



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكرو فيلم



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التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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MONA MAGHRABY

Value of Peripheral Blood Eosinophil Markers to Predict Severity of Asthma

Thesis

Partial Fulfillment of Master Degree
in Chest Diseases

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ مَوْلَا

سَبِّحَانِكَ لَا تَعْلَمُ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

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List of Abbreviations

<i>Abbrev.</i>	<i>Full-term</i>
BMI	: Body mass index
CBC	: Complete blood count
CFC	: Chlorofluorocarbon propellant
COPD	: Chronic obstructive pulmonary disease
CT	: Computed tomography
DPI	: Dry powder inhaler
FENO	: Fractional concentration of exhaled nitric oxide
FEV I	: Expiratory volume in one second
FVC	: Forced vital capacity
GERD	: Gastroesophageal reflux disease
HFA	: Hydrofluoroalkane propellant
ICS	: Inhaled corticosteroids
IL	: Interleukin
LABA	: Long-acting beta2-agonist
LTRA	: Leukotriene receptor antagonists
MRI	: Magnetic resonance imaging
OCS	: Oral corticosteroids
PEF	: Peak expiratory flow
pMDI	: Pressurised metered-dose inhaler
SABA	: Short-acting beta2-agonist
SD	: Standard deviation
sIgE	: Specific immunoglobulin E
SPSS	: Statistical package for social science
Th	: T-helper
E	: Eosinophils

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Introduction

Asthma is an inflammatory disorder of the airways and one of the most common chronic diseases in industrialized countries. Despite the availability of a myriad of oral and inhaled asthma medications, the prevalence of asthma and its associated mortality continue to increase. Asthma is also associated with significant morbidity, often affecting the Patient's normal daily activities, disturbing normal sleep patterns and potentially reducing quality of life (*Korenblat et al., 2018*).

Patients with poorly controlled asthma present a medical challenge that remains far too prevalent, and this may be partially related to suboptimal treatment strategies and poor patient compliance with drug therapy. Current treatment guidelines. With a few exceptions, such as parenterally administered aminophylline and salbutamol (albuterol), most drugs used in the treatment of patients with asthma are administered orally or by inhalation. This article reviews the positive and negative aspects of oral and inhaled asthma medications, including issues relating to patient compliance, pharmacokinetic properties, clinical efficacy, tolerability and the use of these medications in combination (*Hall et al., 2015*).

Although asthma cannot be cured, the severity of the disease can be reduced with long term anti-inflammatory therapy. Compliance with long term therapeutic regimens is difficult and, as indicated in another paper in this supplement, is affected by a number of factors, including the frequency and ease of drug administration as well as adverse events. Obviously, patient compliance with therapy for any chronic disease such as diabetes mellitus or hypertension is important; however, compliance with asthma therapy has the added dimension that treatment frequently includes the use of inhalers, which are relatively complicated devices and which many patients (especially children and the elderly) find difficult to use (*Normansell et al., 2016*).

Indeed, it has been shown that the great majority of elderly patients cannot use inhalers properly, despite adequate instruction. The most widely used aerosol delivery system is the pressurised metered-dose inhaler (pMDI), although the use of dry powder inhalers has increased in recent years. Efficient delivery of drug to the lungs by pMDI requires correct positioning of the inhaler, a slow inspiratory flow rate, the synchronisation of canister actuation with inhalation, and holding of the breath (for about 5 to 10 seconds) at the end of inspiration. Various errors can occur with pMDI use, such as incorrect timing of actuation, poor inhalation technique can affect the amount of drug reaching

the lungs and response to therapy. For example, slow inhalation (30 Umin) of terbutaline sulfate, administered by pMDI, achieved a greater increase in forced expiratory volume in one second (FEV₁) than fast inhalation (90 Umin). Consequently, patients may become noncompliant with therapy because of difficulty using the inhaler or because the treatment is perceived as not being effective. Various spacer devices and valved holding chambers are available to improve or simplify inhalation technique with pMDIs, although they do not eliminate the need for correct inhalation technique. Some patients, particularly adolescents, may not wish to use such a device (especially in public places). Another potentially useful device is the breath-activated pressurised inhaler (Autohaler®), which avoids the need to coordinate aerosol discharge with inhalation) (*Bateman et al., 2017*).

Similarly, dry powder inhalers are designed to release the medication powder on inhalation, but require a relatively high inspiratory flow rate to release a full dose. As a result, dry powder inhalers are probably more suitable for maintenance therapy than for rescue from severe asthma exacerbations (when patients have decreased airflow (*Nguyen and Ulrik, 2016*).

Aim of the Study

The aim of this work is to assess the relationship between the level of peripheral blood eosinophil and severity of asthma. Also to assess the correlation between blood eosinophil level and use of corticosteroids.

Asthma Definition

Asthma is a common, chronic respiratory disease affecting 1-18% of the population in different countries. Asthma is characterized by variable symptoms of wheeze, shortness of breath, chest tightness and/or cough, and by variable expiratory airflow limitation. Both symptoms and airflow limitation characteristically vary over time and in intensity (*de Groot et al., 2015*).

The three main processes responsible for the clinical features of asthma are well recognized:

- Bronchoconstriction,
- Mucus hypersecretion,
- And airway inflammation.

However, the underlying pathophysiology responsible for these processes is complex and nuanced, involving multiple cell types and cytokines (*Lambrecht and Hammad, 2015*). Furthermore, the activity and clinical impact of each cellular and subcellular component varies considerably between individuals and can change over time, as well as in response to drug therapy and environmental/lifestyle influences (*McBrien and, Menzies-Gow, 2017*).

These variations are often triggered by factors such as exercise, allergen or irritant exposure, change in weather, or