EFFECT OF PHYSICIAN - PATIENT COMMUNICATION THROUGH REGULAR FAMILY VISITS ON LEVEL OF ASTHMA CONTROL

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ABSTRACT

Background: *Successful physician-patient communication through home visit can help asthmatic patients better manage their condition and enhance adherence.* ***(American Academy of Asthma Allergy & Immunology between 2001).***

Objectives: *We aimed to assess the impact of physician –patient communication through regular family visit on level of asthma control.*

Design: *This is a Case control cross section based study that was carried out on 100 uncontrolled asthmatic children attending Outpatient Clinic of Chest and Allergy Unit of Pediatric Department, Al Hussein University Hospital. The asthmatic patients were recruited from Al-Hussein pulmonology and allergy outpatient clinics, from October 2016 to June 2017.*

Patient And Methods*: Uncontrolled asthmatic patients were randomly assigned to either the intervention group or the control group.* ***Group1:*** *50 uncontrolled asthmatic infants and children with regular family visit for 8 weeks (case group).* ***Group2:*** *50 uncontrolled asthmatic infants and children without regular family visit (control group).*

Results: *During first 3 visits of follow up period; both home visits group and non-home visits group experienced greater reductions in symptoms of asthma , level of uncontrolled asthma and severity of asthma with statistically insignificant difference between both group (p>0.05). During 4th ,5th and 6th visits of follow up period; Asthma proper control was significantly more prevalent among asthmatics with home intervention compared to those with clinic follow up only (p=0.040, 0.001and 0.001 for 4th ,5th and 6th visits respectively) with 6.66±1.527 in patients with uncontrolled asthma followed by 12.33±3.21 in patients with partly controlled asthma followed by 31±3.605 in patients with controlled asthma among asthmatics with home intervention while the control group in patients with uncontrolled asthma was 21.66±3.055 followed by 13.33±3.51 in patients with controlled asthma followed by 15±3 in patients with partly controlled asthma. Also during last 2 visits of follow up period; Asthma proper control was highly significantly more prevalent among asthmatics with home intervention compared to those with clinic follow up only (p=0.001 for 7th and 8th*

visits) with 5±1.414 in patients with uncontrolled asthma followed by 12.5±2.121 in patients with partly controlled asthma followed by 32.5±3.535 in patients with controlled asthma among asthmatics with home intervention while the control group, in patients with uncontrolled asthma was 18±1.41followed by 13.33±3.51 in patient with controlled asthma followed by 15±3 in patients with partly controlled asthma.

Conclusion: *Asthma proper control was highly more prevalent among asthmatics with home intervention and this support that improving the health of a child with asthma requires a multi-faceted strategy that addresses the physical home environment, health-care utilization and medication adherence.*

Keywords: *Pediatric bronchial asthma, Home intervention study, Asthma Control Test, Asthma Action Plan.*

INTRODUCTION

Asthma is a heterogeneous chronic inflammatory disease, characterized by recurrent episodes of wheezing, dyspnea, chest tightness, and cough, that is very common in children and adolescents ***(GINA, 2014).***

It is a global health problem that affects around 300 million individuals of all ages, ethnic groups, and countries ***(Bousquet et al., 2010).***

It is estimated that 250,000 people die prematurely each year as a result of asthma ***(Bousquet et al., 2010).***

It is the first cause of absenteeism from schools and the third cause of hospitalization of children under 15 years of age in hospitals ***(Hockenberry and Wilson 2010***).

The diagnosis of asthma in young children is based on individual history, physical examination and their response to treatment as not all children are able to perform spirometry or impulse oscillometry ***(Expert Panel Report 3, 2013).***

Because the risk, severity, and control of asthma are all influenced by a combination of genetic, social, and environmental factors, reducing the impact of the condition has proven difficult ***(National Heart, Lung, and Blood Institute, 2012).***

Asthma control refers to control of the manifestations of disease and also control of the expected future risk to the patient such as exacerbations, accelerated decline in lung function, and side effects of treatment. The aim of treatment should be to achieve and maintain control for prolonged periods ***(Bateman et al., 2004).***

Home-based environmental interventions involve trained personnel making one or more visits to conduct prevention activities in

the home with an asthma client. ***(Morgan et al, 2004).***

Key components of self-management education should be reviewed regularly and include the following: basic information about asthma; patient's current level of control; what well controlled asthma looks like; types and roles of medications; inhaler technique; how to recognize and handle worsening asthma; when to seek medical advice; and control of triggers ***(BTS, 2011).***

Successful physician-patient communication through home visit can help patients better manage their condition and enhance adherence. Because many asthma symptoms are subjective, it is important to allow sufficient time for discussion of symptoms, especially when an asthma exacerbation or its follow-up care is the reason for the visit ***(American Academy of Asthma Allergy & Immunology between 2001).***

Self-management education that includes a written Asthma Action Plan appears to be more effective than other forms of self-management education, although more research is needed to confirm the independent contribution of AAP to the overall effect on asthma outcomes ***(Ducharme et al., 2011).***

AIM OF THE WORK

The aim of this study was to assess the impact of physician – patient communication through regular family visits on level of asthma control.

PATIENT AND METHODS

This is a case control cross section based study; it was carried out on 100 uncontrolled asthmatic children attending Outpatient Clinic of Chest and Allergy Unit of Pediatric Department, Al Hussein University Hospital during the period from October 2016 to June 2017.

100 uncontrolled asthmatic patients according to **(GINA 2014)** were classified into two groups:

- **Group 1:** 50 uncontrolled asthmatic infants and children with regular family visit for 8 weeks **(case group).**
- **Group 2:** 50 uncontrolled asthmatic infants and children without regular family visit **(control group).**

Inclusion Criteria: were:

- Age: 1:15year.
- Uncontrolled asthmatic patient.

EXCLUSION CRITERIA: were:

- Age: below1 year and above 15 year.

- Single attack of wheeze or cough or difficulty of breathing.
- Controlled asthmatic patient.

Financial Disclosure /Funding:

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Ethical Consideration:

1. A written informed consent was obtained from patients or their legal guardians.
2. An approval by the local ethical committee was obtained before the study.
3. The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.
4. All the data of the patients and results of the study are confidential and the patients have the right to keep it.

All cases & controls were subjected to Full history and thorough clinical examination:-

***A. Careful history taking stressing on*:**

Demographic data, environmental tobacco smoking exposure, symptoms of asthma (cough, wheezing, shortness of breath, exercise intolerance), family history of asthma or other atopy, age of onset and duration of illness, asthma severity, level of control and medications in the asthma.

B. General examination:

To exclude other systemic illness from study laying stress on pallor, cyanosis and respiratory rate.

Families in the control group received clinic visits for evaluation and regulation of medications according to level of control and severity of asthma throughout the study.

Families in the case group received regular home visits throughout the study .During first visit; a visual inspection of the home was conducted. To complete the home inspection, the investigator followed the aforementioned protocol to complete a room-by-room inspection of the home, looking for health and safety hazards (also known as: healthy homes issues). All rooms and room equivalents (e.g., hallways and stairways) were documented and were examined. Also Case group had a written asthma action plan developed by the patient and physician. Plan addressed symptom severity, appropriate use of medication, and how to identify when emergency care is needed. During each visit, we confirmed

that patients and their families are able to recognize symptom patterns, can identify contributing factors and how to avoid them, and learn how to control exacerbations. It was important to review the asthma action plan thoroughly and evaluate recent asthma control (through asthma control test) and address any patient questions to ensure clarity concerning guidelines for managing exacerbations, recommendations and techniques for the use of medication, and when emergency medical intervention was necessary. This included repetitive teaching of skills such as use of metered dose inhalers, spacers, and nebulizers.

Statistical Analysis:

Data were collected, coded, revised and entered to the statistical package for social science (SPSS) version 20. Qualitative data were presented as number and percentages while quantitative data were presented as mean, standard deviation and range. The comparison between two groups with quantitative and parametric data was done by using independent t-test. The comparison between more than two groups with quantitative and parametric data was done by using one way analysis of variance (ANOVA) test. Spearman correlation coefficient were used to assess the relation between two parameters in the same group. P value below 0.05 was considered significant.

RESULTS

Table (1): Comparison of age on onset cases and control.

Age in months	Cases	Control	t	P
<6	2	6	**1.588**	**0.115**
6-	18	19		
12-	9	13		
18-	7	2		
24-	5	6		
30+	9	4		
Range	2-144	3-60		
Mean+ SD	19.76+21.83	14.24+11.28		

SD = standard deviation.
P< 0.05 = statistically significant, **p < 0.01** = statistically highly significant,

p >0.05= statistically insignificant.

Table (1): showing that There was statistically insignificant difference between studied home visits and non-home visits of uncontrolled asthmatic patients concerning age of onset; p>0.05. Mean age of onset was 19.76+21.83 for case group and 14.24+11.28 for control group.

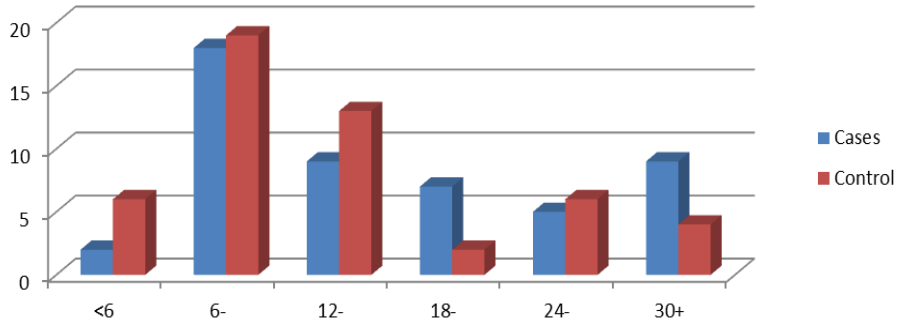

Figure (1): Column charts showing Comparison of age on onset cases and control.

Table (2): Comparison of studied groups in relation to risk factors.

Variables	Case group	Control group	X^2	p
Respiratory infections	36	36	**0.000**	**1.000**
Exposure to tobacco smoking	27	28	**0.040**	**0.841**
Exposure to dust	32	27	**1.033**	**0.309**
Intake of drugs	6	7	**0.088**	**0.766**
Food allergy	18	13	**1.169**	**0.280**
Allergy to odors	33	27	**1.500**	**0.221**
Exercise induced asthma	15	12	**0.457**	**0.499**
Emotional as risk factor	8	5	**0.796**	**0.372**

X^2 = chi square test.
P< 0.05 = statistically significant, **p < 0.01** = statistically highly significant,
p >0.05= statistically insignificant.

Table (2): showing that there was statistically insignificant difference between studied home visits and non-home visits of uncontrolled asthmatic patients concerning risk factors; p>0.05.

Table (3): Comparison of diagnosis of asthma among home visits and non-home visits groups during first 3 visits of follow up period.

Diagnosis of asthma	Home visits	Non-home visits	X^2	P
Visit 1				
Uncontrolled	13	14		
Partly controlled	25	18	**2.377**	**0.305**
Controlled	12	18		
Visit 2				
Uncontrolled	8	13		
Partly controlled	10	16	**4.858**	**0.088**
Controlled	32	21		
Visit 3				
Uncontrolled	8	18		
Partly controlled	12	12	**5.846**	**0.054**
Controlled	30	20		

X^2 = chi square test.
P< 0.05 = statistically significant, **p < 0.01** = statistically highly significant,
p >0.05= statistically insignificant.

Table (3): showing that ***during first 3 visits of follow up period*;** both home visits group and non-home visits group experienced greater reductions in symptoms of asthma and level of uncontrolled asthma. For example during 3rd visit of follow up, 30 children who received home intervention were diagnosed as control asthma while 20 children who received non home intervention were diagnosed as control asthma.

Table (4): Comparison of diagnosis of asthma among home visits and non-home groups during second 3 visits of follow up period.

Diagnosis of asthma	Case group	Control group	x^2	P
Visit 4				
Uncontrolled	7	21		
Partly controlled	16	12	9.844	**0.007**
Controlled	27	17		
Visit 5				
Uncontrolled	5	19		
Partly controlled	11	18	19.239	**0.001**
Controlled	34	13		
Visit 6				
Uncontrolled	8	25		

Partly controlled	10	15		
Controlled	32	10	21.281	**0.001**

X² = chi square test.
P< 0.05 = statistically significant, **p < 0.01** = statistically highly significant,
p >0.05= statistically insignificant.

Table (4): showing that ***During 4th ,5th and 6th visits of follow up period;*** Asthma proper control was significantly more prevalent among asthmatics with home intervention compared to those with clinic follow up only (p=0.040, 0.001and 0.001 for 4th, 5th and 6th visits respectively).

Table (5): Comparison of diagnosis of asthma among home visits and non-home groups during last 2 visits of follow up period.

Diagnosis of asthma	Case group	Control group	x²	P
Visit 7				
Uncontrolled	6	19		
Partly controlled	14	19	**15.232**	**0.001**
Controlled	30	12		
Visit 8				
Uncontrolled	4	17		
Partly controlled	11	17	**16.412**	**0.001**
Controlled	35	16		

X² = chi square test.
P< 0.05 = statistically significant, **p < 0.01 =** statistically highly significant,
p >0.05= statistically insignificant.

Table (5): showing that ***Also during last 2 visits of follow up period***; Asthma proper control was highly significantly more prevalent among asthmatics with home intervention compared to those with clinic follow up only (p=0.001 for 7th and 8th visits).

Table (6): Comparison of studied groups in relation to hospital admission during follow up:

Hospital admission	Home visits	Control	P
None	**42**	**39**	

Once	**7**	**7**	**0.500**
More than once	**1**	**4**	

P< 0.05 = statistically significant, **p < 0.01 =** statistically highly significant, **p >0.05=** statistically insignificant.

Table (6): showing that There was statistically insignificant difference between studied home visits and non-home visits of uncontrolled asthmatic patients concerning hospital admission during follow up period ; p=0.05.

DISCUSSION

This is across-sectional study aimed to assess the impact of physician-patient communication through regular family visit on level of asthma control.

In present study; asthma was more prevalent among males than females and this is in agreement with some studies as ***William et al., (2014), Newachecke et al., (2000) and Halim et al., (2013)*** revealed that male gender is associated with an increased risk of developing asthma; boys are 1.5 to 2 times more likely than girls to develop asthma.

The exact reason for male predominance is not known but male predominance may be related to a greater degree of bronchial liability in males. Airways in boys are also smaller in comparison to their lung sizes when compared to girls ***(Sears et al., 1993).***

In this study; asthma was more prevalent among children aged ≥ 6 years (n=82) and mean age was 4.74+4.24 for case group and 3.52+1.99 for control group and this is in agreement with ***Liu et al.,(2015)*** revealed that Approxi-mately 80% of all asthmatic patients report disease onset prior to 6 yr. of age.

It is possible that factors triggering asthma are increasingly affecting very young children. This is either because these unknown etiological factors affect only young children or because older children are already ‘‘saturated’’in their exposures, thereby explaining a stable rate of asthma in this older population ***(pearce et al., 2007).***

The duration from onset of asthma symptoms to index date of asthma varies significantly depen-ding on host and environmental factors. In the current study the mean duration from onset of

asthma symptoms was 19.76+ 21.83 for case group and 14.24+ 11.28 for control group, in disagreement with ***Abdullah et al., (2012)*** who found that, the mean duration from onset of asthma symptoms was 9.02 ± 5.04.

Genetics can play a role in triggering asthma. If asthma runs in the family, the chances are higher that younger generations will also contract the disease ***(GINA 2005).***

In the present study, the findings revealed that, positive family history of asthma and other allergy was significantly associated risk factors for asthma (n= 73), in agreement with other studies as ***Zedan et al., (2009), Abdullah et al., (2012) and Halim et al., (2013).***

This can be explained by the fact that asthma is a syndrome influenced by genetic and environmental factors ***(Basic Asthma Research Strategy II [BARS II], 2006).***

In the present study; the presence of one type or more of other allergic diseases were significantly associated with asthma, in agreement with other studies as ***Yasein et al., (2004), Behl et al., (2010) and Abdullah* et *al., (2012)*** and association with other allergic diseases in this study (72 %) was higher than found by ***Hossny et al., (2009)*** that 53.3% of asthmatic children had associated allergic disease (atopic dermatitis, allergic rhinitis or food allergy).

Triggers differ between individuals and may change overtime. Overall the top five triggers for asthma symptoms were cold or infection, exercise, Tobacco smoke, dust and pollen **(*The National Asthma Control Task Force, 2000).***

In the current study, the most common triggering factors were; respiratory infection, dust, smoke, odor and insecticide, physical effort, food and drinks and drugs in agreement with other studies as ***Surdu et al., (2006).***

In the present study; respiratory infection was the most dominant risk factors (72 %) and this is in agreement with a study conducted by ***Nafstad et al., (2000)*** revealed that, the children who experience any respiratory infections during infancy have a higher risk of asthma later in childhood. ***Also Busse et al., (2010)*** reported that, the viral respiratory infections during the early years of life appear to be the dominant risk factor associated with the development and exacerbation of asthma.

This can be explained by

suggesting that the impact of infant and preschool viral infections on the maturing immune system and developing lung that subsequently result in an asthma phenotype occur during a critical susceptibility period, and in a genetically susceptible host ***(Sigurs et al., 2000).***

Previous studies have demonstrated that effective healthy homes intervention programs require multiple home visits ***(Dixon et al., 2009).***

In the present study; we found that a home-based intervention focused on reducing exposure to multiple indoor allergens and environmental tobacco smoke decreased reported symptoms so Asthma proper control was more prevalent among asthmatics with home intervention and level of severity was highly lower among asthmatics with home intervention and this is in agreement with a study conducted by ***Morgan et al., (2004).***

This can be explained by suggesting that home-based asthma intervention includes: the assessment of exposures to asthma triggers, education about exposure avoidance and asthma control (including the proper use of medications), as well as providing low-cost tools and strategies to reduce exposures ***(Song, & Weaver, 2005).***

In the present study; the risk of hospitalization was not significantly changed and this is in agreement with a study conducted by ***Morgan et al., (2004).***

This finding was surprising, particularly because the services provided through home environment programs are generally more intensive in terms of dosage (for example, the number of interactions with caregivers and children), the provision of supplies (such as HEPA-filter vacuums and "safe" cleaning kits), and connections to other service providers (such as integrated pest management and mold removal services) ***(Helen et al., 2016).***

CONCLUSION

Asthma proper control was highly more prevalent among asthmatics with home intervention and this support that improving the health of a child with asthma requires a multi-faceted strategy that addresses the physical home environment, health-care utilization, medication adherence, and other extrinsic factors (e.g., health behaviors and caregiver involvement).

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تأثير اتصال الطبيب بالمريض من خلال الزيارات العائلية المنتظمة على مستوى التحكم فى حساسية الصدر لدي الأطفال

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الهدف: الهدف من هذه الدراسة هو تقييم أثر الاتصالات بين المريض و الطبيب من خلال الزيارات العائلية المنتظمة على مستوى التحكم في الربو.

المنهجية: تم إجراء هذه الدراسة على 100 طفلا ممن يعانون من الربو والذين تم تشخيصهم وفقا للمبادئ الإرشادية ل(GINA 2014) ، وتم اختيار الحالات من عيادة الحساسية والمناعة في مستشفى الحسين الجامعي.

- تم تصنيف جميع المرضى إلى مجموعين :-

أ- 50 طفل يعانون من الربو على نحو غير منضبط ويتلقون زيارات منزلية منتظمة لمدة 8 أسابيع (مجموعة الحالة)

ب- 50 طفل يعانون من الربو على نحو غير منضبط ولا يتلقون زيارات عائلية .

- تم الحصول على موافقة كتابية لكل حالة قيد الدراسة وتمت الموافقة على إجراء الدراسة بواسطة لجنة الأخلاقيات بكلية الطب، جامعة الأزهر.

النتائج:

- خلال أول 3 زيارات من فترة المتابعة, فقد شهدت كل من الزيارات المنزلية الغير منزلية تقليل كبير فى كل من أعراض الربو ومستوى الربو غير المنضبط وشدة الربو مع عدم فروق ذات دلالة إحصائية بين كل من المجموعتين($p> 0.05$).
- خلال الزيارات الرابعة والخامسة والسادسة من فترة المتابعة, كانت نسبة انضباط مستوى الربو أكثر انتشارا بين مرضى الربو مع التدخل المنزلي مقارنة مع المرضى الذين يتابعون العيادة فقط ($p = 0.040$، 0.001 و 0,001 للزيارات الرابعة والخامسة والسادسة على التوالي) مع 6,66 ± 1,527 في المرضى الذين يعانون من الربو غير المنضبط تليها 12,33 ± 3,21 في المرضى الذين يعانون من الربو الخاضع لانضباط جزئى تليها 31 ± 3,605 في المرضى الذين يعانون من الربو المنضبط من مرضى

الربو مع التدخل المنزلي في حين كانت مجموعة السيطرة في المرضى الذين يعانون من الربو غير المنضبط 21,66 ± 3,055 تليها 13,33 ± 3,51 في المرضى الذين يعانون من الربو المنضبط تليها 15 ± 3 في المرضى الذين يعانون من الربو الخاضع لانضباط جزئى.

- أيضا خلال آخر 2 زيارات من فترة المتابعة, كانت نسبة انضباط مستوى الربو أكثر انتشارا بين مرضى الربو مع التدخل المنزلي مقارنة مع أولئك الذين يتابعون العيادة فقط ($p = 0.001$ للزيارات السابعة والثامنة) مع 5 ± 1,414 في المرضى الذين يعانون من الربو غير المنضبط تليها 12,5 ± 2,121 في المرضى الذين يعانون من الربو الخاضع لانضباط جزئى تليها 32,5 ± 3,535 في المرضى الذين يعانون من الربو المنضبط من مرضى الربو مع التدخل المنزلى في حين كانت مجموعة السيطرة، في المرضى الذين يعانون من الربو غير المنضبط 18 ± 1.41 تليها 13,33 ± 3,51 في المرضى الذين يعانون من الربو المنضبط تليها 15 ± 3 في المرضى الذين يعانون من الربو الخاضع لانضباط جزئى.

الاستنتاجات: كان التحكم فى مستوى الربو أكثر انتشارا بين مرضى الربو من خلال زيارات عائلية وهذا يدعم أن تحسين صحة الطفل مع الربو يتطلب إستراتيجية متعددة الأوجه والتي تتعامل مع البيئة المنزلية المادية، استخدام الرعاية الصحية، والالتزام الدواء، والعوامل الخارجية الأخرى (على سبيل المثال، السلوكيات الصحية ومشاركة مقدمي الرعاية).

التوصيات:- أوصت نتائجنا بما يلي:

1 - كانت الاتصالات بين الطبيب والمرضى من خلال زيارات عائلية منتظمة أو زيارات العيادة فعالة في الحد من الأعراض، ومستوى السيطرة وشدة الربو.

2 - دراسة التحكم في الربو لدى الأطفال من خلال الزيارات المنزلية كانت أكثر نجاحا في تحسين عدد من نتائج الربو لمجموعة صغيرة من الأطفال المصابين بالربو ≥ 17 سنة (في كل من المصطلحات العامة والإحصائية).

3 - هناك حاجة لمزيد من الدراسات على نطاق واسع لتقييم تأثير التواصل بين الطبيب والمريض من خلال زيارات عائلية منتظمة على مستوى السيطرة على الربو.