A brief narrative on work-related asthma (WRA)

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ABSTRACT:

Work related asthma (WRA) is caused by exposure at work known as occupational asthma (OA) or exacerbated or aggravated by exposure at workplace known as work-exacerbated asthma (WEA) or work- aggravated asthma (WAA). Worldwide, WRA remains under detected and undermanaged. Failure to detect or treat WRA leads to increased healthcare cost, morbidity and mortality. The diagnostic work-up includes clinical history and detailed occupational history, assessment of the causative agent and the objective measurements. Del Roio LC et al (2020) have developed algorithm for the diagnosis of WRA with three primary diagnostic criteria and five additional criteria. Better knowledge and understanding of clinicians and other healthcare providers about WRA is vital for early consideration of WRA diagnosis among adult patients with asthma. While Optimum awareness of general public about WRA may possibly help in initiating discussion by affected workers with their healthcare service providers. The primary prevention includes reducing the burden of WRA by evading the use of potential sensitizers and restricting their exposure and limiting to workplace asthma triggers when their use cannot be avoided.

Keywords: Asthma, occupational asthma, work-related asthma, work-exacerbated asthma, work-aggravated asthma.

INTRODUCTION

Asthma is one of the common chronic airway diseases, heterogeneous in nature characterized by variable symptoms (wheeze, dyspnea, chest tightness and/or cough) and variable expiratory airflow limitation; both of these vary over time and intensity, often triggered by the factors such as allergen/ irritants, exercise, viral respiratory infection, change in weather. It is commonly associated with airway inflammation and hyper-responsiveness.[1] The estimated 62 million people were living with asthma in 2019 worldwide and 0.5 million deaths occur each year. Globally, asthma remains under-detected and untreated or undermanaged.[2]

Around one fifth cases of asthma in adults are work related. Work related asthma (WRA) is exceedingly prevalent in the adults of productive years of life.[3,4] The term work related asthma (WRA) is used because asthma control is badly affected by the factors, conditions and environment present at workplace.[4]

WORK RELATED ASTHMA (WRA)

WRA is caused by exposure at work called as occupational asthma (OA) or exacerbated or aggravated by exposure at workplace called as work-exacerbated asthma (WEA) or work- aggravated asthma (WAA). From here onward term work-exacerbated asthma (WEA), rather work- aggravated asthma (WAA) will be used.[3] In terms of phenotype, there are three main types of WRA: 1) Persons with Work-exacerbated asthma (WEA), 2) Sensitizer- induced occupational asthma (SIOA) and 3) Irritant-induced occupational asthma (IIOA).[4]

Work-exacerbated asthma (WEA): These persons either have a preexisting asthma or develop adult-onset asthma coincidently that exacerbate/aggravate by non-specific elements present at workplace such as extremes of workplace temperature or humidity, exertion due to labor-intensive work, stressful conditions at workplace, exposure to air pollutants, dust, fumes etc.[4]

Occupational asthma OA is triggered by exposure to airborne elements present in the workplace environment. Hence, it is defined as symptoms pertaining to asthma due to reversible bronchial obstruction or airway hyper-responsiveness attributed to the occupational environment. OA has two phenotypes; OA due to allergic sensitization (Sensitizer-induced occupational asthma, SIOA) and caused by irritants (Irritant-induced occupational asthma, IIOA). SIOA is highly prevalent seen in about 90% of cases than IIOA.[3,4]

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WRA mostly remains undetected and untreated in developing and underdeveloped countries. Failure to detect or treat WRA leads to increased healthcare cost and increased morbidity and mortality.[3,5] Optimal knowledge and understanding of clinicians and other healthcare service providers about WRA is essential for early consideration of WRA diagnosis among adult patients having asthma. Optimum awareness of general public about WRA may possibly initiate dialogue process by the affected workers with their healthcare provider.[5]

A diagnosis of WRA must be thought in adults who develop asthma or exacerbation of preexisting asthma.3) Del Roio LC et al (2020) have developed algorithm for the diagnosis of WRA with three primary diagnostic criteria and five additional criteria.[3]

The primary diagnostic criteria are: A) a diagnosis of asthma; B) onset or worsening/exacerbation of asthma symptoms after entry in the related workplace; and C) an association between symptoms of asthma and work. The five additional criteria are 1) exposure to an agent at workplace recognized to cause asthma; 2) exposure to an agent or conditions at workplace well-known to cause asthma worsening or exacerbation; 3) decline of forced expiratory volume in first second (FEV1), peak expiratory flow (PEF), or a combination of the two, or hyper-responsiveness after nonspecific bronchial challenge testing during periods of work compared to periods away from work; 4) positive response to specific bronchial challenge testing; and 5) onset of asthma symptoms after exposure to irritants.

On the basis of the primary diagnostic criteria and five additional criteria; one of the three diagnoses (OA, Probable OA, WEA) is sorted out. A diagnosis of OA is made if A+B+C are met, together with additional criteria 3, 4, or 5. A probable OA is made if A+B+C are met, together with additional criteria 1. A diagnosis of WEA is made if A+B+C are met, together with a diagnosis of preexisting asthma or concurrent asthma and 2+3 additional criteria or more frequent/more severe asthma attacks, need for medication use, or a combination of the two, with a diagnosis of OA being excluded.[3]

The diagnostic work-up include: 1) clinical history and detailed occupational history and assessment of the causative agent and 2) the objective measurements.[3,6,7] The objective measurements include Serial PEF measurements, Spirometry and nonspecific bronchial challenge testing, Specific bronchial challenge testing, Immunological tests, Inflammatory markers.[3]

It is interesting to note that patient having OA can develop WEA and vice versa.[8] The differential diagnosis of WRA can be COPD, hypersensitivity pneumonitis, bronchitis, eosinophilic bronchiolitis, and vocal cord dysfunction; but it should be kept in mind that these conditions may coexist with patient having asthma.[3,8]

The best effective interventions for the prevention and treatment of WRA are timely diagnosis and thorough removal of exposure to the causative agent. This strategy prevents disease progression. Thorough removal of exposure to the causative agent is advocated for patients having SIOA.[3,8,9]

Persons experiencing WEA are usually adept to keep their works intact after exposure to relevant agents has been controlled/reduced. This can reduce the socioeconomic impact of work absenteeism. In case thorough removal of exposure is not adequate to prevent exacerbation of asthma symptoms, workers must be shuffled to unexposed areas or relocated for other duties.[3]

CONCLUSION

WRA is underdiagnosed and inadequately managed especially in developing and underdeveloped countries. Further, these patients are not satisfactorily compensated for the disease-related losses. Early diagnosis is critical for decreasing the morbidity linked with WRA. The possible approach for early diagnosis comprises of comprehensive knowledge and understanding of WRA among at-risk workers and their primary care providers and the suitable steps to be taken for the correct diagnosis and appropriate management. The primary prevention includes reducing the burden of WRA by evading the use of potential sensitizers and restricting their exposure and limiting to workplace asthma triggers when their use cannot be avoided.

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