

ORIGINAL ARTICLE

Iran J Allergy Asthma Immunol

March 2007; 6(1): 21-25

Agreement between Written and Video Asthma Symptoms Questionnaires in School Children in Urmia, Iran

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Received: 14 August 2006; Received in revised form: 30 September 2006; Accepted: 17 October 2006

ABSTRACT

The prevalence of asthma remains difficult to determine with precision with no absolute or gold standard for diagnosis. International Study of Asthma and Allergies in Childhood (ISAAC) developed video questionnaire for epidemiological studies with less reliance on understanding written asthma questionnaire. The aim of this research was to determine the agreement between the ISAAC written and video questionnaires (AVQ3.0) on respiratory symptoms and reported asthma.

We studied 3000 children aged 13-14 years in Urmia, Iran who completed sequentially the ISAAC written and video questionnaires (AVQ3.0) at school. The agreement between responses to the two questionnaires for reported wheeze ever, current wheeze, wheeze on exercise, and nocturnal wheeze (the latter three questions relating to symptoms in the previous 12 months), and to any combination of the latter three questions was examined by using concordance and kappa coefficients as measures of agreement.

The prevalence of wheeze ever, current wheeze, wheeze on exercise, and nocturnal wheeze were significantly lower based on responses to the video questionnaire compared to the written questionnaire. Although concordance between video and written questionnaires was high (75% to 93%) for related questions, agreement measured by the kappa statistic for each question was only poor i.e. 0.22, 0.21, 0.13 for resting wheeze, exercise induced wheeze, and nocturnal wheeze respectively.

We conclude that the video questionnaire yields lower reported prevalence rates for asthma symptoms, and that there is poor agreement between responses to the two questionnaires in Iranian children.

Key words: Asthma; ISAAC; Iran; Prevalence; Video questionnaire

INTRODUCTION

Comparing the prevalence of asthma in different

populations has been difficult because of the lack of a precise definition, differences in diagnostic habits, and dissimilarities in survey methods. Epidemiological studies rely largely on reported symptoms such as dyspnea, wheezing, chest tightness, and cough. Diagnosis of asthma or drug treatment sometimes is accompanied by one or more physiological measurements. Although symptoms are sensitive for

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the presence of asthma, they are relatively nonspecific. Furthermore, they may be influenced by perception, recollection, culture, and the interviewer. Even more the diagnosis of asthma may be biased by availability of healthcare services and perception of physician.¹

To counter the problem, the International Study of Asthma and Allergies in Childhood (ISAAC) used both written (WQ) and video questionnaires (AVQ2.0 & AVQ3.0) to determine the prevalence and severity of asthma symptoms in 13 to 14 year old school children.²⁻⁴ Showing, rather than describing, symptoms and signs of asthma may provide more accurate recognition of asthma without the potential biases of written questionnaires. The written questionnaire sought information on the presence, frequency, and severity of wheeze, wheeze on exercise, and nocturnal wheeze. The ISAAC video questionnaire (AVQ3.0) comprises five scenes of young people from different ethnic origins manifesting these features of asthma, followed by questions on a paper asking the viewer whether they had similar episodes.

We performed ISAAC phase one in 13 to 14 years old students in Urmia the capital of west Azerbaijan province, Iran. The study showed differences between written and video questionnaire for prevalence of asthma. Are these differences by chance or related to method, translation or difference in severity. In this study we determine agreement between ISAAC asthma WQ and AVQ3.0 in Iranian schoolchildren.

PATIENTS AND METHODS

Participants

According to ISAAC committee recommendation we decided on a sample size of 3000 schoolchildren.⁴ In Iranian educational year 2001-2002, three thousand-fifty-three students aged 13-14 years completed Persian translated ISAAC written asthma questionnaire first followed by video asthma questionnaire (AVQ3.0) at schools.

ISAAC International Video Questionnaire (AVQ 3.0)

The video questionnaire comprised five video sequences of young people with various asthmatic symptoms. The first three sequences showed various scenes of wheezing, and the final two displayed other asthmatic symptoms, such as moderate wheezing at rest

(a Caucasian girl), wheezing after exercise (an African black boy), waking at night with wheezing (a Caucasian girl), waking at night with coughing (a Maori boy), and a severe attack of asthma with wheezing and breathlessness at rest (an Indian girl). After each sequence, the students were asked if they have had the same experience shown in the video and, if "Yes", "in the last 12 months?" and if "Yes" again "in the last month?"

Each question corresponding to a scene was printed on a one-page answer sheet which was completed during the viewing of the video film. The whole video took about seven minutes to run. The term 'asthma' was not mentioned during the presentation. The ISAAC AVQ2.0 is used in Europe.

ISAAC Written Questionnaire (WQ)

The ISAAC WQ on asthma included five questions which correspond to the five sequences depicted in the video questionnaire. They were as follows:

1. Have you had wheezing or whistling in the chest in the last 12 months?
2. In the last 12 months, has your chest sounded wheezy during or after exercise?
3. In the last 12 months, how often, on average, has your sleep been disturbed due to wheezing?
4. In the last 12 months, have you had a dry cough at night, apart from a cough associated with a cold or chest infection?
5. In the last 12 months, has wheezing ever been severe enough to limit your speech to only one or two words at a time between breaths?

We used Persian translated version of ISAAC questionnaires. They had already been used in Iranian part of ISAAC study in Tehran and Rasht.^{2,3}

Statistical Analysis

We used SPSS for windows (version 11) statistical package (SPSS, Chicago, IL, USA) for analysis. The agreement between video and written questionnaires was examined for each of five sequences by calculating Cohen's kappa, concordance and the proportion of positive and negative agreements (P pos; P neg). The responses considered were *YES* and *NO*: any other response was collapsed with *NO*.

The strength of agreement by Cohen's kappa coefficient was appraised as excellent if Kappa was ≥ 0.75 , good agreement for $0.4 < \text{kappa} < 0.75$ and poor agreement if kappa was ≤ 0.4 .⁵

Written and Video Asthma Symptom Questionnaires

RESULTS

Three thousand fifty-three students aged 13-14 years-old filled out asthma written and video questionnaires, of those 53 were incomplete so results of 3000 questionnaires were analyzed for agreement of video and written questionnaires. Proportion of positive responses to written, video and both questionnaires are shown in (Figure 1). More children changed answers from a previous YES in the written questionnaire to NO, than changing a previous NO to a YES response after watching the corresponding scene in the video questionnaire. The four measurements of agreement (Kappa, Concordance, P neg, P pos) for five sequences of video questionnaire and written counterpart are shown in (Table 1). Although concordances were high (78% to 93%), kappa index varied between 0.13 to 0.25 indicating poor agreement. The proportion of negative agreement was high ranging 75% to 93%, however proportion of positive agreement was much lower only 0.06%-0.67%.

DISCUSSION

The ISAAC video questionnaires is a validated instrument developed for use in international epidemiological studies to facilitate comparisons between countries involving different languages and cultural groups, aiming to elicit responses regarding wheezing and asthma without using language-dependent instruments.⁴

The two questionnaires have a reasonable and comparable sensitivity and specificity for airway hyperresponsiveness to methacholine in as evaluated

English-speaking and Chinese-speaking children.⁶ There was no consistency of priority between the two questionnaires in predicting bronchial hyper-reactivity in a group of Korean school children.⁷

In this study, the degree of agreement between the ISAAC written and video (AVQ3.0) questionnaires in Iranian children, as measured by the kappa coefficient was poor for all the questions.

There are several reported comparisons of these questionnaires applied to children with different languages or cultural groups. Inconsistencies between the written and video questionnaires have been assumed to be due to the video questionnaire being less influenced by cultural differences than the written questionnaire. Crane et al⁸ studied agreement between two ISAAC questionnaires in 99 centers in 38 countries and reported kappa variation from 0.05 in Tirana, Albania, to 0.66 in Chandigarh in India. In their report in 79 of 99 centers kappa <0.4 indicated poor agreement and in 20 centers 0.44 to 0.66, showed moderate agreement.

In our study the proportion of negative agreement was high ranging 0.85-0.99 but that of positive agreement was much lower ranged 0.06-0.67. The degree of concordance between written and video questionnaire in our study was high similarly to most previously reported studies. Pekkanen et al.⁹ showed good negative agreement but poor positive agreement between both questionnaires for wheezing questions in Finland. Although straightforward, the simple calculation of concordances has two weaknesses. First, concordance does not take into account that this measure is strongly dependent on the distribution of positive and negative responses.

Table 1. Responses of the whole sample in percentage (of 3000 school children) to written and video questionnaires for wheeze ever, current wheeze, wheeze on exercise, and nocturnal wheeze, and a positive response to any of the three video sequences of wheezing and measurement of agreement.

Question	Questionnaires answer in %				Measurement of agreement			
	Both YES	Written only YES	Video only YES	Both NO	Con* in %	Ppos†	Pneg‡	Kappa index
Resting wheeze	2.6	11.8	2.0	83.6	86	0.16	0.858	0.22
Exercise induced wheeze	4.1	19.1	4.1	71.4	75	0.15	0.75	0.21
Nocturnal wheeze	0.6	6.9	0.6	91.9	92	0.07	0.92	0.13
Nocturnal cough	4.5	16.9	9.31	75.6	80	0.18	0.78	0.23
Severe asthma attack	0.9	3.9	2.3	92.9	93	0.64	0.93	0.200
Any wheeze §	6.7	17	5.8	70.5	82	0.20	0.81	0.25

Con*: Concordance; Ppos†: Proportion positive agreement; Pneg‡: Proportion negative agreement

§: A positive response to any of wheezing sequences in video questions versus wheeze ever in WQ

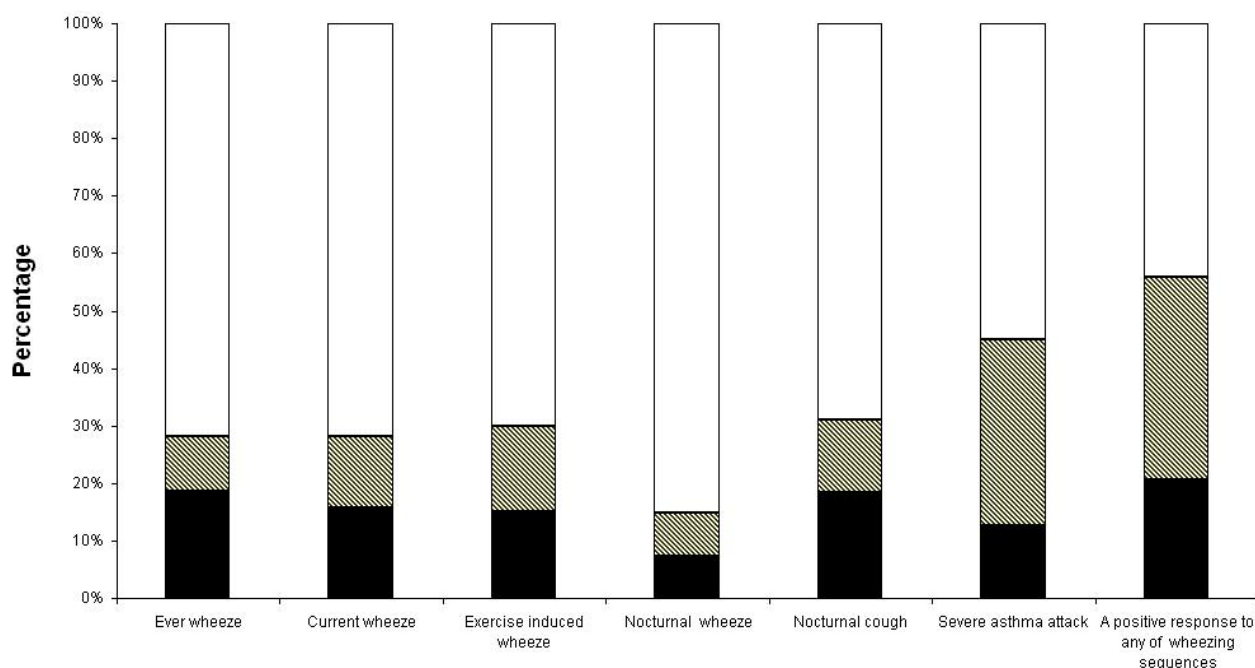


Figure 1. Positive response to each question in each questionnaire (□: written; ▨: video) and both questionnaires combined (■) as percentage of all positive responses.

A striking example of this is seen in (Table 1) while concordance for severe asthma attacks was 93% heavily influenced by the fact that 92.9% responses were negative only 0.9% was positive for both questionnaires. Second, concordance does not consider that some of the agreements occur just by chance. In contrast, the kappa coefficient examines the proportion of responses that would be expected by chance given the marginal distributions. Our results confirm and extend the observations of Lai et al.⁶ in 189 Chinese children in whom the agreement between written and video questionnaire, as measured by the kappa coefficient, was low for wheeze ever, wheeze on exercise, and nocturnal wheeze.

Pizzichini et al.¹⁰ showed low kappa value ($k = 0.22-0.51$) in Canadian study and calculated low kappa values for agreement from published studies [France (all kappa < 0.35), Australia (all < 0.6), with a broader range in Italy (0.37–0.77)].

In our study many more children changed answers from a previous YES in the written questionnaire to NO, than changing a previous NO to a YES response after watching the corresponding scene in the video questionnaire. This finding suggests that all discrepancies between video and written questionnaire

cannot be simply attributed to difficulties in translation of the questionnaires or understanding questions. Part of these discrepancies may be due to those scenes displayed on the video reflect more severe wheeze, and hence the video questionnaire probably underestimates the prevalence of milder asthma. This possibility is supported by previous studies reporting that the proportion of positive answers to the written questionnaire, either in children of the same language or in children of different countries, was higher than obtained with the video questionnaire. In Crane et al.⁸ study, among 90 out of 99 centers the frequency of positive responses to written question on wheezing in the last 12 months were greater than for the video question.

In conclusion, we have shown that the agreement between the ISAAC written and video questionnaire in Iranian schoolchildren is poor. The limited agreement between the two instruments is not simply related to cultural, language, literacy, or interviewer bias associated with written questionnaires. These may be due to that scenes displayed on the video which reflects more severe wheeze, and hence the video questionnaire probably underestimates the prevalence of milder asthma.

Written and Video Asthma Symptom Questionnaires

ACKNOWLEDGMENT

The authors would like to thank schoolchildren, teachers and other staff who participated in the survey. We also thank Mr. Khalkhali for help in statistical analysis. This study was impossible without help of Dr Ali Hamzezadeh and other members of Urmia University of medical sciences and students' research committee which authors are indebted to them. This study was approved by Urmia University of medical science and performed by its financial support.

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