



Book Review

Implementing precision medicine in best practices of chronic airway diseases, 1st ed., I. Agache, P. Hellings, editors (Academic Press, London) 2019. 228 pages. Price: Not mentioned.

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Asthma has been defined as a disease with several phenotypes and endotypes. Grouping all asthmatics under one umbrella may affect the reproducibility of results in various clinical trials and may miss specific phenotypes where the drug may actually be beneficial. This is a timely book with chapters written by renowned experts in the field of respiratory medicine and allergy.

The book has six sections. Part I deals with the concept of precision medicine and health and has five chapters. The introductory chapter deals with the definition and goals of precision medicine, which helps tailor diagnostic, therapeutic and preventive strategies to each individual patient. Available data from genes, their expression, environment and lifestyles need to be incorporated to successfully achieve this goal. The second chapter deals with the role of genetics including microRNAs and epigenetics mainly for chronic rhinosinusitis (CRS) and cystic fibrosis. Various gene polymorphisms for CRS, staphylococcal carriage and clinical use of genetics in CRS have been dealt with. These are important for asthma, but have not been discussed in this book. The third chapter deals with microbiome, its evolution, host-microbiome interactions and their role in precision medicine. Microbiome in relation to asthma, rhinitis and CRS has been briefly touched upon, and more details would have been useful. The fourth chapter deals with the various factors modulating disease endotype such as immune network, metabolic and endocrine pathways, epigenetic influences and the role of the exposome briefly. The fifth chapter deals with suggestions for a revised nomenclature for disease endotypes.

Part II deals with shortcomings of the current care pathways for chronic respiratory diseases (CRDs)

and the global burden of CRDs. The prevalence and mortality of CRDs and the action taken by various stakeholders such as World Health Organization-Global Alliance against Chronic Respiratory Diseases (GARD), European Union and European Forum for Research and Education in Allergy and Airway Diseases (EUFOREA) have been discussed in the sixth chapter. The next chapter deals with the unmet needs in chronic respiratory tract diseases.

The largest section (Section III) is devoted to personalized care and the first three chapters in this section deal with endotype-driven treatment approaches for asthma, CRS and rhinitis. Various phenotypes and endotypes, their definition and classification and some treatment approaches have been touched upon. The next three chapters deal with the prevention of allergies, asthma and CRS. These chapters briefly discuss the primary, secondary and tertiary levels of prevention, risk and protective factors, do's and don'ts of allergy prevention, dietary measures, role of vitamin D, environmental control, pharmacological intervention for primary prevention and optimizing the outcome of surgical intervention in CRS.

The next chapter deals with the current and future biomarkers for allergy and asthma indicative of lower Th1 immunity such as interferons, interleukin (IL)-12, IL-15 and markers of Th2 activation (such as CCL17, CCL22 and ECP). Other biomarkers for therapy response and nasal biomarkers as a surrogate for lung-derived markers have also been briefly described. The 15th chapter deals with the validation, qualification of biomarkers and their clinical utility. The development of biomarkers to achieve a precision approach to asthma includes developing a point-of-care diagnostics that will help identify the phenotype, endotype and the treatable traits (the PET approach). Some important phenotypes described so far have been briefly dealt with: Th2-high phenotypes (early-onset, allergic, Th2-high asthma,

late-onset refractory eosinophilic asthma and allergic bronchopulmonary mycosis) and Th2-low phenotypes (neutrophilic asthma and extensively remodeled asthma). Serum, sputum and exhaled breath biomarkers have been additionally discussed briefly. The next chapter deals briefly with the key issues for the endotype and biomarker approach. The 17th chapter is well illustrated and discusses the key points for moving forward in the endotype field such as, how does a clinician understand phenotypes and endotypes, how does one define these in allergic diseases, various complex pathways in allergic inflammation and type 2 endotype complex and non-type 2 endotype complexes and technological advances in precision medicine and precision health.

Section IV with three chapters deals with health information technology (HIT) and precision medicine: the role of telemedicine and mobile health technology, how these have evolved over time, how these can be used to offer better management to patients, telemedicine facilitated interventions, mobile health apps as well as the limitations for the use of these health devices, which is equally important to understand. The next chapter deals with the real-time clinical decision support at point-of-care, how to organize the clinical decision-making algorithms and the key components of the clinical decision support systems. Important clinical examples are also discussed along with the illustration of the MACVIA (MALadies Chroniques pour un Vieillessement Actif) clinical algorithm as well as the allergy diary app by MACVIA-ARIA.

The 20th chapter deals with patient-friendly HIT tools with big data from patient and genome registries, pharmacy and medical claims, electronic and healthcare provider software and strengths and limitations of crowdsourcing and crowdsensing of clinical trials that have the potential to revolutionize medical care.

Section V deals with the patient-centered decision systems and interpersonal dimensions of personalized medicine for chronic obstructive pulmonary disease. The last section with seven chapters deals with bringing precision medicine to the clinic. How to use big data for developing clinical decision algorithms and various funding opportunities from the European Union, Finland, EUFOREA and other multidisciplinary networks.

Overall, the book is easy to read, well referenced, some chapters are illustrated with tables and figures and give good insight to the reader about precision medicine in the field of chronic airway diseases. All the chapters are mainly brief overviews, none dealing with the subject in depth and the interested reader needs to delve into the references to gain a deeper understanding.

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