Keywords: Asthma; Biomarkers; FeNO; Eosinophils; Periostin; Exacerbations; Treatment response

Introduction

Asthma is a chronic respiratory condition a ecting millions peutic

Biomarkers in asthma diagnosis

Traditionally, asthma diagnosis relies on clinical symptoms, lung

Predicting asthma exacerbations

One of the major challenges in asthma management is predicting

in asthma control. A systematic literature search was performed using databases such as PubMed, Google Scholar, and Web of Science [8]. e search included studies published in English between 2010 and 2022.

Inclusion and exclusion criteria

Studies were included if they were published in peer-reviewed journals, focused on human subjects with asthma, and provided insights into biomarkers related to asthma control. Exclusion criteria encompassed non-full-text availability, animal or in vitro studies, and non-English publications.

Data extraction

Data from selected studies were extracted using a standardized form, capturing study design, biomarkers investigated, key ndings related to asthma control, and limitations .

Biomarkers of Interest

e review focused on key biomarkers associated with asthma control, including Fractional exhaled nitric oxide (FeNO), blood eosinophil counts, and periostin, among others.

Data analysis

Descriptive statistics were used to summarize the ndings. Meta-analyses or systematic reviews were consulted where applicable to strengthen the evidence [9,10].

Quality assessment

e quality of studies was assessed using the Newcastle-Ottawa Scale for observational studies and the Cochrane Risk of Bias Tool for randomized controlled trials.

Limitations

Limitations include potential publication bias, variability in study methodologies, and di erences in patient populations.

Ethical considerations

Ethical approval was not required as this review is based on published data from publicly available sources. By employing these materials and methods, this mini-review aims to provide a rigorous exploration of biomarkers in asthma control, o ering valuable insights for future research and clinical practice.

Results

Biomarkers in asthma diagnosis

Several biomarkers have shown promise in aiding asthma diagnosis. Fractional exhaled nitric oxide (FeNO) and blood eosinophil counts have emerged as valuable indicators of eosinophilic in ammation, a subtype of asthma o en responsive to corticosteroids.

Predicting asthma exacerbations

Biomarkers such as periostin and blood eosinophil counts have been linked to an increased risk of asthma exacerbations. Elevated levels of these biomarkers can help identify patients at higher risk, allowing for timely interventions to prevent severe attacks.

Personalizing asthma treatment

e role of biomarkers in guiding personalized asthma treatment is increasingly recognized. Patients with high eosinophil counts may bene t from anti-in ammatory medications like corticosteroids, while those with low eosinophil levels might require alternative treatments.

Monitoring treatment response

Monitoring biomarkers can help assess the e ectiveness of asthma treatments. A decline in FeNO levels or eosinophil counts following treatment initiation may indicate a positive response, whereas persistent elevation could suggest the need for dose adjustment or alternative therapies.

Other potential biomarkers

Apart from the well-established biomarkers, emerging research

biomarkers, exploring new potential indicators, and integrating biomarkers into comprehensive asthma management algorithms. Collaboration between researchers, clinicians, and industry stakeholders is crucial to overcoming existing challenges and advancing the eld.

Conclusion

In conclusion, biomarkers hold immense promise for unlocking better asthma control by providing valuable insights into disease pathophysiology, guiding personalized treatment decisions, and monitoring treatment response. While challenges exist, ongoing research and technological advancements o er opportunities to overcome these hurdles. By embracing the potential of biomarkers and addressing the associated challenges, healthcare providers can move closer to achieving personalized, targeted asthma management, ultimately leading to better outcomes and improved quality of life for asthma patients. e integration of biomarkers into clinical practice represents a signi cant step forward in the quest for optimal asthma control.

References

1. Fox SE, Akmatbekov A, Harbert JL, Li G, Brown JQ, et al. (2020) Pulmonary and cardiac pathology in African American patients with COVID-19: an autopsy series from New Orleans. Lancet Respir Med 8: 681-686.
2. Magadum A, Kishore R (2020) Cardiovascular manifestations of COVID-19 infection. Cells 19: 2508.
3. Yang J, Tian C, Chen Y, Zhu C, Chi H, et al. (2021)