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The Prevalence of Self-reported Respiratory Symptoms, Asthma and use of Asthma Medication Among Young Adolescents from Southeast Kosovo

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ABSTRACT

Introduction: Asthma is a chronic inflammatory airway disease characterized by episodes of airway narrowing leading to manifestations of symptoms such as wheeze, shortness of breath, chest tightness and cough, that may resolve spontaneously or following treatment. **Aim:** The aim of this paper was to present the collected data related to the prevalence of self-reported respiratory symptoms, asthma, and use of asthma medication among school children aged 13-14 years from the city of Gjilan, a municipality located in southeast Kosovo. **Methods:** This was a cross-sectional study realized during the year 2018 as a part of the Project of Global Asthma Network (GAN) Phase I. The study elaborated randomly selected sample of 1200 school children from the city of Gjilan, in the southeast of Kosovo. The mean age was 13.4±0.51 with median IQR=13 (13-14). About 618 (51.5%) were male and 582 (48.5%) were female with the relation between the genders of 1:1.1. The percentage difference between the genders was not statistically significant (Difference test: Difference 3% [(-0.99-6.99) CI 95%]; Chi-square=2.159; df=1 p=0.1417). The prevalence of wheezing/whistling in the chest EVER and the last 12 months was 12.7% vs. 6.4% respectively with no significant association between gender and symptoms (p>0.05) (Table 1). About 1132 (94.3%) had no attacks of wheezing in the last 12 MONTHS, 59 (4.9%) had 1-3 attacks, 7 (0.6%) had 4-12 attacks and 2 (0.2%) had >12 attacks. The analysis did not indicate a significant association between gender and the frequency of wheezing attacks (none / 1-3 / ≥ 4) for Pearson Chi-square: 2.5501; df=2; p=0.2801. **Conclusion:** This study has found moderately low asthma prevalence among adolescents in the southeast region of Kosovo, with no significant association between genders. Although, should be considered as an urgent need the proper examination, because asthma seems to be under-diagnosed and also untreated. It's possible that doctors in our country hesitate to diagnose asthma or the parents themselves and the children deny it. **Keywords:** Asthma, Respiratory symptoms, Kosovo.

1. INTRODUCTION

Asthma is a chronic inflammatory airway disease characterized by episodes of airway narrowing leading to manifestations of symptoms such as wheeze, shortness of breath, chest tightness and cough, that may resolve spontaneously or following treatment (1, 2).

Asthma is a serious health problem that affects about 339 million people worldwide, with an increasing prevalence especially among children (2, 3). Of serious concerns are deaths due to asthma, with around 1000 deaths each day, as many of them may be preventable (3). Asthma in children often goes under-diagnosed and consequently untreated or delayed treated with inadequate dis-

ease control and higher treatment cost (4, 5).

Measured by disability-adjusted life years (DALYs), globally, asthma is ranked 16th among the leading causes of years lived with disability since uncontrolled asthma interferes with daily activities that can greatly reduce a person's quality of life, and 28th among the leading causes of burden of disease, including the direct costs of treatment and the indirect costs (absenteeism and decreased productivity at work and school) (3, 6).

To determine the prevalence of asthma throughout the world, epidemiological studies have been focused on self-report asthma symptoms using standardized questionnaires. The most comprehensive information re-

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lated to the prevalence and impact of various factors on asthma and their comparison between different countries is obtained from the International Study of Asthma and Allergies in Childhood (ISAAC) that was realized in three phases, during the period 1991-2004 (6, 7). Large variations in both prevalence and severity of asthma among different regions and countries have been reported since the first global reporting by ISAAC (6-8).

To continue monitoring asthma and also to extend asthma strategies, with the aim of decreasing severity and improving symptoms control, and on the other hand considering that nearly half of the world's countries have never studied the prevalence of asthma, in 2012 was established the Global Asthma Network (GAN) by a scientist from ISAAC and the International Union Against Tuberculosis and Lung Disease (The Union) (3, 9, 10).

For Kosovo this was the first time until now, as a part of the GAN study, the asthma problem among adolescents to be analyzed.

2. AIM

The aim of this paper was to present the collected data related to the prevalence of self-reported respiratory symptoms, asthma, and use of asthma medication among school children aged 13-14 years from the city of Gjilan, a municipality located in southeast Kosovo.

3. MATERIAL AND METHODS

Study design

This was a cross-sectional study realized during the year 2017 as a part of the Project of Global Asthma Network (GAN) Phase I.

Sample of the study

The study includes 1200 schoolchildren from randomly selected schools in the city of Gjilan, a municipality located in the southeast of Kosovo, from both genders, aged 13-14 years, after was received the passive consent of their parents/guardians.

Study instrument

The standardized written questionnaires of GAN developed from ISSAC questionnaires used in Phases I and III, were used in the study, after being translated into the Albanian language and validated, with no additional questions added. For the evaluation of the translated questionnaires, a pilot study was applied to 50 randomly selected children and remarks were included in the final version of the questionnaires. In this study, we estimated the prevalence of asthma symptoms based on the responses related to: wheeze ever, wheeze in the past 12 months, frequency of severe episodes of wheeze in the past 12 months (symptoms of severe asthma). Symptoms of severe asthma are defined as those with current wheeze who, in the past 12 months, have had ≥ 4 attacks of wheeze, or ≥ 1 night/week sleep disturbance from wheeze, or wheeze affecting speech. Assessment of the prevalence of asthma is based on self-reported asthma (asthma ever and physician-diagnosed asthma). We have also analyzed the use of asthma action plan and also the use of asthma medication in the past 12 months

(short-acting β -agonist (SABA), long-acting β -agonist (LABA), inhaled corticosteroids (ICS), ICS+LABA.

Implementation of the study

First, we measured the weight and height of the children, whereas they were wearing light clothing and were barefooted. After that, the questionnaires were given to the children to be filled out, for 60-90 minutes. The whole process has been observed by the trained representatives from the project time and children were told to be free to ask questions about possible dilemmas.

Ethical approval

The implementation of GAN Phase I in Kosovo was approved by the Ethics Committee of The Ministry of Health and The Ministry of Education and Science, Kosovo.

Statistical analyses

The data were statistically analyzed in SPSS software package, version 22.0 for Windows (SPSS, Chicago, IL, USA). According to ISAAC recommendation, missing or "any other" responses were part of the denominator for the calculation of allergic rhinitis and eczema prevalence figures (ISAAC Phase III Newsletter. Auckland, New Zealand, December 2001). Quantitative series were present as mean, median and standard deviation. To determine the association between qualitative variables Pearson Chi-square test was used. A two-sided analysis with a significance level of $p < 0,05$ was used to determine the statistical significance.

4. RESULTS

The study elaborated on a randomly selected sample of 1200 school children from the city of Gjilan, in the southeast of Kosovo. The mean age was 13.4 ± 0.51 with median IQR=13 (13-14). About 618 (51.5%) were male and 582 (48.5%) were female with the relation between the genders of 1:1.1. The percentage difference between the genders was not statistically significant (Difference test: Difference 3% [(-0.99-6.99) CI 95%]; Chi-square=2.159; df=1 $p=0.1417$).

The prevalence of wheezing/ whistling in the chest ever and in the last 12 months was 12.7% vs. 6.4% respectively with no significant association between gender and symptoms ($p > 0.05$) (Table 1). About 1132 (94.3%) had no attacks of wheezing in the last 12 months, 59 (4.9%) had 1-3 attacks, 7 (0.6%) had 4-12 attacks and 2 (0.2%) had > 12 attacks. The analysis did not indicate a significant association between gender and the frequency of wheezing attacks (none / 1-3 / ≥ 4) for Pearson Chi-square: 2.5501; df=2; $p=0.2801$.

Disturbed sleep due to wheezing in the last 12 months had 34 (2.8%) of adolescents. Less than 1 night per week with disturbed sleep reported 23 (1.9%) of adolescents, 7 (1.1%) of males and 16 (2.7%) of females. With disturbed sleep, ≥ 1 night per week were 11 (0.9%) adolescent out of which 7 (1.1%) males and 4 (0.7%) females. No significant association was found between gender and frequency of disturbed sleep due to wheezing in the last 12 months Pearson Chi-square: 4.7771; df=2; $p=0.0918$). About 2% of adolescents declare wheezing severe enough to limit their speech in the last 12 months (Table 1).

The prevalence of self-reported asthma ever was 45 (3.7%), with 25 (2.1%) who had asthma diagnosed by a doctor (Table 2). Additionally, we analyzed the presents of the three symptoms (more than 4 attacks of wheezing in the past 12 months or 1-2 nights/week sleep disturbance due to wheezing in the past 12 months or wheeze affecting speech in the last 12 months) among the children in the sample. One of the three symptoms was present in 22 (1.8%) of adolescents, 12 (1.9%) male and 10 (1.7%) female. Two of the symptoms were present in 8 (0.7%) adolescents, 4 (0.6%) male and 4 (0.7%) female. All three symptoms were present in 2 (0.2%) of the adolescents, and all of them among male 3 (0.3%). Minimum one of the three symptoms was present in 30 (2.7%) of adolescents.

The asthma action plan was used by 7 (0.6%) of adolescents, 3 (0.5%) of males and 4 (0.7%) of females.

Due to breathing problems in the last 12 months, 100 (8.3%) of adolescents inhaled medication.

Only when needed use of short-acting β -agonists (SABAs) declared 44 (3.7%), of long acting β -agonists (LABAs), declared 22 (1.8%), of inhaled corticosteroids (ICS), declared 22 (1.8%), of combination ICS and LABA declared 20 (1.7%). Every day use of short-acting β -agonists (SABAs) declared 6 (0.5%) and of inhaled corticosteroids (ICS) declared 2 (0.2%). None of the adolescents stated everyday use of inhaled long-acting β -agonists (LABAs) or Combination ICS and LABA daily (Table 3).

5. DISCUSSION

This study is the first in Kosovo related to asthma and therefore the obtained data can be used as a baseline for further epidemiological research of asthma. Concerning asthma symptoms, the prevalence of wheeze ever was 12,7% whereas the prevalence of wheeze in the last 12 months was 6,4%, which were much higher than the prevalence of established doctor-diagnosed asthma and self-reported asthma-ever that were 2,11% respectively 3,7% suggests under-diagnosis of asthma in this region. Under-diagnosed asthma consequently does not have adequate care and may go into a vicious circle of asthma control, which is notable in lower-income countries (11, 12). Although, suboptimal asthma management was a global phenomenon reported by recent epidemiological surveys and as recommended by guidelines, is satisfactory in less than 30% of children (5, 12, 13).

The global prevalence of wheeze in the past 12 months registered during ISAAC Phase III was 13.7% (14), indicates for moderately low asthma prevalence among our adolescents. Large variations in the global prevalence of asthma among adolescents have been recorded by ISAAC phase III, with a prevalence of wheeze in the past 12 months varied from 32.6% in New-Zealand to 0.8% in China, that was higher in more affluent countries,

Questions	Gender (N=1200)			p	
	Male	Female	Total		
Have you ever had wheezing or whistling in the chest at any time in the past?					
Yes	N	80	73	153	Pearson Chi-square: 0.0435; df=1; p=0.8347
	%	12.94%	12.54%	12.75%	
No	N	538	509	1047	
	%	87.06%	87.46%	87.25%	
Have you had wheezing or whistling in the chest in the past 12 months?					
Yes	N	44	33	77	Pearson Chi-square: 1.0489; df=1; p=0.3058
	%	7.12%	5.67%	6.42%	
No	N	574	549	1123	
	%	92.88%	94.33%	93.58%	
Has your sleep been disturbed due to wheezing in the past 12 months?					
Yes	N	14	20	34	Pearson Chi-square: 1.4930; df=1; p=0.2217
	%	2.27%	3.44%	2.83%	
No	N	604	562	1166	
	%	97.73%	96.56%	97.17%	
In the past 12 months, has wheezing ever been severe enough to limit your speech to only one or two words at a time between breaths?					
Yes	N	12	12	24	Pearson Chi-square: 0.0221; df=1; p=0.8819
	%	1.94%	2.06%	2%	
No	N	606	570	1176	
	%	98.06%	97.94%	98%	

Table 1. Analysis of adolescents related to problems with wheezing/whistling in the chest by gender. *significant for p<0.05

Questions	Gender (N=1200)			p	
	Male	Female	Total		
Have you ever had asthma?					
Yes	N	25	20	45	Pearson Chi-square: 0.3079; df=1; p=0.5789
	%	4.05%	3.44%	3.75%	
No	N	593	562	1155	
	%	95.95%	96.56%	96.25%	
Was asthma confirmed by a doctor?					
Yes	N	16	9	25	Pearson Chi-square: 1.5971; df=1; p=0.2063
	%	2.59%	1.55%	2.08%	
No	N	602	573	1175	
	%	97.41%	98.45%	97.92%	
Do you have a written plan which tells you how to look after your asthma?					
Yes	N	3	4	7	Pearson Chi-square: 0.2106; df=1; p=0.6463
	%	0.49%	0.69%	0.58%	
No	N	615	578	1193	
	%	99.51%	99.31%	99.42%	

Table 2. Distribution of asthma by gender. *significant for p<0,05

whereas more severe in less affluent countries (6-8, 15). Several reasons have been given to explain this observation such as the low socioeconomic status limits access to the healthcare system, lack of awareness that the wheezing can be asthma and the differences in environmental exposure, including air pollution and infectious agents (11, 12, 16, 17).

Cocerning severity of asthma in our study (≥ 4 attacks of wheeze, or ≥ 1 night/week sleep disturbance from wheeze, or wheeze affecting speech) the prevalence was 1,83% with one of the symptoms present, 0,67% with two

of the symptoms present and 0.17% with three of the symptoms present, that was relatively low compared to global prevalence of severe asthma 6,9% with variation from 3,8% in Asia-Pacific and Northern and Eastern Europe to 11,3% in North America (8). No significant association has been found in our study between gender and neither of the asthma symptoms.

Also in this study we have estimated the use of asthma action plan by adolescent that was 0,6% with no significant association between gender, which represents a low level of education related to asthma monitoring. Asthma action plan includes specific instructions for the proper identification and management of asthma exacerbations as well as the daily medication regime and its use is generally recommended (Evidence B) (18, 19). Several studies suggest that by using asthma action plan can improved asthma control in partially controlled asthma (19-21).

With regard to use of inhaled medication in the past 12 months it was 8,3% with no significant association between gender and mainly their use was only when needed, with a higher rate of use of medication for acute relief of symptoms, SABA, that was 3,7% compared to use of controller medication such as LABA that was 1,8%, ICS with 1,8% and ICS/LABA 1,7%. The low rate of use of inhaled medications and the predominance of the use of ‘relievers’ compared to ‘controller’ medications indicates inadequate treatment, since asthma treatment should includes daily use of a controller drug and use of short-acting bronchodilators when needed for quick symptom relief (1). Previous studies highlighted inconsistencies about the type of treatment use, in the meaning that most of the treated children used bronchodilators for both attacks prevention and therapy (5). According to some reports over 50% of children with asthma symptoms have not received treatment following guidelines (13, 22, 23).

6. CONCLUSION

This study has found moderately low asthma prevalence among adolescents in the southeast region of Kosovo, with no significant association between genders. Although, should be considered as an urgent need the proper examination because asthma seems to be under-diagnosed and also untreated. It’s possible that doctors in our country hesitate to diagnose asthma or the parents themselves and the children deny it. Considering that this is the first study of this type in Kosovo, more extensive research is needed to define these problems.

Strengths and limitations

The results of our study represent basic epidemiological data for asthma at the country level that are suitable for further comparison and also for international comparison with other studies based on ISAAC protocol, contributing to the development of prevention and

Questions	Gender (N=1200)			p	
	Male	Female	Total		
Have you used any inhaled medicines e.g. puffers to help your breathing problems at any time in the past 12 MONTHS (when you didn't have a cold)? (N=1200)					
Yes	N	60	40	100	Pearson Chi-square: 3.1858; df=1; p=0.0743
	%	9.71%	6.87%	8.33%	
No	N	558	542	1100	
	%	90.29%	93.13%	91.67%	
Have you used Short acting β- agonists (SABA) in the past 12 MONTHS? (N=1200)					
Never	N	584	561	1145	Never/ when needed/ in short courses+every day
	%	94.50%	96.39%	95.42%	
When needed	N	26	18	44	
	%	4.21%	3.09%	3.67%	
In short courses	N	3	2	5	Pearson Chi-square: 3.1101; df=2; p=0.2110
	%	0.49%	0.34%	0.42%	
Every day	N	5	1	6	
	%	0.81%	0.17%	0.50%	
Have you used Long acting β- agonists (LABA) in the past 12 MONTHS? (N=1200)					
Never	N	603	573	1176	Never/ when needed+ in short courses
	%	97.57%	98.45%	98%	
When needed	N	13	9	22	
	%	2.10%	1.55%	1.83%	
In short courses	N	2	0	2	Pearson Chi-square: 1.1901; df=2; p=0.2760
	%	0.32%	0%	0.17%	
Every day	N	5	2	7	
	%	0.81%	0.34%	0.58%	
Have you used Inhaled corticosteroids (ICS) in the past 12 MONTHS? (N=1200)					
Never	N	602	571	1173	Never/ when needed/ in short courses+every day
	%	97.41%	98.11%	97.75%	
When needed	N	11	9	20	
	%	1.78%	1.55%	1.67%	
In short courses	N	5	0	5	Pearson Chi-square: 1.2301; df=2; p=0.5420
	%	0.81%	0%	0.42%	
Every day	N	0	2	2	
	%	0%	0.34%	0.17%	
Have you used Combination ICS and LABA in the past 12 MONTHS? (N=1200)					
Never	N	604	573	1177	Never/ when needed+ in short courses
	%	97.73%	98.45%	98.08%	
When needed	N	12	8	20	
	%	1.94%	1.37%	1.67%	
In short courses	N	2	1	3	Pearson Chi-square: 0,8240; df=1; p=0.3640
	%	0.32%	0.17%	0.25%	

Table 3. Inhalation of drugs for breathing problems by gender. *significant for p<0.05

treatment strategies. The strengths of the study include the use of standardized written questionnaires of the GAN phase I developed from ISAAC questionnaires and a large sample size. The limitation of the study is that symptoms are self-reported and we could not confirm with physical and laboratory investigation.

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