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ملاحظات:
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Prevalence of Work related Asthma among Adult Workers in Multicenter Farms in Great Cairo, Egypt

Thesis

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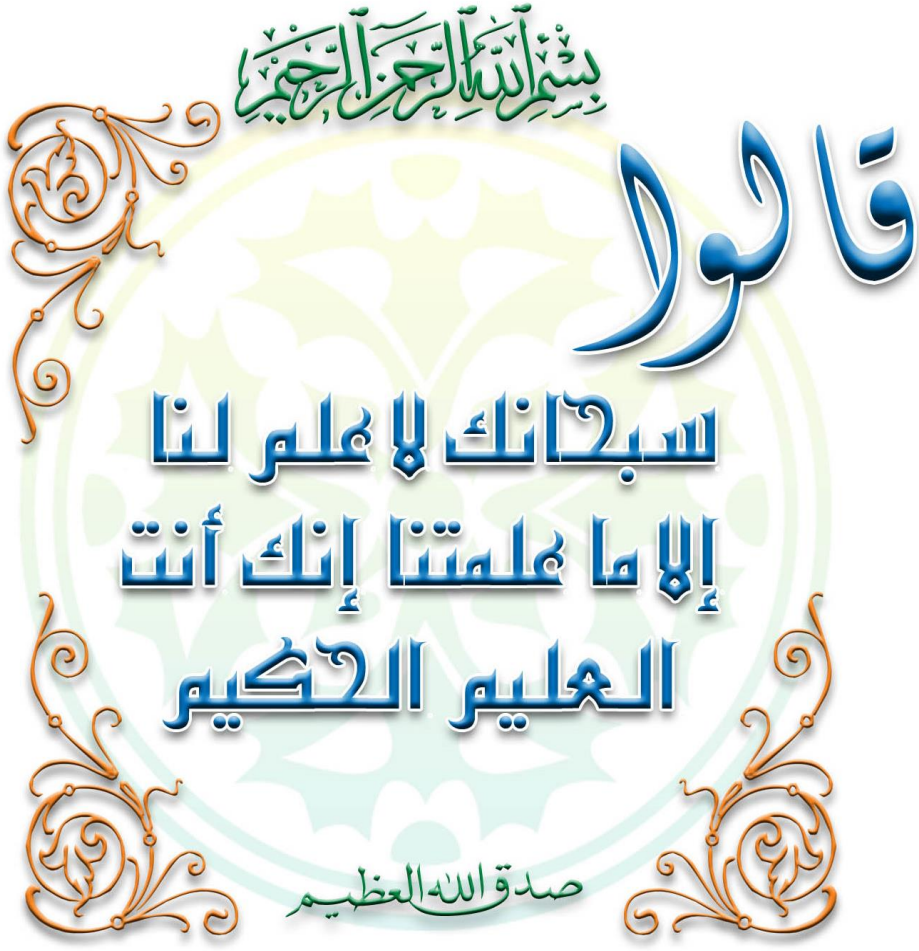

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List of Abbreviations

Abb.	Full term
ACCP	American College of Chest Physicians
ACOAM	American College of Occupational and Environmental Meidicne
ACT	Asthma Control Test
AHR	Airway hyperresponsiveness
AIT	Allergen immunotherapy
Anti-IgE	Anti-immunoglobulin E
BD	Positive bronchodilator
BDP	Beclomethasone dipropionate
ECP	Eosinophil cationic protein
ERS	European society taskforce
GERD	Gastroesophageal reflux
GM-CSF	Granulocyte-macrophage colony-stimulating factor
HMW	High molecular weight
ICS	Inhaled corticosteroids
IgE	Immunoglobulin E
IIA	Irritant induced asthma
IL	Interleukin
LAMA	Long-acting muscarinic antagonists
LMW	Low molecular weight
MART	Maintenance and reliever therapy
MSDSs	Material safety data sheets
NSBH	Nonspecific bronchial hyperresponsiveness
OA	Occupational asthma
TDI	Toluene diisocyanate
PEF	Peak expiratory flow
RADS	Reactive airway dysfunction syndrome
SIC	Specific inhalation challenge tests
SLIT	Sublingual allergen immunotherapy
SPT	Skin prick test
TSLP	Thymic stromal lymphopoietin
WEA	Work-exacerbated asthma
WRA	Work-related asthma

INTRODUCTION

Work related asthma is divided into occupational asthma and work exacerbated asthma. Occupational asthma (OA) is defined as asthma initiated by workplace exposures, either by sensitization to a specific substance (sensitizer-induced OA) or by exposure to an inhaled irritant at work (irritant-induced OA) ***(Bernstein et al., 1999).*** Work exacerbated asthma is defined by exacerbation of already present asthma (not initiated) by work–related factors.

Occupational exposures are responsible for approximately 9–25% of all adult onset asthma cases ***(Nicholson et al., 2005; Tarlo et al., 2008; Henneberger et al., 2011; Malo et al., 2011; Dotson et al., 2015).*** These diseases can adversely affect an individual's health and capacity to perform at work, resulting in significant economic losses.

Immunologic/allergic OA or OA with latency, or sensitizer-induced OA, is the initiation of asthma caused by immunological sensitization to a specific substance at work (i.e., high-molecular-weight proteins or low-molecular- weight chemicals) ***(Bernstein et al., 2006).*** Occupational asthma due to sensitizers occurs with a latency period [the period between the beginning of exposure and the onset of symptoms] ranging from weeks to years. The latency period is typically within 2 years for LMW sensitizers, such as isocyanates and plicatic acid, and for some high molecular weight (HMW) sensitizers, such as

laboratory animals and enzymes ***(Corradi et al., 2011),*** while it is slightly longer for most HMW sensitizers, such as flour or latex ***(Cartier and Sastre, 2011).*** Once sensitization is present, the response to work exposures can be immediate (within minutes of such exposure), late, or dual.

Some of the most common allergens are dust particles, fungi/mould, pesticides, animal particles and pollens. Typically, occupational allergens are classified as either HMW >5 kDa, or LMW <5 kDa, and their size is thought to play a significant role in their allergenicity and mechanism of action ***(Stacey et al., 2017).***

In sensitizer-induced OA, avoiding allergen inhalation increases the possibility of improvement or cure, particularly during the first year after onset of symptoms. Early diagnosis and removal from exposure is the most effective way to prevent progression to moderate and severe asthma with the corresponding burden of morbidity and disability ***(de Groene et al., 2011).***

On the other hand, the term Irritant-induced asthma (IIA) has been introduced to characterize the development of asthma symptoms, nonspecific bronchial hyperresponsiveness (NSBH), and airway inflammation induced by irritant mechanisms, as opposed to sensitizer-induced OA caused by immunologic mechanisms leading to specific bronchial hypersensitivity to a workplace agent ***(Nicholson et al., 2005; Tarlo et al., 2008;***

Henneberger et al., 2011; Malo et al., 2011; Dotson et al., 2015), which is classified into;

A. **Acute irritant induced asthma** (Reactive airways disease syndrome, RADS) ***(Brooks et al., 1985).*** This is a fairly well described entity. The diagnosis is retrospective and criteria based, e.g. ACCP criteria for diagnosis of reactive airway dysfunction syndrome (RADS) (should meet all eight) ***(Chan-Yeung, 1995):***

1. Documented absence of preceding respiratory complaints.
2. Onset of symptoms after a single exposure incident or accident.
3. Exposures to a gas, smoke, fume, or vapor with irritant properties present in very high concentration.
4. Onset of symptoms within 24 h after exposure with persistence of symptoms for at least three months.
5. Symptoms simulated asthma: cough, wheeze, dyspnoea.
6. Presence of airflow obstruction on pulmonary function tests (initial testing should be done shortly after exposure).
7. Presence of nonspecific bronchial hyperresponsiveness.
8. Other pulmonary diseases ruled out. Not so sudden onset of irritant asthma. As opposed to RADS this is caused to lower chronic or repetitive exposures to irritants mostly in

the range of the occupational exposure limits, it is commoner in those with atopy or childhood asthma.

B. **Irritant asthma with latency**: ***(Burge et al., 2012)***

This is a controversial entity of asthma defined by:

1. No prior asthma
2. A latent interval from first exposure to disease
3. No massive acute exposure
4. Symptoms related to usual exposure to the causative agent
5. Reproducibility of the asthma from either workplace challenges or specific inhalation challenge or valid serial measurements of PEF measurements at and away from work
6. An allergic mechanism is very unlikely

Work exacerbated asthma. This is characterized by symptomatic deterioration of pre-existing or concomitant non-occupational asthma at work without a latent interval mainly by irritant mechanisms. There are similar changes in lung function related to work exposure as those with allergen or irritant-induced OA ***(Chiry et al., 2007).***

There are few studies detecting prevalence of occupational allergy in Egypt, one study conducted on 120 workers at 2016 to detect the prevalence of work related asthma in flour mills at

south Cairo which revealed that about 25% of mills workers suffer from work related asthma ***(El Gewily et al., 2018).***

Another old study conducted on 1988 detecting the prevalence of work related asthma also among mills workers, which revealed that about 13% of workers had occupational asthma ***(Mohamed et al., 1988).***

So, our study aims to detect the prevalence of work related asthma among adult workers in multicenter farms in great Cairo, Egypt, as previous studies detected only workers in the flour mills.

AIM OF THE WORK

To detect the prevalence of work related asthma (WRA) among Egyptian adult agriculture workers in great Cairo with differentiating between the 3 main categories: work exacerbated asthma, occupational asthma (OA) whether sensitized or irritant induced asthma.