

Asia Pacific survey of physicians on asthma and allergic rhinitis (ASPAIR): data from China

David Hinds¹, Bhumika Aggarwal², Xin Du³, Aruni Mulgirigama⁴, Sumitra Shantakumar⁵

¹Real World Evidence & Epidemiology, GSK, Collegeville, PA 19426-0989, USA;

²Respiratory, Global Classic & Established Products, GSK, 139234 Singapore;

³Respiratory Therapeutic area, GSK, Shanghai 201203, China;

⁴Respiratory Franchise, GSK, Brentford, Middlesex TW8 9GS, UK;

⁵Real World Evidence and Epidemiology, GSK, 139234 Singapore.

Abstract

Background: In China, the prevalence of allergic rhinitis (AR) and asthma has increased in the past decade. As these two diseases frequently coexist, the Asia-Pacific Survey of Physicians on Asthma and Allergic Rhinitis (ASPAIR) study aimed to assess physicians' beliefs and treatment patterns of coexistent asthma-AR across six Asian countries. This analysis presents the results from China.

Methods: The 200 hospital-based general physicians and pediatricians were interviewed from five cities in China. Physicians were questioned in-person about their knowledge, beliefs and management practices for patients with coexistent asthma-AR.

Results: Approximately 70% of the physicians interviewed routinely evaluated their patients with asthma or AR for signs of coexistent disease. While the majority of physicians (>90% of physicians) recognized the increased burden of coexistent asthma-AR *vs.* one condition alone and that coexistent disease requires additional treatment, most physicians (96%) also believed that patients with coexistent asthma-AR were well managed if either condition alone improved. Similarly, although 71% of physicians selected a combination of intranasal and inhaled corticosteroids as their preferred treatment for coexistent asthma-AR, in line with treatment guidelines, two fifths of physicians indicated that treatment for coexistent disease requires too much medication and that their patients prefer oral medications and a third of physicians believed that corticosteroids should be delayed in children.

Conclusions: This survey demonstrates that physicians interviewed in China have a broad understanding of coexistent asthma-AR and its impact on patients. A holistic approach to patient management with informed decisions regarding patients' overall treatment will benefit patients who suffer from coexistent disease.

Keywords: Asthma; Allergic rhinitis; Coexistent asthma-allergic rhinitis; China; Asia-Pacific Survey of Physicians on Asthma and Allergic Rhinitis; ASPAIR

Introduction

In recent years, China has undergone rapid economic growth and industrialization, with non-communicable diseases (NCDs) now being the main health burden in China.^[1] In 2009, the four major NCDs (cancer, cerebrovascular diseases, heart disease, and respiratory diseases) accounted for approximately 80% of all deaths in urban and rural areas of China, and the prevalence of NCDs is expected to increase significantly between 2010 and 2030.^[1] Addressing the public health challenge of NCDs in China is imperative, and will likely improve outcomes for patients and result in social and economic benefits.

Previous surveys in China have shown that the prevalence of allergic rhinitis (AR) and asthma has increased in the past decade, which might be associated with China's increased urbanization and poorer air quality.^[2,3] Two large scale cross-sectional surveys conducted in all regions of mainland China found high levels of uncontrolled asthma in patients with coexistent AR and that AR was an independent risk factor for uncontrolled asthma.^[4,5] As these two conditions frequently coexist,^[6-10] accurate diagnosis and treatment of both diseases are of paramount importance, as highlighted in the Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines. ARIA stipulates that patients with one condition, AR or asthma, should routinely be evaluated for the presence of the other, and

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Correspondence to: David Hinds, Real World Evidence & Epidemiology, GSK, Collegeville, PA 19426-0989, USA
E-Mail: david.r.hinds@gsk.com

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recommends a combination of intranasal (INS) and inhaled corticosteroids (ICSs) for treating the upper and lower airways in patients with diagnosed coexistent asthma-AR.^[7] While a recent cross-sectional survey of physicians in China showed a high understanding of the burden of asthma-AR, there was evidence that ARIA treatment guidelines were not fully understood and applied in clinical practice.^[11]

The Asia-Pacific Survey of Physicians on Asthma and Allergic Rhinitis (ASPAIR) aimed to assess physicians' knowledge, beliefs, and treatment patterns of coexistent asthma-AR in six countries. This paper described the results for the physician population sampled in China.

Methods

Ethical approval

The survey protocol and consent procedure were reviewed by an Institutional Review Board of GSK and was granted an exemption as the criteria for exemption were met under 45 CFR 46.101.(b)(2) of the US Code of Federal Regulations.

Study design and participants

Details of the study design, methods, and results for the total physician sample in the ASPAIR study have been reported elsewhere,^[12] with study aspects unique to China highlighted as follows.

This was a cross-sectional survey of general physicians (ie, general practitioner/family doctor/internal medicine physicians) and pediatricians, conducted in six countries in Asia (China, India, Malaysia, the Philippines, Thailand, and Vietnam; GSK Study No. 206753). In China, the sampled general physicians and pediatricians were hospital-based physicians, as all levels of care, including primary care, are provided in hospital/clinic settings. Respiratory and non-respiratory specialists were excluded. All participating physicians were required to routinely treat at least ten asthma patients per month (adult and/or children).

A probability-based sampling methodology was used to select a representative sample of approximately 200 physicians per country. In China, a sample of hospitals was drawn from five cities (Beijing, Chengdu, Guangzhou, Shanghai, and Wuhan). The five cities fall within the ten largest metro areas of China and are representative of the largest cities in each region of China (north, south, east, west, south central). Within each city, the sampling approach was allocated by hospital tier as follows: community level: 15%; district level: 35%; and provincial or city: 50%. Tier 1 hospitals are tasked with providing preventive care, minimal health care, and rehabilitation services. Tier 2 hospitals tend to be located in a medium size city/county/district and are responsible for providing comprehensive health services, medical education as well as regional research initiatives. Tier 3 hospitals are the largest, most comprehensive hospitals, comprised of general hospitals found in large cities. A random number generator was used to select a sample of physicians (typically at a ratio of 4:1, ie, from 16 potential physicians,

four completed interviews would be obtained), with every effort made to contact selected physicians via two callback attempts and contact by letter. In addition, the number of physicians interviewed per facility was restricted to four.

All physicians were interviewed using a structured questionnaire in Mandarin or Cantonese and was administered face-to-face by an interviewer using Computer-Assisted-Personal-Interviewing tablets or laptops [Supplementary material 1 for details of full questionnaire, <http://links.lww.com/CM9/A35>].

The questionnaire covered beliefs and treatment practices in relation to the separate conditions, as well as coexistent asthma-AR, and understanding and application of the Global Initiative for Asthma report (GINA) and ARIA guidelines. In China, the mean interview length was 30 min and the response rate was 57%, similar to average results across the six participating countries.

Statistical analysis

Physician responses are summarized descriptively and presented as unadjusted means, medians, frequencies and/or proportions. Physician responses are presented as unadjusted statistics to reflect the full sampled population. Physician sample data were not weighted as standardized and reliable estimates of the key demographic parameters of physicians were not readily available for all of the countries in the survey.

Results

Physician demographics

The majority of the physicians interviewed in China were aged 35 to 54 years (78%), two thirds were female (66%), and on average physicians had been in clinical practice for 20 years [Table 1]. Compared with the total sample, fewer of the physicians interviewed in China were <35 years (11% *vs.* 27%), more were female (66% *vs.* 53%) and, on average, they had been in clinical practice for longer (median of 20 years *vs.* 14 years).^[13] Most physicians interviewed in China had received some form of additional training in the management of asthma and AR, similar to the total sample.

Burden of coexistent asthma-AR

Interviewed physicians estimated that just under half of their asthma patients also had AR (47%) and that 40% of their patients with AR also had asthma. Nearly all the physicians surveyed in China agreed that patients with coexistent asthma-AR had more burdensome symptoms than patients with one condition alone ($\geq 91\%$), leading to a greater negative impact on sleep, work, and school [Figure 1]. This was reflected in their beliefs that both conditions should be managed simultaneously (87%). More physicians agreed that patients with coexistent asthma-AR, *vs.* those with either AR or asthma alone, were more likely to require additional, unplanned healthcare visits (54% *vs.* 28% *vs.* 10%, respectively) or be hospitalized (69% *vs.* 2% *vs.* 29%,

Table 1: Profile of physicians interviewed for ASPAIR study in China (N = 200).

Items	Values
Age (years)	
Mean (SD, 95% CI)	43.8 (7.8, 42.7–4.8)
Median (range)	43 (38–49)
Age, <i>n</i> (%)	
<35 years	22 (11)
35–44 years	86 (43)
45–54 years	70 (35)
55–64 years	20 (10)
≥65 years	2 (1)
Gender, <i>n</i> (%)	
Male	68 (34)
Female	132 (66)
Type of practice, <i>n</i> (%)	
Gov't clinic or doctor's office	0
Gov't hospital/hospital-based	195 (98)
Private clinic or doctor's office	0
Private hospital/hospital-based	5 (3)
Hospital tier, <i>n</i> (%)	
Tier 3	100 (50)
Tier 2	70 (35)
Tier 1	30 (15)
Duration of clinical practice (years)	
Mean (SD, 95% CI)	19.4 (7.8, 18.3–20.5)
Median (range)	20 (14–25)
Continuing medical education, attended medical congresses, or training in the past 5 years, <i>n</i> (%)	
Asthma management & treatment	177 (89)
AR management & treatment	144 (72)
Patients seen in clinical practice	
Typical number of asthma patients per month	
Mean (SD, 95% CI)	113.0 (86.3, 100.7–124.8)
Median (range)	80 (50–150)
Age profile of asthma patients (%), mean (SD, 95% CI)*	
<12 years	41.0 (41.8, 35.3–47.0)
12–17 years	15.0 (11.1, 13.0–16.1)
18–64 years	29.0 (29.9, 25.0–33.4)
≥65 years	15.0 (17.1, 12.7–17.5)
Typical number of AR patients per month	
Mean (SD, 95% CI)	83.0 (79.6, 72.3–94.5)
Median (range)	60 (30–100)
Age profile of AR patients, mean (SD, 95% CI)*	
<12 years	40.0 (40.0, 34.3–45.4)
12–17 years	19.0 (10.2, 17.5–20.4)
18–64 years	30.0 (30.0, 25.4–33.7)
≥65 years	12.0 (14.1, 9.7–13.6)

* Some pediatricians saw patients <12 years only and some general physicians saw patients ≥18 years only, resulting in artificially large standard deviations. ASPAIR: Asia-Pacific Survey of Physicians on Asthma and Allergic Rhinitis; AR: Allergic rhinitis; CI: Confidence interval; SD: Standard deviation.

respectively). However, this also highlighted that nearly one third of physicians interviewed thought that unplanned healthcare visits and hospitalizations were more likely in patients with AR only or asthma only, respectively.

Diagnosis and assessment of asthma and coexistent asthma-AR

Approximately 70% of physicians interviewed in China reported routinely evaluating their patients with either asthma or AR for symptoms of the other condition at every

clinic visit, though external factors were also an important prompt for physicians to evaluate coexistent disease [Figures 2A and 2B]. For patients with AR, physicians were also driven by local allergen levels (44%) and local pollution levels (33%), and for patients with asthma, patients' asthma symptoms (66%) and their asthma triggers (33%) were important prompts.

All physicians used the history of asthma symptoms for diagnosing asthma in patients with AR, with a family history and exposure to common asthma triggers also

Q. The next questions ask your opinion about symptoms and behavior of patients, in general, with co-existent asthma-allergic rhinitis. Choose one of the following: Strongly Agree, Somewhat Agree, Neutral, Somewhat Disagree, or Strongly Disagree.

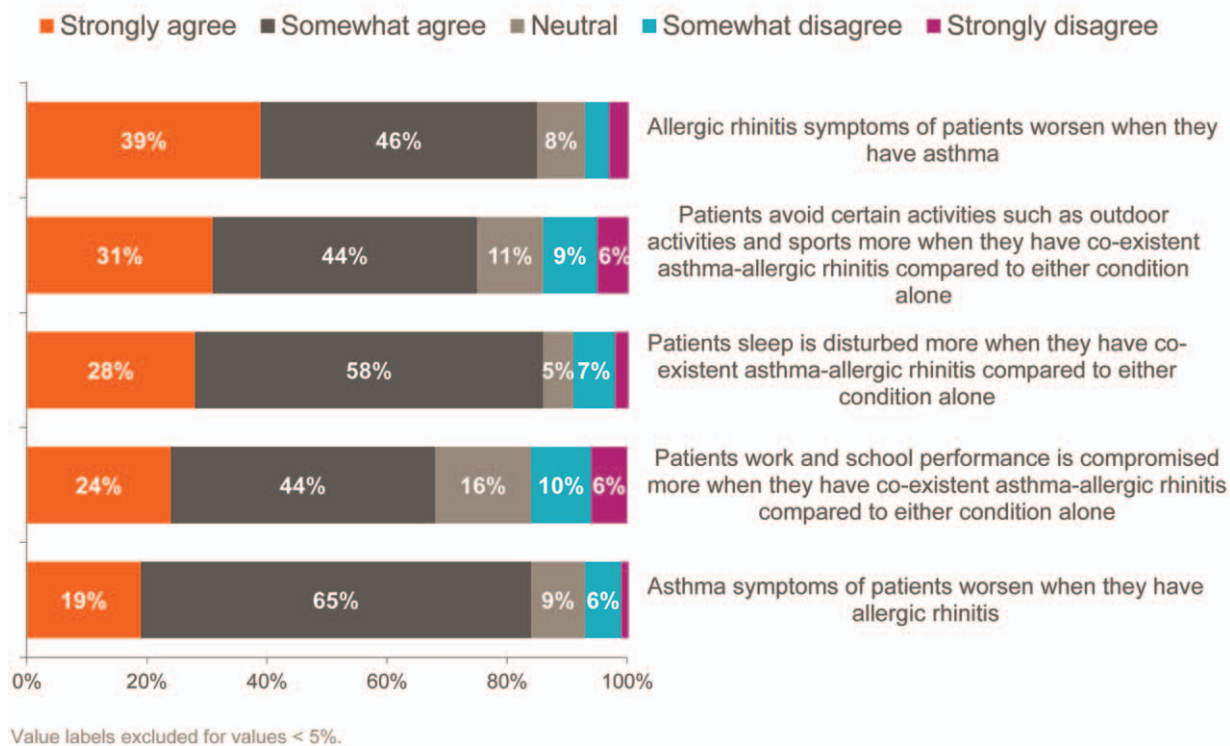


Figure 1: Physician beliefs about the impact of coexistent asthma-allergic rhinitis (N = 200).

considered important factors (79% and 74% of physicians, respectively) [Figure 3]. Similarly, a history of nasal symptoms and symptoms due to seasonal allergens were most commonly used to diagnose AR in patients with asthma [Figure 3]. The use of objective measures to diagnose either asthma or AR was not done routinely, with 57% of physicians reporting the use of spirometry for the diagnosis of asthma.

When assessing asthma control, the type and frequency of symptoms was the most commonly used criterion reported by physicians reviewing patients with asthma alone and those with coexistent asthma-AR [Figure 4]. Interestingly, the utility of night-time awakenings as an indicator of asthma control was more commonly used by physicians assessing patients with asthma alone (74%), *vs.* those with coexistent asthma-AR (55%). Differences in the way physicians assessed asthma control in patients with asthma alone *vs.* those with coexistent disease were also noted with respect to use of lung function (58% *vs.* 32%, respectively), and the assessment of exercise impairment (57% *vs.* 43%, respectively). Monitoring the frequency of short-acting β_2 -agonist (SABA) use was generally infrequent but notably lower for patients with coexistent disease (22% *vs.* 11%). On the other hand, monitoring a patient's medical history including number of clinic visits, and feedback from the patients and/or their family were given equal importance when assessing control in both groups of patients, and were used by >40% of physicians.

Management and treatment practices for patients with co-existent asthma-AR

Although all of the physicians surveyed in China agreed that treatment guidelines provide sufficient information for treating uncontrolled asthma-AR, and most (>90%) agreed that patients with coexistent disease require additional and different treatment to patients with one condition alone, nearly all physicians (96%) also believed that patients with coexistent asthma-AR were well managed if either condition alone improved. Only 50% of physicians interviewed reported using guidelines to inform their treatment choices for patients with asthma-AR, citing their own personal experience (63%) and patient affordability (55%) as more important factors [Figure 5].

When asked what controller medications they consider for treating their patients with asthma (open ended question), 90% of Chinese physicians interviewed indicated an ICS and 70% indicated an ICS/long-acting beta agonist (LABA). Other notable medications listed by physicians included oral medications ranging from leukotriene receptor antagonists (LTRAs) by 80% of physicians, theophyllines (37%), oral β_2 -agonists (24%), long-acting anticholinergics (20%), and oral corticosteroids (16%). When asked to choose their preferred treatment for coexistent asthma-AR from a given list, 71% selected a combination of ICS and INS with very few physicians choosing oral medications. This was contrary to the

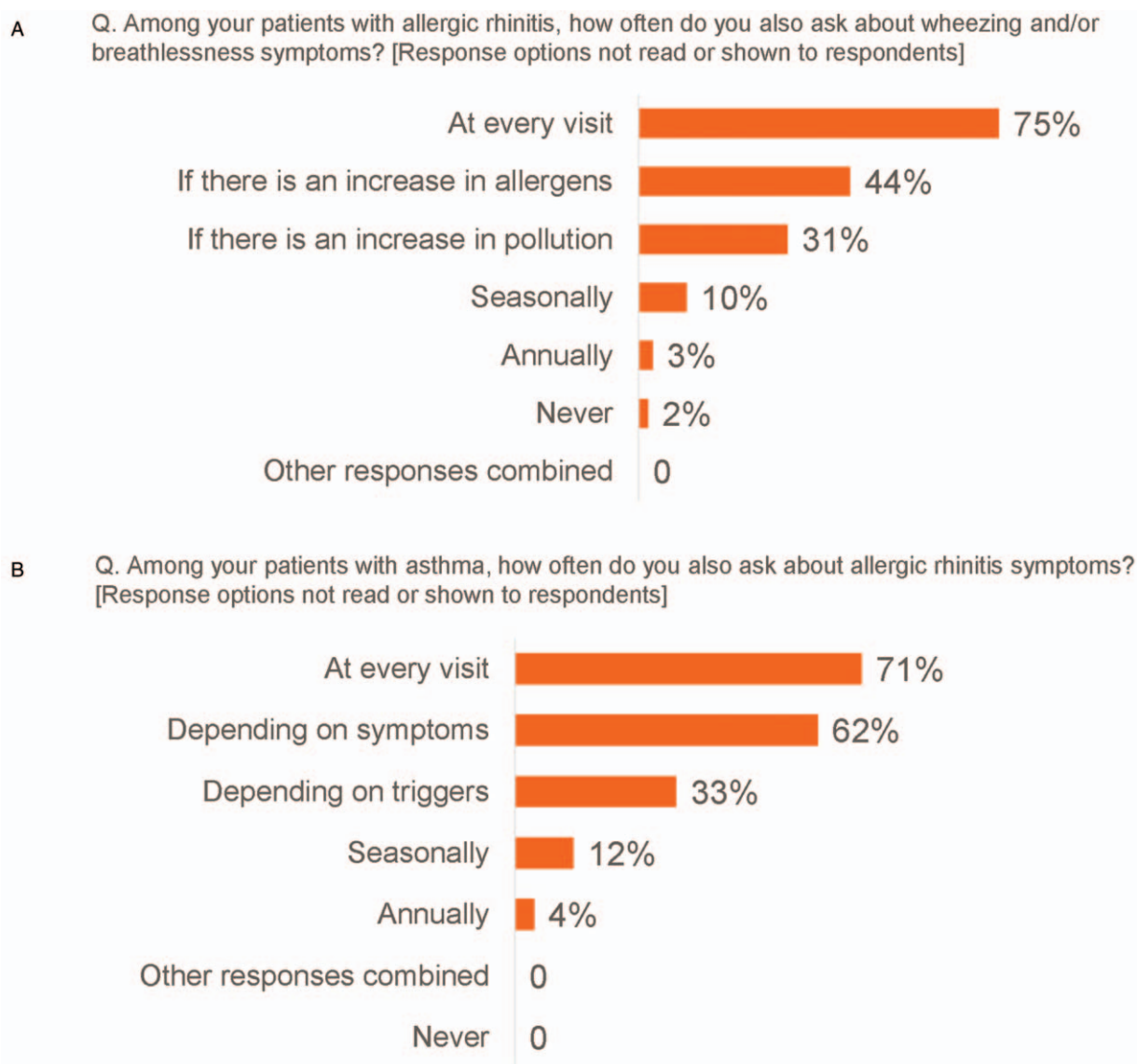


Figure 2: Frequency with which physicians in China reported routinely evaluating their patients with either allergic rhinitis (A) or asthma (B) for symptoms of the other condition (N = 200).

reported patient preference for oral medication by approximately 40% of physicians. Approximately, a third of the physicians interviewed thought that treating coexistent asthma-AR requires too much medication (32%). For the management of coexistent asthma-AR in children, the surveyed physicians in China were of the view that inhaled and intranasal corticosteroids should be delayed (34% and 30% of physicians, respectively).

Discussion

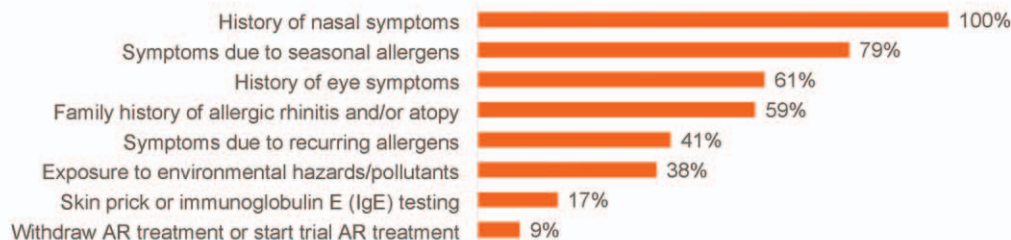
The ASPAIR survey provided insights into the knowledge, beliefs, and practices of physicians managing patients with asthma-AR in six countries in the Asia-Pacific region. The results from ASPAIR-China showed that the sampled physicians had a very high understanding of the impact of coexistent asthma-AR, recognized the significant health and social burden it imposes on patients, regularly assessing patients for the coexistence of either disease

when one is already present, in line with the ARIA and GINA guidelines.^[7,13] These results were consistent with the observation that most physicians had received additional training in the management of asthma and AR and that physicians in China reported seeing large numbers of patients with asthma and AR in their clinics each month. An interesting observation in China was that the frequency of assessing coexistent disease in patients with one condition was also driven by external factors such as allergen and pollution levels. This might be expected in view of China’s recent and rapid development and urbanization, and highlights physicians’ awareness of the potential impact of these external triggers on both diseases.

Although all physicians sampled in China acknowledged and accepted the international guidelines for managing asthma (GINA) and coexistent asthma-AR (ARIA), there were some areas where their beliefs and clinical practices

Criteria to Assess AR Symptoms among Asthma Patients

Q. What criteria do you utilize to assess allergic rhinitis symptoms among asthma patients? [Response options not read or shown to respondents]



Criteria to Diagnose Asthma Symptoms in AR Patients

Q. What criteria do you utilize to diagnose asthma symptoms among allergic rhinitis patients? [Response options not read or shown to respondents]

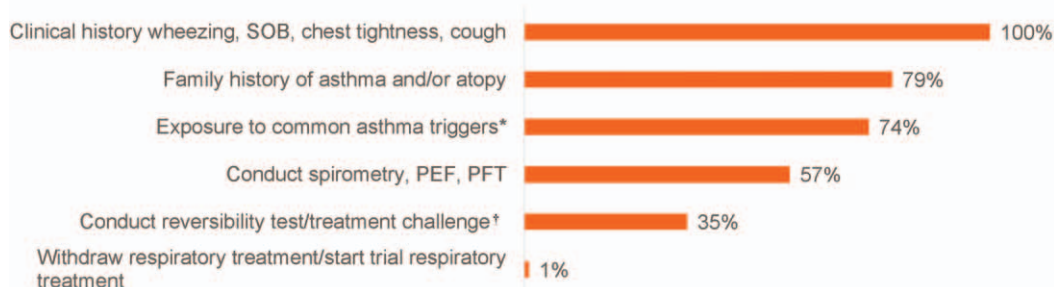


Figure 3: Criteria physicians in China use to diagnose coexistent asthma and allergic rhinitis (N = 200). *Triggers including animal dander, exhaust fumes, exercise. †Treatment challenge with bronchodilator or methacholine. PEF: Peak expiratory flow; PFT: Pulmonary function test; SOB: Shortness of breath.

Q. How do you assess asthma control in asthma patients? Q. How do you assess asthma control in patients who also have allergic rhinitis? [Response options not read or shown to respondents]

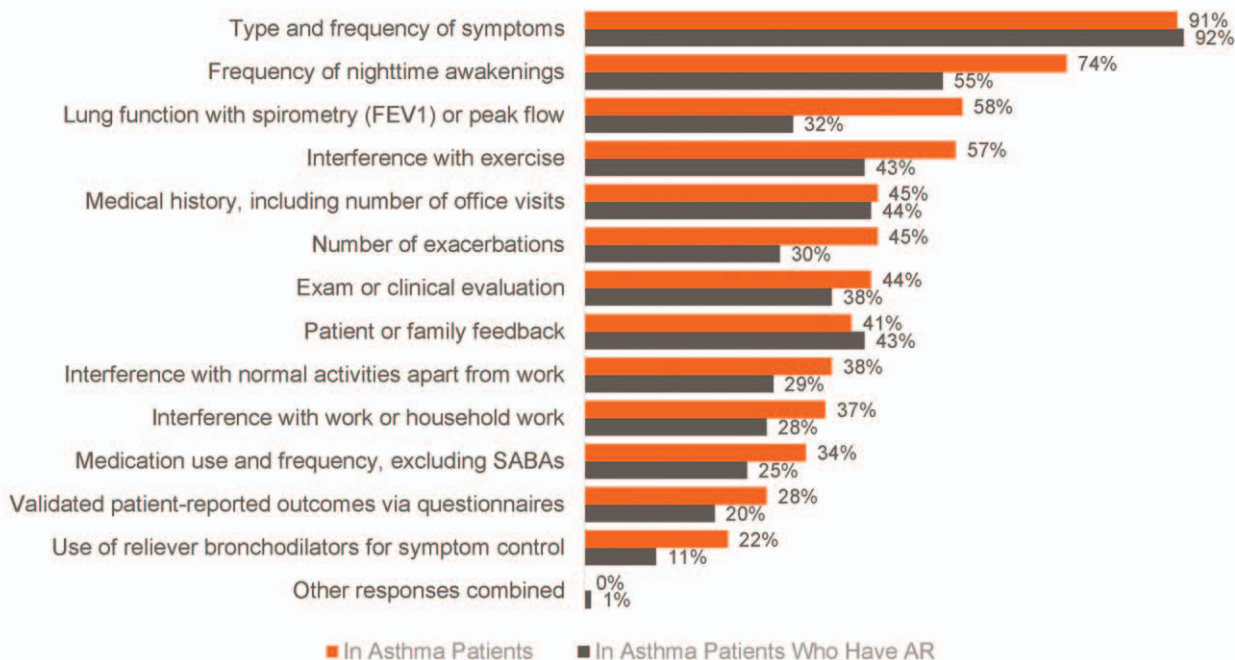


Figure 4: Criteria used to assess asthma control by physicians in China (N = 200). AR: Allergic rhinitis; FEV1: Forced expiratory volume in 1 s; SABA: Short-acting beta-agonist.

were not completely consistent with guideline recommendations. This was particularly true regarding treatment choices, where personal experience was the most common driver of treatment decisions. The surveyed population

may have influenced this observation, as the sampled physicians in China tended to be older and have spent significant time in clinical practice. The fact that physicians in China saw large volumes of patients, possibly indicating

Q. What factors, excluding individual patient characteristics, influence your choice of treatment? [Response options not read or shown to respondents]

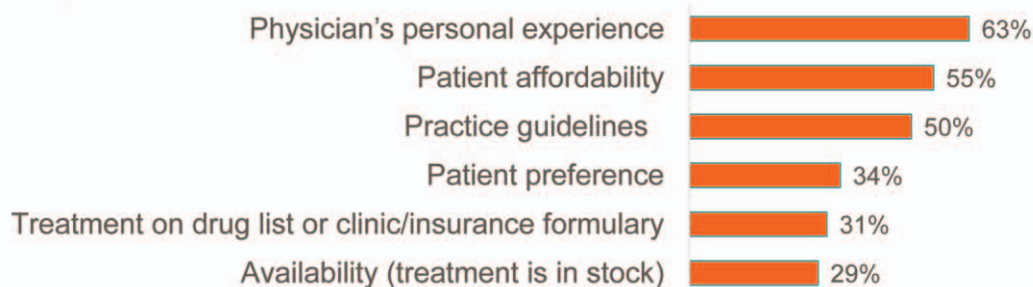


Figure 5: Factors influencing treatment choice for asthma-allergic rhinitis of physicians in China (N = 200).

less available time spent per individual patient, may also be a factor in physicians relying on their personal experience for treating patients rather than full implementation of the guidelines. A lack of time has been highlighted previously as a barrier to implementing practice guidelines.^[14]

The healthcare system in China may have also influenced observations regarding physicians' beliefs. The use of spirometry to diagnose asthma was used by approximately 50% of physicians interviewed, and this relatively low use could be due to more symptomatic or severe patients being referred to specialists, which may be driven by patients who tend to believe that the quality of care provided by specialists is superior to general practitioners.^[15] The frequent evaluation of patients with either asthma or AR for symptoms of the other condition by >70% of physicians interviewed in China may, paradoxically, be related to the hospital/clinic based nature of healthcare delivery in China, that is, if different physicians are evaluating a patient at their clinic reviews each time, then they may be more inclined to check for other symptoms.

Another interesting observation in this data set was in the criteria physicians used to assess asthma control in patients with asthma alone compared with patients with coexistent asthma-AR. Global and local guidelines in China recommend assessing asthma control based on frequency of daytime symptoms, night-time awakenings, reliever medication use, and activity limitation.^[13,16] While most physicians monitored the frequency of symptoms for assessing control in both patient types, the other criteria were used less commonly, and noticeably less frequently in patients with coexistent asthma-AR *vs.* asthma alone. This highlights the need for diligent assessment of asthma control in patients with coexistent disease.

Finally, although most physicians interviewed in China believed that patients with asthma-AR required additional and different treatments to those with one condition only, these views were not supported by their responses to other questions about treatment. Among the surveyed physicians, two in five reported that their patients preferred to take oral medications rather than nasal sprays and inhalers, and the majority of physicians utilized LTRAs in addition to SABA for treating asthma. Very few

physicians chose oral LTRA as a preferred treatment for asthma-AR when the physicians were given a specific list of medications to choose from. However, this survey revealed physician concerns over both too much medication and the overall steroid burden of treating patients with both conditions. For patients with coexistent asthma-AR, undertreatment with the appropriate medications was not only seen in China but was also reported by physicians in other countries.^[12] Physicians appear to be aware of the guideline-recommended treatments for asthma-AR but may not routinely incorporate the recommendations into their clinical practice.

A limitation of the ASPAIR China survey is that, due to the size of this country, the sampling of five big cities within large metro areas of China, covering each region of China, may not be truly representative of physician views across China, particularly with respect to rural areas. However, within these constraints, a systematic sampling plan was implemented to obtain a representative sample of physicians within tiers and facilities and, reassuringly, demographic characteristics of general physicians in our survey were consistent with those reported in the Global Asthma Physician Survey (conducted in 2015 in Australia, Canada, China, France, Germany, and Japan).^[17] Further study of potential differences in physician views on asthma and AR utilizing methods optimal to understand rural *vs.* urban differences is warranted, as differences have previously been noted in the management of childhood asthma.^[18]

In conclusion, ASPAIR study in China demonstrates that surveyed physicians had a broad understanding of coexistent asthma-AR, its impacts on patients and healthcare resource use, and the required treatments. ASPAIR study in China brings forth a need for improved education about coexistent asthma-AR management in real-life clinical practice. Additionally, it conveys the need to establish parameters of achievable control of coexistent asthma-AR with appropriate medications. The discrepancy between the physician knowledge and patient management of coexistent asthma-AR in clinical practice suggested that a holistic approach to patient management with informed decisions regarding patients' overall treatment would benefit patients who suffer from coexistent disease.

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Conflicts of interest

All authors are GSK employees and all hold GSK shares.

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