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Prevalence of Asthma & Allergy in Hong Kong Athletes

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Introduction

Allergy and asthma affect a few hundred million people globally. The global asthma burden has risen over the past few decades [1]. The prevalence of asthma symptoms is higher in urban compared with rural communities. Higher prevalence of asthma was found in western developed countries, such as Canada (14.1%) and USA (10.9%) [2]. However, a recent study has reported that the prevalence of asthma is increasing in Asia while the prevalence has stabilized in the West [3]. Previous studies have reported a higher prevalence of asthma in elite athletes [4-5]. However, a study of elite athletes in Queensland did not show a significant difference between the prevalence of asthma among athletes and the general population [6].

Food, drug and environmental allergies are other allergic disorders that affect all age groups. Food allergy is fairly common in Western countries and it has been reported to occur with increasing trend in many parts of Asia [7]. The patterns of food allergy are different between Asian and Western countries. Unique food allergy may be observed in Asia due to the different cultures and eating habits [8]. However, there is a paucity of studies on asthma and allergies in Hong Kong athletes.

Purpose

The purpose of this study was to investigate the prevalence of asthma and allergies in Hong Kong athletes.

Methodology

The data collected in the study were obtained from the 2012-2013 Hong Kong Sports Institute annual medical screening of 752 athletes (Male = 453, Female = 299) from 25 different sports. Allergies (food, drug & environment) and asthma were identified using self-reported questionnaire completed by athletes.

Results and Discussion

Table 1 and Table 2 stated the prevalence of allergies (food, drug & environment) and asthma in athletes. About 7% and 1.5% athletes reported allergies and asthma respectively. Food allergy was the most common type of allergies among athletes, followed by drug allergy.

Table 1. Prevalence of allergies (food, drug & environmental) in athletes

	n	% of those with allergic reaction	Prevalence (%) in total population (n=752)
Food	29		3.86
Seafood	11	37.9	1.46
Beef	4	13.8	0.53
Peanuts	4	13.8	0.53
Tree nuts (nuts and almond)	3	10.3	0.40
Alcohol	3	10.3	0.40
Egg / egg white	2	6.9	0.27
Kiwi	2	6.9	0.27
Other food^	4	13.8	0.53
Reacted to ≥ 1 type of foods	2	6.9	0.27
Drug	22		2.93
Antibiotics	12	54.6	1.60
NSAID	4	18.2	0.53
Analgesic drug	3	13.6	0.40
Others#	4	18.2	0.53
Environmental	5		0.66
Plant pollen	4	80.0	0.53
Cat hair	1	20.0	0.13
Mould	1	20.0	0.13
Total	52		6.91

^included foods that caused allergic reaction in <2% of subjects (n=1): pumpkin, goose, chocolate, monosodium glutamate (MSG)
#included Chinese medicine (n=2), antipsychotic (n=1) and cromoglycate eye drop (n=1)

Table 2. Prevalence of asthma in athletes

	No. of athletes (%)		
	Total (n=752)	Female (n=299)	Male (n=453)
With asthma	11 (1.46%)	4 (1.34%)	7 (1.55%)
Remission state	21 (2.79%)	6 (2.01%)	15 (3.31%)

Allergy

Food

The prevalence of food allergy in Hong Kong athletes was 3.86%. Food allergy was the most common allergy in Hong Kong athletes, which was reported by more than half of the allergic subjects (55.8%). Athletes were mainly allergic to seafood and its prevalence was 1.46%. For the athletes reported seafood allergy, at least half of them were allergic to crustacean shellfish (mostly shrimp) and 36% of them didn't mention what type of seafood they were allergic to. Beef and peanuts were also common food allergens in Hong Kong athletes, with 0.53% prevalence rate (Table 1).

Seafood, particularly crustacean shellfish, is a major cause of food allergy. Previous studies reported that seafood is the most common food allergen in Asia, especially in Taiwan, Korea, and Japan [7-9]. Seafood, including shrimp, crab and fish, were the most commonly reported food allergens in Taiwan [8]. In western countries, according to the United States Food and Drug Administration, the major food allergens were peanuts, soybean, cow's milk, egg, fish, crustacean shellfish, wheat, and tree nuts [10]. In Hong Kong, crustacean shellfish (15.8%), egg (9.1%), peanut (8.1%), beef (6.4%), cow's milk (5.7%) and nuts (5.0%) were the six leading causes of adverse food reaction in Hong Kong preschoolers [9].

Only a few athletes reported allergies in peanuts (0.53%) and tree nuts (0.4%). Several studies from Asia showed that peanuts and tree nuts were not common food allergens, compared with western countries [7,11-12]. The results of this study showed that major food allergens in Hong Kong athletes were coherent with general Hong Kong populations and other Asian populations [9,12]. Shellfish allergy is the most common while peanut and tree nut allergies are less common.

Drug

The prevalence of drug allergy was 2.93% in Hong Kong athletes, with 1.6% allergic to antibiotics, 0.53% to nonsteriodal anti-inflammatory drug (NSAID), 0.4% to analgesic drug and 0.53% to others (Table 1). A study on adult Portuguese population reported the prevalence of self-reported drug allergy was 7.8% [13]. Early studies found that female were significantly more likely to report drug allergy [13-14]. In this study, more female athletes (4.68%) claimed a drug allergy than male athletes (1.77%). Among the 22 subjects with drug allergy, penicillins (antibiotics) was the most commonly reported (31.8%), followed by paracetamol (analgesic drug) (13.6%). These findings were consistent with other studies that pencillins was the most commonly reported drug allergy [13].

Environmental

Less than 1% of participants reported allergy induced by environment. The most commonly reported allergen was plant pollen (0.53%), followed by cat hair (0.13%) and mould (0.13%). Dust mite was the most common allergen reported by secondary school students in three south-east Asian populations including Hong Kong, San Bu in China and Kota Kinabalu in Malaysia [15]. However, no athlete in this study reported dust mite as a source of allergen. Allergies induced by mould and cat hair were more frequently encountered in general population of Hong Kong, compared with the other two south-east Asian populations [15].

Asthma

A total of 32 athletes (4.3%) reported to suffer from asthma. Among those 32 athletes, 11 athletes (34.3%) reported suffering asthma during this study. Such prevalence was lower than the general population and athletic population in other countries. According to a study on the 13-14-year-old age group in 2003 [11], high asthma prevalence was found in the western developed countries such as New Zealand (26.7%), the UK (27.4%) and the USA (22.3%). In Asia, high prevalence was found in more affluent communities such as Hong Kong (8.6%), Japan (13%) and Singapore (11.4%).

The top athletes had a higher prevalence of doctors' diagnosed asthma (17%) than the general population (7%) in Germany [4]. Moreover, the German athletes performing endurance sports reported significantly more doctors' diagnosed asthma [4]. Compared with the age-matched non-athlete population (11%), higher prevalence of current asthma was found in Queensland elite athletes (14%) but no significant difference was found [6]. The study also stated that asthma tended to be more common in male athletes than in female athletes. In this study, a larger proportion of male (1.55%) than female athletes (1.34%) reported having asthma (Table 2).

Conclusion

Low prevalences of asthma and allergies were found in Hong Kong athletes. Food allergy is the most common allergy among Hong Kong athletes, followed by drug allergy. From previous study, high prevalence of asthma was found in endurance athletes such as cyclists and swimmers [4]. However, no such information was observed in this study. Athletic performance may be impaired by asthma and allergies and thus screening for asthma and allergies is important for athletes. Validated questionnaires, such as the Allergy Questionnaire for Athletes (AQUA©) [16], may be used for screening in athletes in future studies.

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