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Decreased Prevalence of Allergic Rhinitis, Asthma and Eczema in Riyadh City, Saudi Arabia

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Abstract: Asthma and allergic disorders constitute the common chronic illnesses accounting for huge morbidity in school children worldwide. Current study aims to evaluate the prevalence of rates of asthma, eczema, allergic rhinitis and atopic dermatitis along with food and drug allergy in school children of Riyadh and also to compare with data from previous studies of this region in order to understand their changing trends. Saudi children (1100) aged 6-14 years from Riyadh city, were enrolled and asked to fill Phase 1 model questionnaire of International Study of Asthma and Allergies in Childhood (ISAAC) with help of parents or nurses. The questionnaire also included the diagnosis of similar conditions among parents and first-degree relatives. 27.82% were found to be allergically sensitive, with high prevalence rates for allergic rhinitis, asthma and atopic dermatitis. The total prevalence of allergic rhinitis, asthma, eczema, food and drug allergies in the studied children were 12.7, 11.4, 5.6, 1.75 and 0.27%, respectively. Allergic rhinitis, asthma, eczema are reported to be dominantly prevalent in both parents and siblings of affected children. Decreased prevalence rate of allergic rhinitis, asthma, eczema among children is noted compared to earlier studies in this region. This study results can be helpful as a reference for further studies assessing the childhood allergies in this country.

Key words: Allergies, asthma, allergic rhinitis, eczema, food allergy, drug allergy

INTRODUCTION

Bronchial asthma and other allergic disorders such as allergic rhinitis and eczema are the most common chronic illnesses and responsible for huge morbidity in school children throughout the world (Weinberger *et al.*, 2008). It affects about 10% of school aged children and is an important cause of school absenteeism and reduced participation in sports and other activities. Though genetic factors are known to predispose individuals to asthma and allergic disorders, studies also suggested the environment or the life style as risk factors. Recent studies have emphasized a link between asthma, allergic rhinitis and atopic eczema and prevalence rates of these diseases in children are noted to be increasing with an alarming rate in few Western countries (Robertson *et al.*, 2004; Pearce *et al.*, 2000; Austin *et al.*, 1999).

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Under the guidance Asia Pacific Aeroallergen Working Group, World Allergy Organization (APAWG-WAO) Newsletter, January 2009; aware of the impact of indoor and outdoor allergens in the sensitization and development of allergic diseases such as asthma and allergic rhinitis. This trend has been observed in some Middle Eastern countries also (Janahi *et al.*, 2006; Al-Riyami *et al.*, 2003). Geographical variation in the prevalence rates of childhood asthma, allergic rhinitis, eczema, food and drug allergy are observed throughout the world, from later half of 20th century (Anonymous, 1998; Asher *et al.*, 2001; ISAAC-2 1998). Despite extensive research, the specific causes of increased childhood allergies are not clearly defined. Varied prevalence rates of asthma and allergic diseases have been noted in some populations on two or more occasions following the same study methods (Robertson *et al.*, 1991; Burr *et al.*, 1989; Peat *et al.*, 1994; Omran and Russell, 1996; Von Mutius *et al.*, 1998; Al Frayh *et al.*, 2001; Rona *et al.*, 1995; Anthracopoulos *et al.*, 2001; Goren and Hellmann, 1997). Although there were few studies previously described the respiratory disorders in Saudi children, those trends for allergies in children could not be reliably determined as there were differences in study methodologies in the same or other geographical areas on separate occasions (Al-Dawood, 2000). Rapid industrialization and changed life styles could probably contribute to alteration in prevalence rates of asthma and allergies in Saudi children. More recent studies are needed to assess the current prevalence rates and the effect of time and environmental factors on its trend among Saudi children. Riyadh, the capital city of Saudi Arabia is inland desert dry environment, with a population of more than 4 million and consanguineous marriages are also high among the citizens, due to which greater the chance of genetic influences on allergic disorders among children. The World Asthma Day in King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia, May 2008 was celebrated the event that organized in a public park where hundreds of school children along with their families gathered to attend various awareness programs on causes and prevention of allergic diseases. The current study aims to evaluate the prevalence of rates of asthma, eczema, allergic rhinitis and atopic dermatitis along with food and drug allergy in school children of Riyadh and also to compare with data from previous studies of this region in order to understand the changing trends.

MATERIALS AND METHODS

The present study was conducted during the year 2007-09 using a multistage, stratified, random-sampling technique, by recruiting 1,100 school-age children's aged 6-14 years, which comprised of 815 boys and 285 girls belonging to middle and upper socioeconomic class. The subjects include Saudi male and female students studying in at different schools in Riyadh City, Saudi Arabia. These schools are divided into three educational levels (primary, intermediate and secondary); the age group included in this study falls below secondary levels. Phase 1 model questionnaire of International Study of Asthma and Allergies in Childhood (ISAAC) along with a letter of explanation were distributed and asked to be filled and returned back by parents of these children, who are Saudi nationals by birth and living in Riyadh from past 25 years. Interviews with help of a qualified trained nurse were taken with the parents who are illiterate. Questions related previous history, diagnosis, age at diagnosis and treatment were asked for the identification of asthma among children. Allergic rhinitis was diagnosed by enquiring with questions such as history of sneezing or blocked nose during the last 6 months when he/she did not have a cold or flu and has your child ever had hay fever? Questions concerning the diagnosis of eczema were as follows: has your child ever had an recurrent itchy rash for at least months and has your child ever had

eczema? Food and drug allergies were identified with questions such as the observed symptoms in your child after food ingestion, if any and the kind of food? In your opinion, does your child have a drug allergy? etc. The questionnaire also included the diagnosis of similar conditions among parents and first-degree relatives. Our institutional ethics committee has approved the present study. A signed consent from parents and children's assent was obtained from each subject after explaining the nature of study. Data from all the questionnaires were properly entered in MS-excel spread sheets and was analyzed.

RESULTS AND DISCUSSION

Total prevalence rates for allergic rhinitis, asthma, eczema, food and drug allergies among the studied children were noted to be 12.7, 11.4, 5.6, 1.75 and 0.27%, respectively. Present results demonstrate that Allergic rhinitis is the most common allergic disorders among Saudi children with a frequency of 12.7%; however a previous study conducted in 1996 reported its prevalence as 25% ($p < 0.05$). This significant decrease or variation could be due to reduced exposure of children to intrinsic and/or extrinsic allergens or variation in geographical regions and their climates. This factor could be further supported by the fact that both parents and children showed the similar prevalence rate for allergic rhinitis (12.6 and 12.7%), respectively indicating the exposure to similar allergens. A total of 27.82% of children are allergically sensitive, out of which 85.94% of them showed one type of allergy, whereas the remaining 14.05% were sensitive to more than one type of allergies. Among the different allergies noted in sensitive children, allergic rhinitis, asthma and atopic dermatitis are found to be more prevalent as compared to food and drug allergies. Out of 2343 parents, total prevalence rate of allergic rhinitis is 12.6%, asthma is 3.9%, eczema is 7.72%, food allergy is 0.28% and drug allergy is 0.43%. Allergic sensitivity among parents of studied children was reported as 20.9%, out of them 94.91% were reported to be sensitive to one type of allergy, whereas 5.08% were sensitive to more than one type of allergies. Though, the prevalence rate of Allergic rhinitis in Saudi children as demonstrated is not as high as seen in children of other gulf countries such as Qatar (30.5%), UAE (22.9%), Lebanon (21.2%) and Iran (23.6%), but it is close to the children of Oman (7.4-10.5%) (22-27).

A total of 749 out of 3383 siblings (22.1%), also reported as sensitive to different allergies, out of which 95.99% were sensitive to one type of allergy, whereas 4% were sensitive to more than one type of allergy. Total prevalence rates for allergic rhinitis, asthma, eczema and food and drug allergy among siblings were 9.1, 8, 5.7, 0.40 and 0.38%, respectively (Fig. 1). Allergic rhinitis, asthma, eczema are reported to be dominantly prevalent in both parents and siblings of affected children.

Prevalence of childhood asthma in Saudi Arabia was reported to be increased from 8 to 23% in between 1985-2001 and present results demonstrated the significant reduction in its prevalence i.e., 11.4% in children, while the prevalence rates in siblings and family members were 9.1 and 8.56%, respectively. Asthma prevalence rate as observed in the current study is similar to other studies from Middle Eastern countries, which have also reported its high prevalence among school aged children; wherein it was reported to be 10.5-20% in Oman, 19.8% in Qatar, 16.8% in Kuwait, 14.5% in Iran, 13.6% in UAE and 4.8% in Lebanon (Bener *et al.*, 1994; Al-Riyami *et al.*, 2003; Janahi *et al.*, 2006; Waked and Salameh, 2008). Reduction in the prevalence of both childhood Asthma and Allergic Rhinitis in the last decade could be particularly interesting to clinicians and epidemiologists in identification of risk factors and treatment. The variations in the results of asthma prevalence studies from

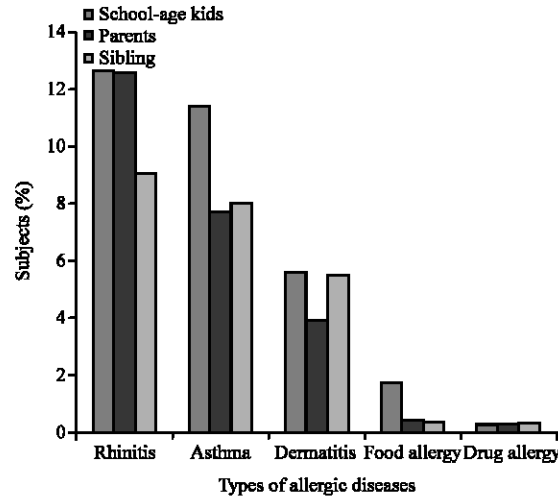


Fig. 1: The distribution the allergy disorders among the study subjects

different countries may be effected not only by the applied protocol, but also by demographic and ethnic, geo-geographic and socioeconomic differences in the study populations.

Eczema formed the third most prevalent allergic disorder among the school children with 5.6% and in siblings it was 5.5%. A 3.6% prevalence rate was found in fathers, while it was 7.7% among mothers but combined prevalence ranged up to 6.2% which includes both children and their family members. Robertson *et al.* (1991) reported the prevalence of eczema to be 8.7% in Jeddah, second major metropolitan city in Saudi Arabia, while Al-Frayh *et al.* (2001) reported it to be in between 12-13%, which is significantly different from our study results. In UAE, eczema was found to be 8.8% in mothers vs. 10.4% in fathers. Other studies have reported that the prevalence of childhood eczema to be 22.5% in Qatar, 11.8% in Lebanon, 7.5-14.4% in Oman, 10.6% in Iran. Present results indicate that Saudi children are comparatively less prone to eczema as compared to other Gulf countries. Among Swedish children, eczema was found to be doubled from 7.05 to 18.28% during 1972-1991 (Dubois *et al.*, 1998), indicating the time associated variations in the prevalence rates of eczema, which could be mostly due to altered environment and/or exposure of different allergens. Food and drug allergies were found least common in children with 1.75 and 0.27%, respectively, while in family members their prevalence rates are 0.35 and 0.38%, respectively hence carry little or no significance.

This cross sectional study highlights the current trend of allergic diseases among school children in Riyadh City, which includes immigrants from all over the kingdom. Study results obtained from this study could also help to set up a base reference for further epidemiological studies in other metropolitan cities of this country. The results can be used for planning methods and means of prevention, education and better planning management of allergy through public health and school programs.

CONCLUSION

We found that allergic rhinitis (12.7%) is most common allergic disorder followed by bronchial asthma (11.4%), eczema (5.6%) in children indicating their significant reduction in

prevalence rates as compared to earlier studies in this region. Food and drug allergies (1.75 and 0.27%) were least common in children and non significant. Periodic studies in different regions of this country will be helpful to obtain a more reliable concept of the prevalence of allergic disorders in Saudi children.

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REFERENCES

- Al-Dawood, K.M., 2000. Epidemiology of bronchial asthma among schoolboys in Al-khobar City, Saudi Arabia: Cross-sectional study. *Croat. Med. J.*, 41: 437-441.
- Al-Frayh, A.R, Z. Shakoor, M.O. Gad El-Rab and S.M. Hasnain, 2001. Increased prevalence of asthma in Saudi Arabia. *Ann. Allergy Asthma. Immunol.*, 86: 292-296.
- Al-Riyami, B.M., O.A. Al-Rawas, A.A. Al-Riyami, L.G. Jasim and A.J. Mohammed, 2003. A relatively high prevalence and severity of asthma, allergic rhinitis and atopic eczema in school children in the sultanate of Oman. *Respirology*, 8: 69-76.
- Anonymous, 1998. Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis and atopic eczema. ISAAC, *Lancet*, 351: 1225-1232.
- Anthracopoulos, M., A. Karatza, E. Liolios, M. Triga, K. Triantou and K. Priftis, 2001. Prevalence of asthma among schoolchildren in Patras, Greece: Three surveys over 20 years. *Thorax*, 56: 569-571.
- Asher M.I., D. Barry, T. Clayton, J. Crane and W. D'Souza *et al.*, 2001. The burden of symptoms of asthma, allergic rhinoconjunctivitis and atopic eczema in children and adolescents in six New Zealand centres: ISAAC Phase One. *N. Z. Med. J.*, 114: 114-120.
- Austin, B.J., B. Kaur, H.R.. Anderson, M. Burr, L.S. Harkins, D.P. Strachan and J.O. Warner, 1999. Hay fever, eczema and wheeze: A nationwide UK study (ISAAC, international study of asthma and allergies in childhood). *Arch. Dis. Child.*, 81: 225-230.
- Bener, A., Y.M. Abdulrazzaq, P. Debuse and J. Al-Mutawwa, 1994. Prevalence of Asthma among Emirates school children. *Eur. J. Epidemiol.*, 10: 271-278.
- Burr, M.L., B.K. Butland, S. King and E. Vaughan-Williams, 1989. Changes in asthma prevalence: Two surveys 15 years apart. *Arch. Dis. Child*, 64: 1452-1456.
- Dubois, P., E. Degraeve and O. Vandenplas, 1998. Asthma and airway hyperresponsiveness among Belgian conscripts, 1978-1991. *Thorax*, 53: 101-105.
- Goren, A.I. and S. Hellmann, 1997. Has the prevalence of asthma increased in children? Evidence from a long term study in Israel. *J. Epidemiol. Community Health*, 51: 227-232.
- ISAAC-2, 1998. Worldwide variations in the prevalence of asthma symptoms: The International Study of Asthma and Allergies in Childhood (ISAAC). *Eur. Respir. J.*, 12: 315-335.
- Janahi, I.A., A. Bener and A. Bush, 2006. Prevalence of asthma among qatari schoolchildren: International study of asthma and allergies in childhood, qatar. *Pediatr. Pulmonol.*, 41: 80-86.
- Omran, M. and G. Russell, 1996. Continuing increase in respiratory symptoms and atopy in Aberdeen schoolchildren. *BMJ*, 312: 34-34.

- Pearce, N., J. Sunyer, S. Cheng, S. Chinn and B. Bjorksten *et al.*, 2000. Comparison of asthma prevalence in the ISAAC and the ECRHS. ISAAC Steering Committee and the European Community Respiratory Health Survey. International Study of Asthma and Allergies in Childhood. *Eur. Respir. J.*, 16: 420-426.
- Peat, J.K., R.H. van den Berg, W.F. Green, C.M. Mellis, S.R. Leeder and A.J. Wolcock, 1994. Changing prevalence of asthma in Australian children. *BMJ.*, 308: 1591-1596.
- Robertson, C.F., E. Heycock, J. Bishop, T. Nolan, A. Olinsky and P.D. Phelan, 1991. Prevalence of asthma in Melbourne schoolchildren: Changes over 26 years. *BMJ*, 302: 1116-1118.
- Robertson, C.F., M.F. Roberts and J.H. Kappers, 2004. Asthma prevalence in Melbourne schoolchildren: Have we reached the peak?. *Med. J.*, 180: 273-276.
- Rona, R.J., S. Chinn and P.G. Burney, 1995. Trends in the prevalence of asthma in Scottish and English primary school children 1982-1992. *Thorax*, 50: 992-993.
- Von Mutius, E., S.K. Weiland, C. Fritsch, H. Duhme and U. Keil, 1998. Increasing prevalence of hay fever and atopy among children in Leipzig, East Germany. *Lancet*, 351: 862-866.
- Waked, M. and P. Salameh, 2008. Asthma, allergic rhinitis and eczema in 5-12-year-old school children across Lebanon. *Public Health*, 122: 965-973.
- Weinberger, M., 2008. Pediatric asthma and related allergic and nonallergic diseases: Patient-oriented evidence-based essentials that matter. *Pediatr. Health*, 2: 631-650.