10:00-10:20   **New trends on strategy of pollinosis in Korea** [SS43-O04 \(73\)](#)

Kee-Ryong Choi, Jae-Won Oh, Kyu Rang Kim, Keun Hwa Lee, Yang-Ho Kim, In-Bo Oh, Seulki Park

SS43-O01 (175)

**Development of an artificial allergen exposure chamber (OHIO Chamber) and its current state in Japan**

Kazuhiro Hashiguchi

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Japanese cedar (JC) pollinosis is a seasonal allergic rhinitis (SAR) mainly with nasal and ocular symptoms, caused by JC pollen dispersed usually between February and April in Japan. Recent epidemiological study shows that approximately 25% of the Japanese population suffer from the allergic symptoms and in some regions more than 30% of the people are affected. JC pollinosis can undermine the quality of life, interfere with the activities of daily living and produce a decline in labor productivity, making it an important socioeconomic problem. A large number of anti-allergic drugs with different mechanisms of action have been developed and used for the treatment of SAR in the clinical setting. An allergen exposure studies in a natural environment have been conducted to

examine the effectiveness of these drugs. However, the number of pollen grains dispersed varies each year and among districts, and the temperature and climate are also not constant, making it difficult to reliably compare the results of evaluation of the efficacy and safety of the drugs between different years. To overcome these drawbacks, an allergen exposure chamber that allows exposure to a fixed number of pollen grains in a stable environment has come to be used increasingly for such studies. Owing to the large number of patients with JC pollinosis in Japan, the need was felt for the development of such an environmental exposure chamber for studying JC pollinosis. Therefore, we developed an artificial allergen exposure chamber (OHIO Chamber) designed to allow dispersal of JC pollen in Tokyo. After established some exposure conditions and the scientific validity, several clinical studies to investigate the efficacy and safety of second generation anti-histamines or leukotriene receptor antagonists have been conducted in the OHIO Chamber.

**Keywords:** Japanese cedar pollinosis, allergen exposure chamber, OHIO Chamber, evaluation study.

SS43-O02 (442)

**Induction of oral tolerance by transgenic rice accumulating Japanese cedar pollen allergens in Japanese monkeys**

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Japanese cedar (*Cryptomeria japonica*: CJ) pollinosis affects more than 30% of the Japanese population and is, thus, one of the most common diseases in Japan. Furthermore, CJ pollinosis has been found to occur naturally in Japanese monkeys (*Macaca fuscata*), which show symptoms similar to those of human patients. Oral immunotherapy with allergens is an approach to treating allergic diseases, but for inducing oral tolerance administration of high dose antigens are required. By recent technical progress, it is possible to produce transgenic rice which accumulates antigens at the high concentration. Our previous study showed that oral administration of transgenic (Tg) rice seeds that have accumulated high concentrations (about 60 mg per grain) of polypeptides derived from CJ pollen allergens to mice reduced their serum IgE levels and T-cell proliferative responses to CJ allergens, proving the efficacy of oral immunotherapy for the treatment of pollinosis. The aim of this study is to investigate whether the Tg rice plants that had accumulated high concentrations of CJ allergens is effective to induce oral tolerance for CJ pollinosis of monkeys. The Tg rice seeds accumulating four fragments of a CJ allergen 1 and a shuffled CJ allergen 2 were used in this study. Five monkeys with CJ pollinosis were fed once a day with 20 g of the rice seeds containing about 50 to 60 mg of allergens for 3 months. No side effects, such as urticaria, dyspnea, vomiting, and weight loss, were observed during immunotherapy. One and a half months after the start of feeding, proliferative responses of T cells to JC allergens in 4 of 5 monkeys were significantly inhibited compared with those in monkeys at the start of feeding. Furthermore, their T-cell responses to CJ allergens had been inhibited during the feeding. These results suggest that Oral immunotherapy with the Tg rice seeds accumulating high dose of CJ allergens is safe and effective for the treatment of pollinosis.

**Keywords:** Japanese cedar pollinosis, oral immunotherapy, transgenic rice, Japanese monkey.

SS43-O03 (318)

## **A comparison of the ARIA and Japanese guidelines for the management of Japanese cedar pollinosis**

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Allergic rhinitis (AR) is the most common allergic airway disease. AR is an IgE-mediated allergic disease of the nose caused by inhalation of a variety of allergens, such as house dust mites, pets, insects, and pollens. In Japan, the pollen of the Japanese cedar (*Cryptomeria japonica*) is one of the most common inhalant allergens, and the prevalence of Japanese cedar pollinosis (JCP) is reported that 20-30%. In our epidemiological study, the sensitization rates (specific IgE: 0.35kU/l-) of Japanese cedar were highest among the major inhalant allergens, and reached about 50% in 20s-40s. For the management of AR, some guidelines have been published. Allergic Rhinitis and its Impact on Asthma (ARIA) was first published in 2001 as a state-of-the-art guideline for specialists, general practitioner, other healthcare professionals. Subsequently, ARIA 2008 was an updated version with new knowledge of the mechanisms of rhinitis, new treatments, and prevention. It proposed a new classification for AR as “intermittent (IAR)” or “persistent (PER)” based on the duration of the symptoms, rather than as perennial or seasonal. Moreover, the severity of AR was classified as mild or moderate/severe depending on the severity of symptoms and quality of life. The Practical Guideline for the Management of Allergic Rhinitis in Japan (PG-MARJ) was first published in 1993, and the 6th edition was published in 2009. This guideline classified AR as perennial or seasonal in the conventional manner, and as mild, moderate, severe, most severe, depending on the severity of the nasal symptoms (sneezing or nasal discharge, and nasal obstruction). In our study of JCP, the severity was mild, moderate, severe, most severe at 13.8%, 31.3%, 29.4%, and 23.5% respectively, under the Japanese guideline. On the other hand, under ARIA it was mild IAR, moderate/severe IAR, mild PER, moderate/severe PER at 4.6%, 23.8%, 4.4%, 67.2%, respectively. These results indicate that JCP is a major public health problem because of the severity of symptoms and high prevalence in Japan.

**Keywords:** *Cryptomeria japonica*, IgE, severity grading.

SS43-O04 (73)

### **New trends on strategy of pollinosis in Korea**

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The first study of pollinosis in Korea was reported in 1965. Monitoring of airborne pollen concentrations has started at several sites in early 1980s and has expanded to 12 cities. There have been some advances in knowledge regarding the pollen distributions and its effects in the past few decades. Recently many scientists in Korea have been concerned with specific pollen causing allergy and pollen prediction in response to climate change. The Korean government has created 5 Allergic Research Centers in the nationwide associated with new Environmental Health Law since 2006. One of major purposes of these centers is to monitor allergenic pollen and pollinosis characteristics.

Based on results from study groups in the Centers, it was found the peak of pollen dispersal occurs in spring/fall in major cities of Korea. Tree and herb pollens were mainly observed during March–May and May–September (two peaks in a single years), respectively. Alder (March), oak (April), and pine (May) were detected at high concentration during the peak season of trees pollens. Japanese hop (August), mugwort (August), and ragweeds (September) were mostly detected for the herb pollen season. Annual measurements in Korean cities showed that pine (68%) and oak (15%) are major pollen species. As one of the government actions to prevent allergic diseases, Korea Meteorological Administration (KMA) established a forecast system issuing day-to-day warnings of allergenic pollens from trees and herbs. Recently, the frequency of pollinosis, including allergic rhinitis, has increased in children and many studies have investigated the relationships between the concentrations of allergenic pollens and the clinical manifestations of allergic diseases. Some paper reported the sensitization rates to Japanese cedar extract in Jeju Island are 33.8% and this percentage is the highest in Korea. The types and concentrations of airborne pollen were affected by the surrounding vegetation and environment. Local and regional measurements and clinical researches are continuously performed to find a relationship between allergenic pollen and pollinosis. Especially understanding of pollen behavior in time and space and its future changes using numerical models will be needed to prevent pollinosis.

**Keywords:** Republic of Korea, pollinosis, airborne pollen, monitoring system, forecast system.