کارگاه های آموزشی مرکز اطلاعات علمی چهار دانشگاهی

مباهت بیشتر به یادگیری عمیق؛ شبکه های نویج گرافی (Graph Attention Networks)

کارگاه آنلاین آموزش استفاده از وب آ سایتس

کارگاه آنلاین مقاله روزمره انگلیسی

آموزش استفاده از وب آ سایتس

WEB OF SCIENCE

Daily English

مطالعه بررسیه یادگیری عمیق ؛ شبکه های نویج گرافی (Graph Attention Networks)
Associations of Behavioral Disorders with Asthma in Iranian Children

Mohammad Tajdini1, Mohammad Effatpanah2, Majid Zaki-Dizaji1, Masoud Movahedi1, Nima Parvaneh1, Mansoureh Shariat1, and Mohammad Gharagozlou1

1Department of Allergy and Clinical Immunology, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran
2Ziaean Hospital, School of Medicine, International Campus, Tehran University of Medical Sciences, Tehran, Iran

Received: 30 May 2018; Received in revised form: 10 November 2018; Accepted: 18 November 2018

ABSTRACT

Asthma is a common respiratory disease with huge economic burden leading to activity limitations, morbidity, and mortality. In this study, we aim to investigate the prevalence of Oppositional Defiant Disorder (ODD), Attention Deficit Hyperactivity Disorder (ADHD) and Conduct Disorder (CD) among children with asthma.

This case-control study was performed in a pediatric referral health care center (Children's Medical Center in Tehran University of Medical Sciences) in 2017. With random selection, the 80 children with asthma and 92 controls with age range of 5 to 11 years were enrolled in this study. In addition to the demographic information and family history of allergy, asthma symptoms, and control quality evaluated with a validated Childhood Asthma Control Test (C-ACT). The mode of measurement for ADHD, ODD and CD was based on Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) psychiatric scales from clinical interviews conducted by child psychiatrists.

Totally, 42.5% and 25% in the case and control groups had ADHD respectively with significant difference (p=0.01). Also, 25% and 5.4% in the case and control groups had ODD respectively with significant difference (p=0.001). But conduct disorder was 10% and 10.9% in case and control groups respectively without significant difference (p=0.8).

Children with asthma were associated with exhibiting ADHD and ODD but not CD. Therefore, appropriate evaluation and treatment are needed for asthmatic children with attention-deficit and ODD symptoms. Besides, further research is needed to determine the etiological approach towards ADHD, ODD and asthma.

Keywords: Asthma; Attention deficit disorder with hyperactivity; Conduct disorder; Child; Oppositional defiant disorder

INTRODUCTION

Asthma is one of the most common chronic childhood diseases in the respiratory system which is
ADHD and ODD in Asthmatic Children

The inclusion criteria for the case group were the age range of 5 to 11 years, certified asthma diagnosis, and parental consent. The patients with chronic respiratory or somatic disease, mental retardation, epilepsy, visual/auditory disorders, and lack of parental satisfaction for incorporation of children were excluded. Their characteristics are shown in Table 1 and 2. The control group consisted of 92 children matched for age and gender selected from schools by cluster sampling method. The control children had no a family history of atopic diseases and self-history of severe or chronic diseases such as atopic, respiratory, infectious, autoimmune, neurological and psychiatric disorders.

Procedure
The demographic information and self and family history of allergy were recorded. The respiratory function tests were assessed with hand-held spirometer (ZAN 100, Obertulba, Germany) in the case group. Also, a validated Childhood Asthma Control Test (C-ACT) questionnaire was used to assess asthma symptoms and control. Uncontrolled asthma was defined as those with the ACT score of 19 or less. The Child Symptom Inventory-4 (CSI-4) questionnaire11-13 was answered by parents to assess behavioral disorders, and those with abnormal results were recorded and also referred to psychiatrists.

Statistical Analysis
Data analysis was performed by SPSS (version 22.0) [Statistical Procedures for Social Sciences; Chicago, Illinois, USA]. Independent-Sample-T, ANOVA, and Logistic regression tests were used and at P values less than 0.05 were considered statistically significant.

RESULTS

Demographic Characteristics of the Participants
Demographic and respiratory function tests data of 79 asthmatic patients with mean disease duration of 4.047 years (1.6–10.2 years) have been shown in Tables 1 and 2. Mean age of patients and control groups were 7.54 years (5.5-11.8 years) and 7.74 years (5.8-13.5) respectively. The 63.3% and 51.6% in the case and control groups were males respectively (p Value>0.05). There were no significant differences between case and control groups in age and sex factors.

Materials and Methods

Participants
This case-control study was conducted in Children's Medical Center, a pediatric referral health care center at Tehran University of Medical Sciences. During a period of 12 months (February of 2017 to February of 2018), 234 children were invited to study which 171 ones were accepted to participate in the current study. The study was approved by the local ethical committee (approval code: 931168002) and the Helsinki Declaration was respected across the course of the study.
Table 1. Respiratory characteristics of children with asthma in a study on their behavioral disorders (n=79)

| Parameters                              | Mean(SD)     |
|-----------------------------------------|--------------|
| Age at onset                            | 3.77 (+2.32) |
| FEV1%                                   | 85.7 (+14.25) |
| FEV1/FVC%                               | 87.16 (+14.16) |
| MEF.25_75%                              | 78.4 (+15.18) |
| MEF.25_75% rising                       | 14.9 (+9.63)  |
| ACT Score                               | 19.83 (+4.44) |

FEV1: forced expiratory volume 1, FVC: forced vital capacity, MEF: mid-expiratory flow, ACT: Asthma Control Test, MEF.25_75% rising means increase of 25% in response to Bronchodilators: SD, standard deviation

Table 2. Characteristics of children with asthma in a study on their behavioral disorders (n=79)

| Parameters related to asthma | Status | Frequency (%) |
|------------------------------|--------|---------------|
| Exposure to parental smoking | Yes    | 30 (37.9)     |
|                              | No     | 49 (62)       |
| Parental relativeness        | Yes    | 24 (30.3)     |
|                              | No     | 55 (69.6)     |
| Family History of Atopy      | Yes    | 55 (69.6)     |
|                              | No     | 24 (30.3)     |
| Bronchodilators Response     | Negative | 16 (20.2) |
| (increase of FEV1≥12%)        | Positive | 62 (78.4) |
| Inhalational Steroids        | Fluticasone | 52 (65.8) |
|                              | Beclomethasone | 5 (0.06) |
|                              | Budesonide | 22 (27.8) |
| Rhinitis History             | Yes    | 59 (74.6)     |
|                              | No     | 20 (25.3)     |
| Eczema History               | Yes    | 21 (26.5)     |
|                              | No     | 58 (73.4)     |
| Emergency attending in past year | Disease uncontrolled (2 and more) | 5 (0.06) |
|                              | Disease controlled (< 2) | 74 (93.6) |
| Steroid use times in past year | Disease uncontrolled (3 and more) | 15 (19) |
|                              | Disease control (< 3) | 64 (81) |
| Attack times in past 6 months | Disease uncontrolled (2 and more) | 32 (40.5) |
|                              | Disease controlled (< 2) | 47 (59.4) |
| School Absences Times in past year | <3 | 34 (43) |
|                              | ≥3     | 45 (57)       |

FEV1: forced expiratory volume 1

The Prevalence of ADHD in Asthma

Totally 42.5% (34 cases) and 25% (23 cases) in the case and control groups had ADHD respectively with significant difference (p=0.01). This deference also was seen in all ADHD subtypes including attention deficit (p=0.005), hyperactivity (p=0.006) and combined (p=0.01). Among respiratory and demographic factors FEV1/FVC (p=0.007), steroid use frequency (p=0.04) and school absence times in the past year (p=0.01) associated with hyperactivity type. Also, Logistic regression test among respiratory function tests showed MEF.25-75% (p=0.004), MEF.25-75% rising
ADHD and ODD in Asthmatic Children

(p=0.003) and steroid use frequency (p=0.006) could predict attention deficit type, and MEF.25-75% rising (p=0.04) and male gender (p=0.01) could predict hyperactivity type of ADHD.

The Prevalence of ODD and CD in Asthma

The 25% (20 cases) and 5.4% (5 cases) in the case and control groups respectively had ODD with significant difference (p=0.001). Among respiratory and demographic factors, school absence times in the past year (p=0.024) and emergency attending in the past year (p=0.042) could predict ODD in asthma patients.

Totally, 10% (8 cases) and 10.9% (10 cases) in case and control groups had conduct disorder respectively without significant difference (p=0.8).

DISCUSSION

To the best of our knowledge, this is the first study of psychiatric and behavioral disorders in Iranian asthmatic children. Asthma is an important cause of morbidity and disability in individuals and the control of this disease worsens at alter age, which is also associated with increased emergency medicine as well as hospitalizations.\(^{15}\)

Psychiatric and mental symptoms would result in the higher severity of asthma, further health care costs, functional impairments, and non-optimal asthma control.\(^{6,8}\) Also, comorbidity would result in a higher recurrence rate.\(^{16}\)

This study demonstrated the high prevalence of ADHD and ODD in asthma patients in comparison to controls. But conduct disorder frequency was not significantly different between the two groups.

Over the last decades, the hypothesis has been raised that an atopic response could result in the development of attention-deficit/hyperactivity disorder (ADHD).\(^{25}\) Both ADHD and atopic disorders (i.e., asthma, atopic eczema, and allergic rhinitis) are complex disorders in which genetic factors, as well as environmental factors, play a major role.\(^{16,17}\)

Currently, the etiologic pathways of the possible association between atopic diseases like asthma and ADHD are still not well understood. Several cross-sectional studies determined an association between asthma and ADHD. A systematic review by Schmitt et al\(^{18}\) concluded that only eczema was independently associated with ADHD among the atopic diseases and positive association between asthma and ADHD was at least partly confounded by eczema which precedes asthma and allergic rhinitis in the atopic procession. However, after this review, several studies found a positive association between asthma and ADHD independent of eczema.\(^{19-22}\)

Recently a comprehensive systematic review and meta-analyses by Schans et al.\(^{15}\) found overall odds ratio of children having asthma compared to the children without asthma and the odds of ADHD onset was 1.34 (95% CI 1.24–1.44).

It has been demonstrated that asthmatic children exhibit more symptoms of hyperactivity/impulsivity in adolescence than controls.\(^{23}\) Holmberg et al\(^{23}\) studied multiple types of asthma and ADHD concluded that asthma was associated equally with attention and hyperactivity and the association was not restricted to either of the two dimensions of ADHD. Also, Yi-Tsen et al\(^{24}\) demonstrated that children (aged 9–10 y old) having symptoms of asthma within the past 1 y were associated with having all dimensions of symptoms of ADHD. In our study asthma associated with attention and hyperactivity but not combined type. This discrepancy may be due to sampling size, asthma control quality, and age range. Additionally, these differences especially sample size may be a reason that the prevalence of ADHD in our control group is higher than the local\(^{25,27}\) and global reports.\(^{28}\)

Children with ODD show an ongoing pattern of extreme negativity, hostility, and defiance lasting for at least 6 months. Without appropriate management, ODD may progress to conduct disorder, law-breaking, and illicit substance usage. It has been documented that parental marital conflicts, low socioeconomic status, household second-hand smoke or prenatal tobacco exposure, and preterm birth are related to ADHD or ODD. Uncontrolled ADHD and ODD may result in several complications, including the persistence of symptoms into adolescence or adulthood, poor social skills, depression, or even criminal activity.\(^{29}\)

Saricoban et al\(^{29}\) in a study of 409 patients with a mean age of 9.0±2.67 years did not find significant prevalence difference in hyperactivity, ADHD, and ODD between the study and control groups, however, they suggested that rather than asthma itself, adjunctive use of leukotriene antagonist (LA)+inhaled corticosteroids (ICS) therapy appears to be related with symptoms of common behavioral problems, including hyperactivity, attention deficit, ADHD, and ODD and to increase the risk of ODD. Two cross-sectional studies of children aged 5–15 years\(^{30}\) and 3-15 years\(^{31}\)
found an increased risk of conduct problems among children with asthma. These studies were population-based on parent report or self-report of both asthma and mental health problems using Strengths and Difficulties Questionnaire (SDQ). A population-based birth cohort study on children at ages 5–17 years found a population-based sample of children with mean age 10.4 years found similar associations between asthma and conduct problems. Our study found an association between asthma and ODD but not conduct disorder. This might be explained by relatively small samples, lack of adjustment for potential confounders, cultural differences and the quality of control in the patients.

Our limitations were low cooperation of families, small sample size, difficulties to attain socioeconomic data, and lack of data about the quality of care from patients in the past year. Moreover, parent relativity may affect the incidence of inherited psychological disorders in a population. Unfortunately, this study did not cover this issue. Additionally, behavioral problems in patients with asthma may be partly because of the side effects of therapeutic interventions. However, the reason for this process is not completely understood, but it appears that these treatments shrink the hippocampus volume.

In the end, according to the obtained results, it may be concluded that ADHD and ODD are related to asthma, but there is no significant association between CD and asthma. However, further studies with larger sample size and with the consideration of socioeconomic status and the quality of care from patients in past year and also an assessment of asthma severity in addition to assessment of atopy in control subjects with laboratory methods are suggested.

REFERENCES

1. Boulet LP, Boulay ME. Asthma-related comorbidities. Expert Rev Respir Med 2011; 5(3):377-93.
2. Reddel HK, Bateman ED, Becker A, Boulet LP, Cruz AA, Drazen JM, et al. A summary of the new GINA strategy: a roadmap to asthma control. Eur Respir J 2015; 46(3):622-39.
3. Lotvall J, Akdis CA, Bacharier LB, Bjerner L, Casale TB, Custovic A, et al. Asthma endotypes: a new approach to classification of disease entities within the asthma syndrome. J Allergy Clin Immunol 2011; 127(2):355-60.
4. Goodwin RD, Robinson M, Sly PD, McKeague IW, Susser ES, Zubrick SR, et al. Severity and persistence of asthma and mental health: a birth cohort study. Psychol Med 2013; 43(6):1313-22.
5. Lin YT, Chen YC, Gau SS, Yeh TH, Fan HY, Hwang YY, et al. Associations between allergic diseases and attention deficit hyperactivity/oppositional defiant disorders in children. Pediatr Res 2016; 80(4):480-5.
6. McCauley E, Katon W, Russo J, Richardson L, Lozano P. Impact of anxiety and depression on functional impairment in adolescents with asthma. Gen Hosp Psychiatry 2007; 29(3):214-22.
7. Morrison KM, Goli A, Van Wagoner J, Brown ES, Khan DA. Depressive Symptoms in Inner-City Children With Asthma. Prim Care Companion J Clin Psychiatry 2002; 4(5):174-7.
8. Richardson LP, Russo JE, Lozano P, McCauley E, Katon W. The effect of comorbid anxiety and depressive disorders on health care utilization and costs among adolescents with asthma. Gen Hosp Psychiatry 2008; 30(5):398-406.
9. ten Brinke A, Sterk PJ, Mascalfe AA, Spinhoen P, Schmidt JT, Zwinderman AH, et al. Risk factors of frequent exacerbations in difficult-to-treat asthma. Eur Respir J 2005; 26(5):812-8.
10. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, DSM-IV. 4th edition, 4th text rev. Washington, DC: American Psychiatric Association; 2000.
11. Sprafkin J, Gadow KD, Salisbury H, Schneider J, Loney JJJoCC, Psychology A. Further evidence of reliability and validity of the Child Symptom Inventory-4: Parent.J Clin Child Adolesc Psychol 2002; 31(4):513-24.
12. Ahmadi N, Mohammadi MR, Araghi SM, Zarafshan H. Neurocognitive Profile of Children with Attention Deficit Hyperactivity Disorders (ADHD): A comparison between subtypes. Iran J Psychiatry 2014; 9(4):197-202.
13. Looyeh MY, Kamali K, Shafieian R. An exploratory study of the effectiveness of group narrative therapy on the school behavior of girls with attention-deficit/hyperactivity symptoms. Arch Psychiatr Nurs 2012; 26(5):404-10.
14. Banerji A, Clark S, Afilalo M, Blanda MP, et al. Prospective multicenter study of acute asthma in younger versus older adults presenting to the emergency department. J Am Geriatr Soc 2006; 54(1):48-55.
15. Schans JV, Cicek R, de Vries TW, Hak E, Hoekstra PJ. Association of atopic diseases and attention-deficit/hyperactivity disorder: A systematic review and meta-analyses. Neurosci Biobehav Rev 2017; 74(Pt A):139-48.
ADHD and ODD in Asthmatic Children

16. Elia J, Sackett J, Turner T, Schardt M, Tang SC, Kurtz N, et al. Attention-deficit/hyperactivity disorder genomics: update for clinicians. Curr Psychiatry Rep 2012; 14(5):579-89.

17. Froehlich TE, Anixt JS, Loe IM, Chirdkiatgumchai V, Kuan L, Gilman RC. Update on environmental risk factors for attention-deficit/hyperactivity disorder. Curr Psychiatry Rep 2011; 13(5):333-44.

18. Schmitt J, Buske-Kirschbaum A, Roessner V. Is atopic disease a risk factor for attention-deficit/hyperactivity disorder? A systematic review. Allergy 2010; 65(12):1506-24.

19. Chen MH, Su TP, Chen YS, Hsu JW, Huang KL, Chang WH, et al. Asthma and attention-deficit/hyperactivity disorder: a nationwide population-based prospective cohort study. J Child Psychol Psychiatry 2013; 54(11):1208-14.

20. Tsai JD, Chang SN, Mou CH, Sung FC, Lue KH. Association between atopic diseases and attention-deficit/hyperactivity disorder in childhood: a population-based case-control study. Ann Epidemiol 2013; 23(4):185-8.

21. Hak E, de Vries TW, Hoekstra PJ, Jick SS. Association of childhood attention-deficit/hyperactivity disorder with atopic diseases and skin infections? A matched case-control study using the General Practice Research Database. Ann Allergy Asthma Immunol 2013; 111(2):102-6.

22. Mogensen N, Larsson H, Lundholm C, Almqvist C. Association between childhood asthma and ADHD symptoms in adolescence - a prospective population-based twin study. Allergy 2011; 66(9):1224-30.

23. Schmitt J, Chen CM, Apelbacher C, Romanos M, Lehmann I, Herbarth O, et al. Infant eczema, infant sleeping problems, and mental health at 10 years of age: the prospective birth cohort study LISApplus. Allergy 2011; 66(3):404-11.

24. Holmberg K, Lundholm C, Anckarsater H, Larsson H, Almqvist C. Impact of asthma medication and familial factors on the association between childhood asthma and attention-deficit/hyperactivity disorder: a combined twin-and register-based study: Epidemiology of Allergic Disease. Clin Exp Allergy 2015; 45(5):964-73.

25. Safavi P, Ganji F, Bidad A. Prevalence of Attention-Deficit Hyperactivity Disorder in Students and Needs Modification of Mental Health Services in Shahrekord, Iran in 2013. J Clin Diagn Res. 2016; 10(4):LC25-8.

26. Talaei A, Mokhber N, Abdollahian E, Bordbar MR, Salari E. Attention deficit/hyperactivity disorder: a survey on prevalence rate among male subjects in elementary school (7 to 9 years old) in Iran. J Atten Disord 2010; 13(4):386-90.

27. Shooshtary MH, Chimeh N, Najafi M, Mohamadi MR, Yousefi-Nouraei R, Rahimi-Movaher A. The prevalence of Attention Deficit Hyperactivity Disorder in Iran: A systematic review. Iran J Psychiatry 2010; 5(3):88-92.

28. Attention-Deficit / Hyperactivity Disorder (ADHD) Centers for Disease Control and Prevention [updated March 20, 2018]. Available from: https://www.cdc.gov/ncbddd/adhd/data.html.

29. Saricoban HE, Ozen A, Harmanci K, Razi C, Zehmacioglu O, Cengizlier MR. Common behavioral problems among children with asthma: is there a role of asthma treatment? Ann Allergy Asthma Immunol 2011; 106(3):200-4.

30. Calam R, Gregg L, Goodman R. Psychological adjustment and asthma in children and adolescents: the UK Nationwide Mental Health Survey. Psychosom Med 2005; 67(1):105-10.

31. Hammer-Helmich L, Linneberg A, Obel C, Thomsen SF, Tang Mollehave L, Glumer C. Mental health associations with eczema, asthma and hay fever in children: a cross-sectional survey. BMJ Open 2016; 6(10):e012637.

32. Annesi-Maesano I, Zhou C, Baiz N, Banerjee S, Andre Charpin D, Caillaud D, et al. Externalizing and internalizing behavioural problems related to asthma in school children. Allergy 2013; 68(11):1471-4.

33. Frol AB, Vasquez A, Getahun Y, Pacheco M, Khan DA, Brown ES. A comparison of clinician-rated neuropsychological and self-rated cognitive assessments in patients with asthma and rheumatologic disorders. Allergy Asthma Proc 2013; 34(2):170-5.
کارگاه های آموزشی مرکز اطلاعات علمی جهاد دانشگاهی

مباحث پیشرفته یادگیری عمیق؛ شبکه های توجه گرافی (Graph Attention Networks)

کارگاه آنلاین آموزش استفاده از وب آسیان

کارگاه آنلاین مقاله روزمره انگلیسی

Daily English

انتشارات روزمره اکتیپس