CASE REPORT

Occupational Asthma as a Differential Diagnosis of Adult-Onset Asthma – A Case Report

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ABSTRACT

Bronchial asthma causes great morbidity and mortality worldwide. Certain occupations especially those exposed to known triggers of asthma such as animal fur, dusts or solvents may trigger asthma attacks in a previously undiagnosed individual or worsen its' control in a known asthmatic. This is especially true for adult-onset asthma. This may in turn the health of the affected workers and affect their productivity. Affected workers may be given job reassignment and eligible for medical compensation from Social Security Organisation (SOSCO). This case report will look at how two individuals in very distinct occupation were diagnosed with suspected occupational asthma.

Keywords: Occupational asthma, Diagnosis, Quality of life, Compensation

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INTRODUCTION

Work-related asthma can be divided into two categories (1). This includes work-aggravated asthma and occupational asthma, which can be subdivided into reactive airway dysfunction syndrome (RADS) (also known as irritant occupational asthma or occupational asthma without latency), and latency-associated occupational asthma (also known as all allergic occupational asthma) (1).

The mean annual incidence of occupational asthma in developing countries is nine times less than the rates in industrialized countries (2). Occupational asthma is the second most common occupational lung disease in developing countries, after pneumoconioses (2). Occupational asthma may be triggered by a wide variety of noxious substances, including wood and plant dust, latex, dyes, flour and grain dusts, and animal fur. Occupational asthma has severe dire consequences, including worsening employee health status, impairment of work capability and quality of life, and effect on economic related indicators such as excess sick leaves and increase use of health resources (3).

The diagnosis is based on history of exacerbation of symptoms at work, serial peak expiratory flow measurements that is lowest at work and the aid of specific challenge tests if necessary (4). In uncertain cases, a referral to a respiratory or occupational physician is needed to allow early appropriate interventions to be taken (4).

In Malaysia, occupational asthma has been placed as a one of the mandatory notifiable occupational disease by the government due its potential reversibility, consequences if not treated and need for allocation of resources (5). Sirajuddin H et al, reported that just 18 months after notification of occupational diseases was made compulsory by the government, as many as 36 cases of lung related occupational diseases were notified including asthma and pneumoconiosis, infections and inhalation accidents (5).

While research on occupational asthma from local and worldwide perspective has been ongoing since the 1980's, there is still limited information of prevalence of such disease especially in the local scene coupled with serious under-diagnosis, therefore highlighting a knowledge gap and necessity of this publication, where we will present two suspected cases of occupational asthma where further confirmation is needed.

CASE REPORT

Case study 1

A previously well 27-year-old man was noted to have recurrent attacks of wheezing and shortness of the breath for the past three months. Lung auscultation of

this patient usually showed generalized rhonchi during the attacks. This later identified asthma exacerbation will usually abort with emergency treatment of nebulized bronchodilator and a short course of oral steroids. All of his previous 11 visits resulted in him being given nebulization. He has no personal or family history of atopy. He started to work in a pet shop two months prior to the first episode of the wheezing and shortness of breath. Initially presenting with attacks once every two weeks, the frequency of attacks had worsened to two attacks in a week.

He worked six days a week from 8.30 am to 5.30 pm and his symptoms usually occurred two to three hours after coming in to work. Symptoms showed marked improvement when he is not working.

In this case, occupational asthma was suspected based on the presenting clinical features and serial peak expiratory flow measurement which showed dipping during workday and peak at other times (Figure 1). Patient was referred to occupation physicians for workplace risk assessment and possible job reassignment.

Case study 2

A previously well 18-year-old woman was noted to have recurrent attacks of wheezing, cough and shortness of the breath for the past six months. Lung auscultation also showed generalized rhonchi during the presence of the above symptoms. Attacks aborted with emergency nebulization and short course of oral steroids. Her previous six visits all resulted in nebulization. There was no history of atopy in this patient or her family. She started working in a shoe warehouse three month prior to the first episodes of the above symptoms.

She worked five days a week from 9am to 6pm and her symptoms usually occurred if she enters the store in the warehouse which she described as very dusty. Her symptoms also showed marked improvement when she is off duty.

In this second case, occupational asthma was also suspected based on the presenting clinical features and serial peak expiratory flow measurement (PEF) which showed dipping during workday and peak at off days (Figure 2). Patient was also referred to occupation

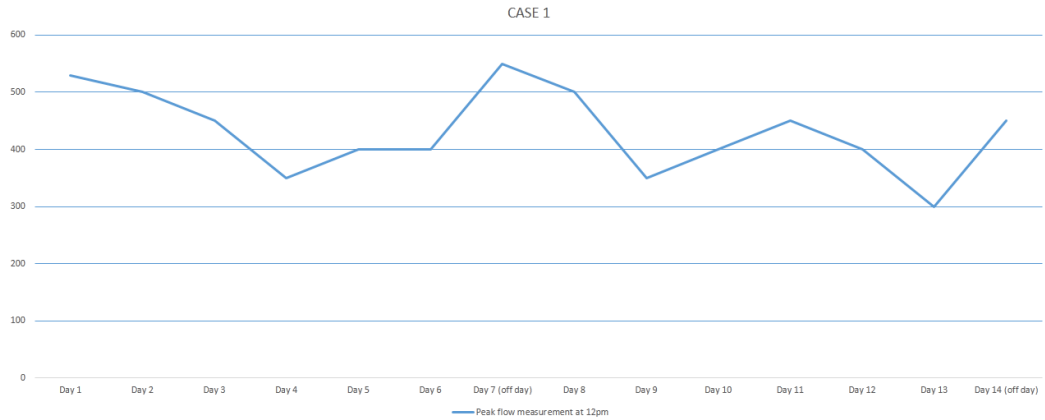

Figure 1: Serial peak expiratory flow rate measurement of Case 1 (Required nebulization at day 4, 9 and 13)

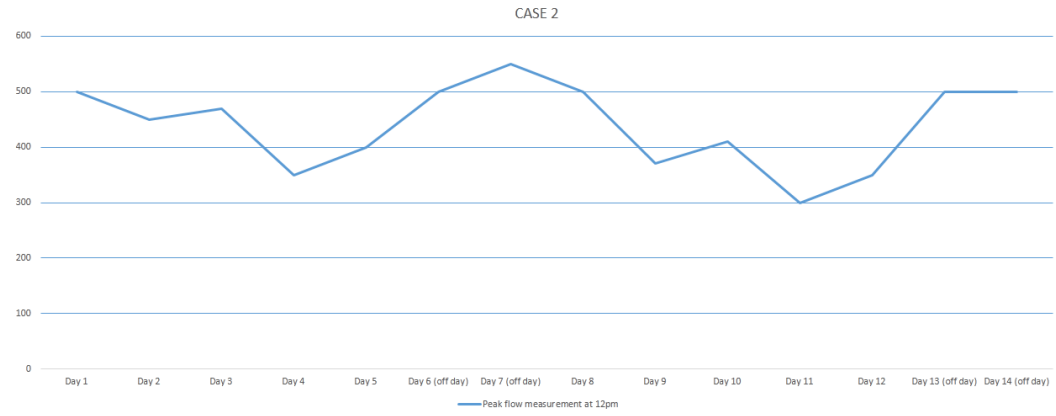

Figure 2: Serial peak expiratory flow rate measurement of Case 2 (Required nebulization at day 4, 9 and 11)

physicians for workplace risk assessment and possible job reassignment.

DISCUSSION

Work related asthma should be considered in all cases presenting primarily as adult-onset asthma. Important elements in diagnosing work-related asthma includes the documented absence of preceding respiratory complaints, onset of symptoms after single or recurrent exposure to known triggers at work, onset of symptoms of asthma within 24 hours and persistence for at least 3 months in the related work environment. According to the latest Malaysian clinical practice guidelines on asthma 2017, diagnosis of occupational asthma is mainly through tying up of classical history of exacerbation at work and remission off work along with serial measurement of PEF that should be conducted at least four readings per day, at and away from work, for a period of at least three weeks and documentation of variability of >20% and confirmation by a respiratory physician or a physician with experience in occupational health. Both these cases were seen before the implementation of this CPG and therefore, future diagnosis of occupational asthma should be based on this evidence-based guideline.

Special investigations available for diagnosis of occupational asthma includes spirometry/ serial peak expiratory flow rate, methacholine challenge test, skin prick tests, serum specific IgE to occupational allergens and special inhalation challenge tests. As shown in Figure 1 and 2, serial peak flow measurements of both these patients shows dipping during working hours and normal levels during holidays and time off work. Methacholine challenge test if done, will show a high level of bronchial hyperactivity, while skin prick tests and serum specific IgE may in turn reveal sensitization to occupational allergen.

The important steps in the management of occupational asthma is correlating the history of exposure and attacks, performing concise physical examination and carrying out relevant investigations. This is then correlated to known triggers at work and risk factors leading to interventions including walkthrough survey in which occupational physicians will survey the workplace and identify any other person at the workplace that have similar issues, identify precipitating agent (irritants or allergens) and undertakes preventive steps including elimination or substitution of harmful allergens. Certain cases will need, modification of engineering measures including machines and procedures; and administrative measures including enforcing changes in job description or working hours of the affected worker to reduce exposure to the sensitizing agent. However, for both these cases, as the workplace hazards i.e. dust and animal fur is still present, the ideal intervention will be reassignment to another job scope that prevent exposure to these hazards.

Those employees having occupational diseases may be eligible for compensation from Social Security Organisation (SOCSO) as long they are registered with SOCSO. These include medical benefits which includes free medical treatment at government health facilities and SOCSO panel clinics as well as temporary disablement benefits as long as these employees are given medical leave not less than four days.

CONCLUSION

The diagnosis of work related asthma are frequently missed or delayed. Therefore, complete history, examination and confirmatory investigations will go a long way towards diagnosing this important occupational disease.

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