CALL FOR ACTION ON REDEFINING ASTHMA

This report is a call for action to all clinicians, researchers and stakeholders to introduce a new revolutionary way of how to think about asthma and to redefine this disease in a way that challenges traditional principles and current guidelines.

The aim of the report is to introduce transformational thinking of asthma, that it is no longer a fixed disease term, to recognise underlying traits that are identifiable, measurable and treatable, and to adopt precision medicine approach to manage asthma in a broader context.

This revolutionary redefinition of asthma will enable real progress in tackling this disease. Moreover, this approach could be generalisable to all airway diseases including chronic obstructive pulmonary disease (COPD).

RE-THINKING OF THE ONE-SIZE-FITS-ALL APPROACH TOWARDS PRECISION MEDICINE FOR CHRONIC AIRWAY DISEASES

When considering asthma, treatment clinicians usually focus on established asthma, rather than the fundamental underlying causes. This approach has set the agenda for asthma as a chronic airway disease that should be controlled rather than cured. The commissioners call for a fundamental rethink of the current guidelines for asthma with greater emphasis on traits that can be measured and treated and less emphasis on arbitrary disease labels.

Therefore, airways diseases should be deconstructed into traits that can be measured and, in some cases, modified, and which are set in the context of social and environmental factors and extra-pulmonary co-morbidities.

As the phenotypic heterogeneity of asthma could be explained by discrete mechanistic pathways or endotypes, a reductionist approach, which focuses on traits that are recognizable, linked to morbidity, and associated with treatment response might represent a better conceptual framework to accelerate progress towards personalized treatments.

In the short term, commissioners advise researchers to focus on these treatable traits while searching for mechanistic underpinning of different disease traits:

**Airflow limitation**

Airflow limitation represents a treatable trait if due to factors such as repeated airway smooth muscle contraction, inflammatory oedema and/or emphysema. Multiple additional and potentially more treatable factors are likely to contribute to airflow limitation.

**Airway inflammation**

Airway inflammation is another treatable trait which is remarkably heterogeneous among patients with a label of asthma or COPD. Eosinophilic and neutrophilic airway inflammation is an important recognizable and treatable pattern of airway diseases.

**Airway infection and impaired airway defences**

Airway infection and impaired airway defences result also in serious clinical consequences such as asthma attacks and COPD exacerbations. Both viral and bacterial infection are candidate treatable traits in patient with airway diseases.

**Altered cough reflex sensitivity and efficacy**

Cough is an important airway defence mechanism present in patients with airway disease. Altered cough reflex recognizable and quantifiable and thus represents an important area for new research and for new drug development.

These traits have the merits of being linked to morbidity and some are reasonably defined, measurable and linked to specific treatment response.

This concept recognizes the clinical and biological complexity of airway disease and acknowledges that both clinical phenotypes and endotypes can occur in isolation or in combination in any patient and might change over time, either as part of their natural history of the disease or because of therapy.

**Practice should move towards a more precise and clinically useful approach that uses only the term chronic airway disease and describes the particular treatable traits present in a particular individual.**
NEW INSIGHTS ON AIRFLOW LIMITATION

The diagnosis of airway diseases is currently based on characteristic symptom patterns and on lung function testing such as spirometry. Although available in all clinical settings and easy to perform, spirometry does not explain the underlying pathophysiology of airflow limitation and is not sensitive enough to detect early changes in small airways.

Therefore, current diagnosis approaches for asthma do a poor job at identifying patients who are at high risk for serious outcomes. Moreover, it does not consider novel genetic, molecular or imaging information despite cumulative evidence of the rapidly evolving field of thoracic imaging in the clinical management of patients with asthma or COPD.

COULD V/Q SPECT/CT WITH TECHNEGAS PLAY A ROLE IN CHRONIC AIRWAY DISEASES MANAGEMENT?

New imaging techniques might provide new and clinically important information about mechanisms leading to airway limitation or about focal areas of the airways particularly suited for targeted treatment.

**VIQ SPECT** is a nuclear medicine investigation that gives a three-dimensional functional map of the lung ventilation and perfusion which are both impaired in airway diseases. This imaging modality has the potential to detect early functional airway abnormalities that precede FEV1 decline. It provides regional information about the airways of the lung which has been demonstrated to complement conventional pulmonary function testing.

Combined with low-dose CT, the ventilation and perfusion distribution measurements are more accurate in physiological correlation. Hybrid VIQ SPECT/CT has the unique ability to measure pulmonary physiology to identify comorbidities and to provide accurate topographic information that is important to elucidate diseases processes.

**Technegas**, an unique ventilation radiotracer, appears to be fixed to the airways and alveoli after inhalation and kept static for at least 20 minutes which does not required lying in the camera room for the inhalation. Technegas can therefore be administrated in the same upright posture as conventional pulmonary tests are performed in and imaged supine. Technegas is widely available, and apart from the mimute risks associated with exposure to low dose of ionising radiation, is readily performed in most tertiary referral environment. Technegas is the preferred ventilation agent as it is clearly superior in patients with obstructive lung disease because of its better peripheral penetration.

MEASURABLE

Quantification of ventilation pattern in airway diseases as a support to clarify the symptoms of the patients and categorize the severity of diseases.

TREATABLE

Regional quantification of lung ventilation as a support to target specific lung segments for precision medicine and to assess response to treatments.

References:

For more information, please visit www.cyclopharm.com.au
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