



For Immediate Release

HKSH Allergy Centre Develops a Clinical Framework for Effective Use of Biologics in Severe Asthma and Allergic Diseases

(10 November 2020, Hong Kong) Hong Kong Sanatorium & Hospital's Allergy Centre recently published an evidence-based research review on the application of biological therapies (biologics) in allergic diseases in *Asian Pacific Journal of Allergy and Immunology*. Dr. Tak Hong LEE, Director of Allergy Centre and the principal author of the paper, together with colleagues from Canada and the UK, proposed a pragmatic framework to facilitate day-to-day patient care by helping medical practitioners to select the optimal biologic(s) to use in patients with severe asthma. The research suggested that the launch of new biologics will revolutionise the treatment of allergic diseases and herald an unprecedented era of personalised medicine.

Allergic diseases such as asthma, rhinitis, eczema, urticaria and food allergies are common in Hong Kong and often co-exist. Patients may be allergic to multiple allergens. In severe cases, mental and financial burden impact greatly on patients' and their families' qualities of daily living. It is estimated that 5% to 10% of asthmatic patients are so severe that current treatments are unsatisfactory. These patients are responsible for 95% of the asthma-related healthcare and economic burden in society.

In general terms, allergic diseases can be controlled by avoiding the causative allergens, suppressing symptoms by medications, or introduction of allergen immunotherapy (AIT). AIT is allergen-specific and disease-modifying. However, it will have little or no role to play in patients who are allergic to multiple allergens or when no allergens are identified.

Recently, monoclonal antibodies (mAbs) have emerged as one of the state-of-the-art options in controlling allergic diseases, especially for those patients who had tried other drugs but failed. MAbs are a type of biologics that have already been widely used for treating cancers, rheumatic diseases and immunological disorders. MAbs are designed to block the inflammatory cascade that triggers the disease process by binding specifically to key target molecule(s) in those pathways.

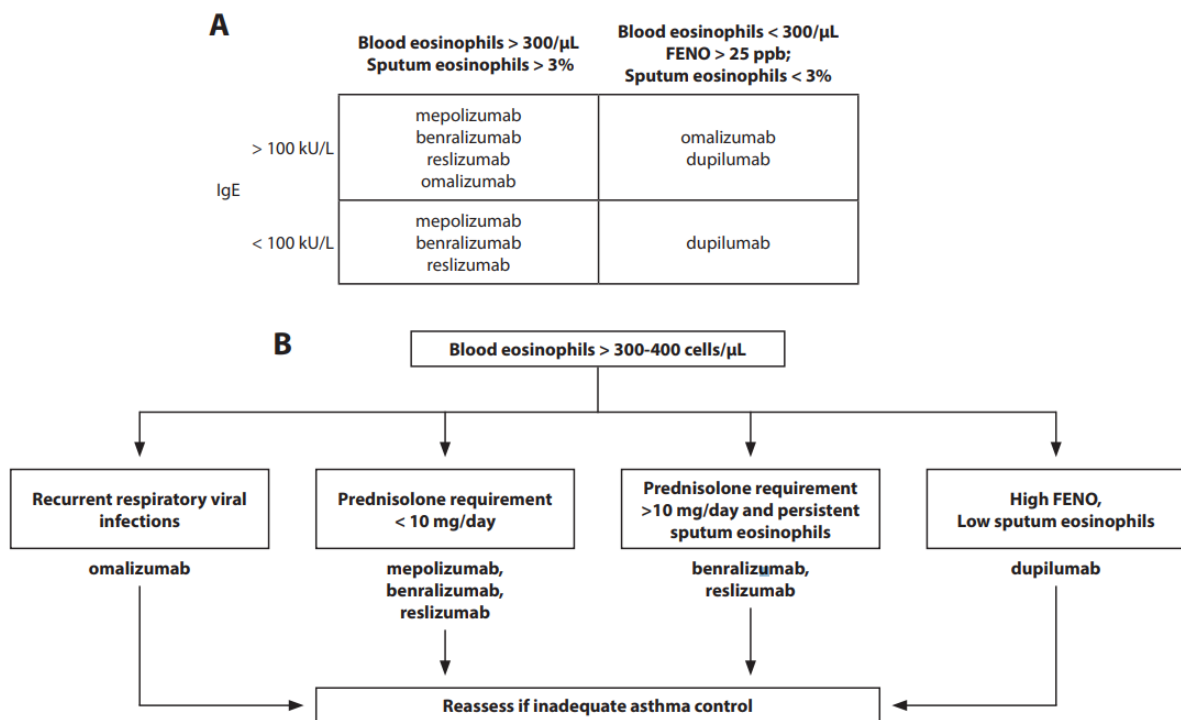
The corresponding author, Dr. Tak LEE, Director of Allergy Centre and Specialist in Immunology & Allergy, Hong Kong Sanatorium & Hospital said, "In the past decades, many of the key molecules and pathways triggering allergic inflammation have been identified. These discoveries have allowed the development of new biologics for treating allergic disorders. The scientific elegance of this major advance is that the final inflammatory pathways responsible for causing the disease are often similar for many allergic disorders and may even be the same for diseases for which allergens cannot be identified, such as non-allergic asthma or recurrent nasal polyposis. The use of mAbs is an allergen-independent strategy as they are not directed at any specific allergen, so they are complementary to allergen-specific strategies such as AIT."

Dr. LEE continued, "Biologics can establish long-lasting and rapid effectiveness: patients often show significant improvement after one or two injections and the effectiveness can be maintained for months (maybe even longer) after a course of treatment. In addition, biologics are disease modifying and fundamentally re-balances the immune system, therefore lowering the severity of the disease even if it relapses."



There are currently five common biologics used to treat allergic diseases, namely dupilumab, omalizumab, mepolizumab, reslizumab and benralizumab. Some of them target the same molecule, such as mepolizumab, reslizumab and benralizumab that target IL-5, while others, such as omalizumab (anti-IgE) and dupilumab, are distinct. Dupilumab is a receptor antagonist and binds to the interleukin-4 (IL-4) receptor, thereby blocking the signaling pathways for both IL-4 and IL-13. As a result, the inflammatory and immunological responses are inhibited in conditions including asthma, eczema, rhinitis and recurrent nasal polyps. In some patients, their nasal polyps shrink or disappear without requiring surgery.

“As several biologics are now available to treat allergic diseases, for example asthma, it can be difficult to know which drug to use for any individual patient. An objective framework, therefore, has been proposed to facilitate the selection by medical practitioners of the best biological treatment(s) for asthma based on a patient’s peripheral eosinophil count, fractional exhaled nitric oxide (FENO), quantitative induced sputum cytometry and total IgE concentrations.” **Dr. LEE** added. Most of these tests are routinely available in any laboratory, but while induced sputum cytometry for asthma has been used in other countries, such as Canada, Australia and UK, it has not been available in HK. HKSH’s Allergy Centre with the help from the Department of Pathology at the hospital is the first to establish the technique in Hong Kong.



Proposed framework for selecting a biological treatment for asthma based on (A) peripheral eosinophil count, FENO, induced sputum cytometry and total IgE concentrations. (B) blood eosinophils, FENO and prednisolone dosage.

The research article *Review of monoclonal antibody therapies in asthma and allergic diseases - a new paradigm for precision medicine* was published in the *Asian Pacific Journal of Allergy and Immunology* Volume 38 Number 2 June 2020.

<https://apjai-journal.org/wp-content/uploads/2020/06/2-AP-020220-0752-Review-Article.pdf>



Patient Case Sharing

Case 1

Mr. WONG, a 39 years old patient who suffered from severe rhinitis with recurrent nasal polyps and asthma for several years, showed a marked improvement after biologic treatment. Mr. WONG did not have any allergic disease history but lost his sense of smell and taste suddenly in mid-2019. He consulted doctors and his CT scan showed extensive bilateral nasal polyps filling his sinuses. He was prescribed nasal and oral steroids, but without improvement. Mr. WONG was referred to HKSH's Allergy Centre and in May 2020, accepted Dr. LEE's recommendation to start dupilumab injection treatment once every two weeks for 3 months. After only the first injection, Mr. WONG recovered his sense of smell and taste. Following 3 months of treatment his rhinitis and asthma had both improved and his nasal polyps had virtually disappeared.

Case 2

Mr. HO is a 66 years old patient with a long history of asthma rhinitis and aspirin allergy. He suffered from increasing severity of asthma since 2017 and his quality of life was severely affected. He coughed uncontrollably, especially in an air-conditioned area, which made him feel embarrassed in the work place. His sleep was disturbed. Mr. HO's other symptoms included shortness of breath, hoarseness, sneezing with yellow discharge and he had poor lung function.

Mr. HO had consulted an ENT specialist who found that his nasal cavity was packed with multiple polyps. The polyps not only obstructed his breathing but also caused him to lose his sense of smell. Mr. HO is a gourmet enjoying good wine and good food so the loss of his sense of smell and taste deeply troubled him and seemingly losing his "joy of life". Although the extensive polyps could be removed by surgery, this would only provide temporary relief with a certain likelihood of recurrence, so it was not recommended. Mr. HO also tried Chinese medicine, acupuncture and moxibustion, but they all failed.

Nasal and oral steroids were prescribed which helped, but steroids could be used for short term only because of potential side effects. As no allergen causing his disease was identified, desensitisation was not an option. Mr. HO was then referred to Dr. Tak LEE and he was started on biologics therapy in 2018. The first biologic (mepolizumab) he used was effective but the improvement was not sustained after a few months. As he had a low IgE and an eosinophil count $<300/\mu\text{L}$, he was switched to dupilumab. After only his first injection of the drug, his condition improved significantly and his sense of smell returned. Mr. HO is now receiving his dupilumab treatment every 3 weeks and his improvement has been sustained for 14 months. His quality of life is immensely better and there have been no side effects from the treatment. His other medications have been reduced and his nasal polyps have disappeared.



HKSH Medical Group

Officially launched in September 2017, promotes public health and advanced medicine through a multi-faceted, coordinated approach in clinical services, medical education, scientific research and public health education. Members of the Group, including Hong Kong Sanatorium & Hospital, HKSH Healthcare HKSH Eastern Medical Centre, are dedicated to offering top-quality holistic care to patients, upholding the motto “Quality in Service, Excellence in Care”.

Hong Kong Sanatorium & Hospital

Hong Kong Sanatorium & Hospital is one of the leading private hospitals in Hong Kong. With the motto “Quality in Service Excellence in Care”, the Hospital is committed to serving the public as well as promoting medical education and research.

Allergy Centre

The Allergy Centre at Hong Kong Sanatorium & Hospital was established in March 2012. It was the first time such a Centre had been created in a private and public hospital in Hong Kong. The Centre provides a patient-orientated, comprehensive, holistic and multi-professional clinical service of excellence. It educates the profession and allied health professionals about allergies. It engages the public and undertakes clinical research.

The Centre sees patients with any allergy or related problems

- Allergic conjunctivitis
- Allergic rhinitis
- Anaphylaxis
- Asthma
- Bronchopulmonary aspergillosis
- Drug allergy
- Eosinophilic disorders, including eosinophilic gastroenteritis / oesophagitis
- Food allergy
- Hives, eczema, angioedema
- Hypersensitivity pneumonitis
- Insect allergy
- Oral allergy syndrome

Tel: 2835 8430

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Photo:

1. Dr. Tak LEE said biologics are allergen-independent treatments which are often effective for several allergic diseases, with long-lasting and rapid effectiveness.



2. Dr. Tak LEE (left) was providing medical consultation to Mr. WONG (right). Seeing Mr. WONG's severe rhinitis with nasal polyps and asthma, Dr. Lee suggested for him to be treated with injections of a biologic.





3. Mr. WONG is seen in this photo receiving his biologic injection (dupilumab). He showed great improvement after only his first injection.



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