

# Risk Factors of Bronchial Asthma in Almadinah Almunawarh

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**Abstract:** Bronchial Asthma is a life threatening disease and it becomes sever when the humans exposure to factors that induce or exacerbate their illness.

**Objective:** To identify risk factors of adult bronchial asthma in Almadinah Almunawarh.

**Method:** A case-control study was conducted using a specially designed questionnaires to collects data by interviewing 30 cases and 34 control in Almadinah during the period of January 17, 2014 to January 24 m 2014.

**Result:** The majority of cases were older than 25 years, being significantly older than controls ( p-value=0.018 ). Significantly more females in cases than controls ( p-value=0.047 ). Adenoids was also more in cases than controls ( p= 0.045 ). Rhinitis affected cases more than control ( p = 0.00034 ).

Eczema affected cases more than controls ( p = 0.00042 ). The pollution was significantly associated with asthma ( p = 0.00059 ).

**Conclusion:** According to this study, the risk factors of bronchial asthma are age, sex, occupation, smoking, adenoids, rhinitis, dust in environment, and animal around patients, Eczema, sport practice, pollution and allergic food.

**Keywords:** Adult Bronchial Asthma, Eczema, sport practice, pollution and allergic food.

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## 1. INTRODUCTION

Bronchial asthma is a chronic inflammatory disease of the airway which may induce by genetic predispose individual and develops under exposure to factors that create the inflammatory process on the airway. Moreover, the allergens associated with bronchial hyper responsiveness and reversible obstruction and manifests with attacks of dyspnea, breathlessness, cough, wheezing and chest tightness more expressed at breath out. <sup>1</sup>

The bronchial asthma disease considered as one of the most epidemic major respiratory disease that clearly intimidate patient life at variant age group. The chronic disease feature make the patient worry to his life especially at bad prognosis of disease. At sever event, It is affected many system in their body such as kidney, homeostasis and mental state. The respiratory management is the priority aide provide at emergency department that make bronchial asthma patient on seriously position to handle with them more than other emergency patients who attend without respiratory complains.

Determining factors that participate the exacerbate bronchial asthma allows bank up and detection of the most risk on asthma.

Knowledge of the risk factor of bronchial asthma encourage improving the quality of life of the patient.

There are relevance between various allergen and the severity asthma attack that lead the patient to seek for clinic as soon as possible. More over, identify specific risk factor give the mode of prevent deterioration of the disease.

### **Objective:**

To identify risk factors of adult bronchial asthma in Almadinah Almunawarh.

## 2. REVIEW OF LITERATURE

A study on daily exposure to tree, grass and weed pollens plus mold spores were collected for 4 years period at grant hospital in Chicago. It was reported that approximately 57% of the 124 asthma-related death among Chicago resident were recorded during the pollen season. <sup>2</sup>

Another study on air pollution from road traffic especially diesel using advertising and volunteer data bases, founded from 60 adult asthma without smoker, 31 had mild asthma and 29 moderate asthma. Twelve participants had intermittent wheezing and airway hyperresponsiveness to methacholine. <sup>3</sup>

On risk factors and costs associated with asthma attack, by use retrospective cohort analysis data set of 12203 patients with asthma in the UK over a one period was performed. A total of 9016 ( 74 %) patients were in some form of prophylactic asthma medication ; 2653 (22%) experience attack in the year data collection. Night time symptoms were significant in all age groups, exercise induced symptoms were only significant for the young age groups, and poor inhaler technique in the 16-44 age group. <sup>4</sup>

The study of incidence and risk factors for exacerbations of asthma during pregnancy by use PubMed database for narrative literature review. during pregnancy, up to 6 % of women with asthma are hospitalized for an acute exacerbation. sever of difficult to control asthma appears to be the major risk factor for exacerbation during pregnancy. other risk factor include obesity, ethnicity and reflux, whereas atopy dose not appear to be a risk factor. <sup>5</sup>

### Methods:

Using case-control study, the risk factors of bronchial asthma were studied at king Fahad Hospital, Chest Disease Hospital and Badr Hospital in Almadinah Almunawarh. A special questioners was developed to obtain information from case and control. They were interviewed in clinic after the physician finished the treatment and who is waiting to see the doctors.

The interview were conduction in the period from January 17, 2014 to January24,2014. the study included 30cases and 34 controls. The data were schedule and analyzed using the chi square to all of significant. A p-value 0.05 were consider significant.

## 3. RESULTS

Thirty cases and 34 control were included to study and analyze multiple risk factors of bronchial as e finding is various among cases and controls. Regarding age distribution of cases and control, it was found that 83% of cases and 56% of control were 25 years or older. This differences in age was statistically significant (  $p=0.018$ ; table 1 ),but there is evidence that child born with bronchial asthma make the child morbidity more than adult in another study. The females was found 40 % of cases and 17 % of controls, significant result (  $p\text{-value}=0.047$ ; table 2 ).

The workers was 53% of cases and 29% of controls, borderline significant (  $p=0.0518$ ; table 3 ) the smoking was not significant (  $p=0.7$ ; table 4 ). The cases who suffer from adenoids was 23% of cases and 5% of controls, significant result (  $p= 0.045$ ; table 5 ). The rhinitis affect 53 % of cases and 11% of controls of bronchial asthma patient (  $p= 0.00034$ ; table 6 ) On other hand, the environmental dust was equal for both groups and the presence of animal around them weren't significant ( table 7 ).

Furthermore, allergic on skin ( eczema ) is affect 43 % of cases and 5 % of controls especially for heredity bronchial asthma (  $p=0.00042$ ; table 9 ).

The sport practice was high risk to exacerbate bronchial asthma on cases ( table 10 ).

The pollution has stress on large number 73% of cases compare to 29% of controls (  $p=0.0059$  ; table 11)

Allergic food has very little percentage to be as risk factors. not significant (  $p=0.14$ ; table 12 )

**Table (1) Age distribution of cases and controls of bronchial asthma and their control (Almadinah Almwnawrah )**

	cases	controls	Total	P-value
< 25	5	15	20	0.018
>= 25	25	19	44	

**Table (2) gander distribution of cases and control of bronchial asthma ( Almadinah Almunawarah)**

Gender	Cases	controls	Total	p-value
Male	18	28	46	0.047
Female	12	6	18	

**Table (3) occupation distribution among cases and control of bronchial asthma ( Almadinah Almunawarah )**

Occupation	cases	controls	Total	P-value
Worker	16	10	26	0.0518
Not working	14	24	38	

**Table (3) show smoking habit for cases of bronchial asthma and their control (Almadinah Almunawarah )**

Smoking	cases	controls	total	cases	controls	P-value
Current	6	5	11	15	15	0.7183
occasional	2	3	5			
Passive smoker	7	7	14			
N0n smoking	15	18	33	15	18	

**Table (4) show positive and negative adenoids disease for cases of bronchial asthma and their control (Almadinah Almunawarah)**

adenoids	cases	controls	Total	P-value
Yes	7	2	9	0.045
No	23	32	46	

Table (5) show positive and negative rhinitis for cases of bronchial asthma and their control ( Almadinah Almunawarah )

Rhinitis	cases	controls	Total	P-value
Yes	16	4	20	0.00034
No	14	30	44	

Table (6) show dust around environmental for cases of bronchial asthma and their controls( Almadinah Almunawarah )

Dust in environment		cases	controls	Total	P-value
floor	Yes	12	12	24	N.S.
	No	18	22	40	
carpet	Yes	10	14	24	
	No	20	18	38	
furniture	Yes	10	12	22	
	No	20	22	42	
curtain	plastic	2	5	7	
		17	15	32	
	Not available	7	14	21	

Table (6) Animal around cases of bronchial asthma and their control ( Almadinah Almunawarah )

Animal	cases	Controls	Total	cases	controls	P-value
cats	3	2	5	14	10	0.2717
Sheep	7	5	12			
Dogs	3	0	3			
Other	1	3	4			
Not available	20	25	45	20	25	

Table (7)positive and negative of Eczema For cases of bronchial asthma and their control( Almadinah Almunawarah )

Allergy on skin ( eczema )	cases	controls	Total	P-value
Yes	13	2	15	0.00042
No	17	32	49	

**Table (8) sport practice activity distribution for cases of bronchial asthma and their controls (Almadinah Almunawarah )**

Sport practice		Cases	Controls	Total	P-value
Football	Yes	8	9	17	N.S.
	No	22	25	47	
Basketball	Yes	2	2	4	
	No	28	32	60	
Body building	Yes	1	5	6	
	No	27	29	56	
other		11	0	11	

**Table (9) pollution distribution for cases of bronchial asthma and their control (Almadinah Almunawarah )**

Pollution	Cases	Controls	Total	cases	controls	P-value
Car's exhaust	8	5	13	22	10	0.0059
Incense	8	1	9			
Dust	2	2	4			
Other	4	2	6			
No pollution	14	25	39			

**Table (10) food allergy for cases of bronchial asthma and their control ( Almadinah Almunawarah )**

Allergic food	Cases	Controls	Total	Cases	Controls	P-value
Eggs	3	1	4	7	3	0.1394
Grain	0	0	0			
Mango	1	0	1			
Bananas	1	0	1			
Other	2	2	4			
No differences	25	31	56	25	31	

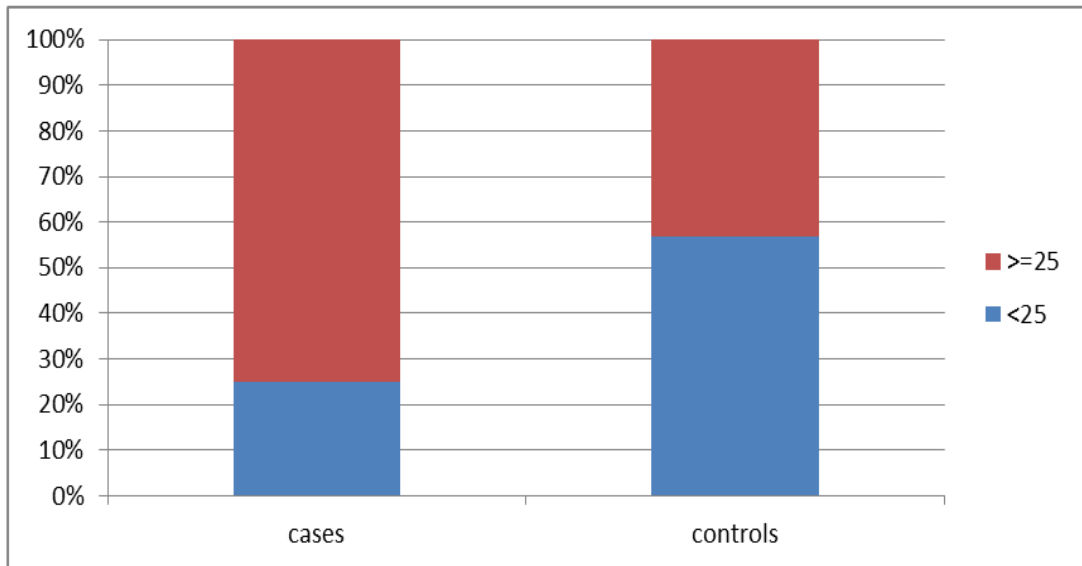


Figure 1: Show distributed age group for cases of bronchial asthma and their control

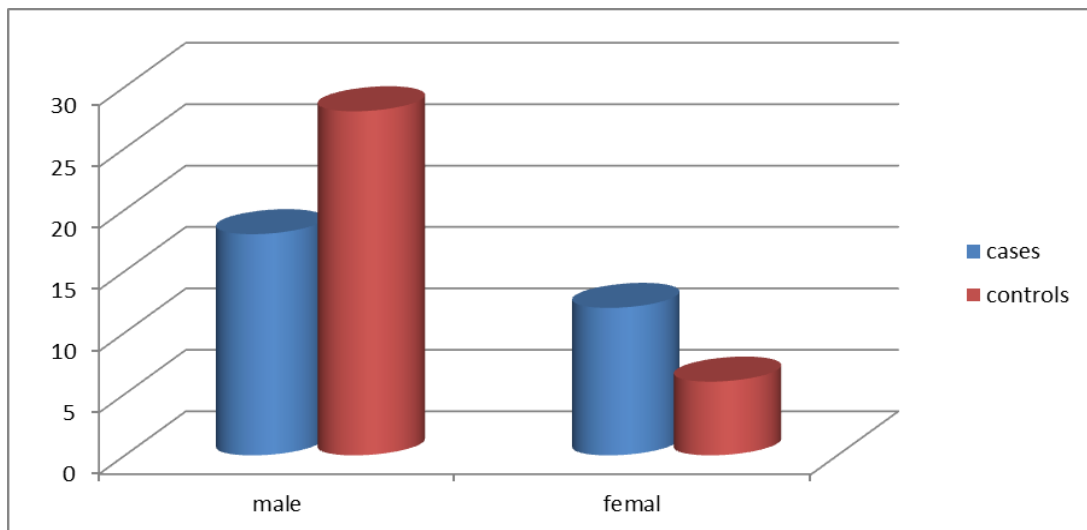


Figure 2: Show gender distributed for cases of bronchial asthma and their control

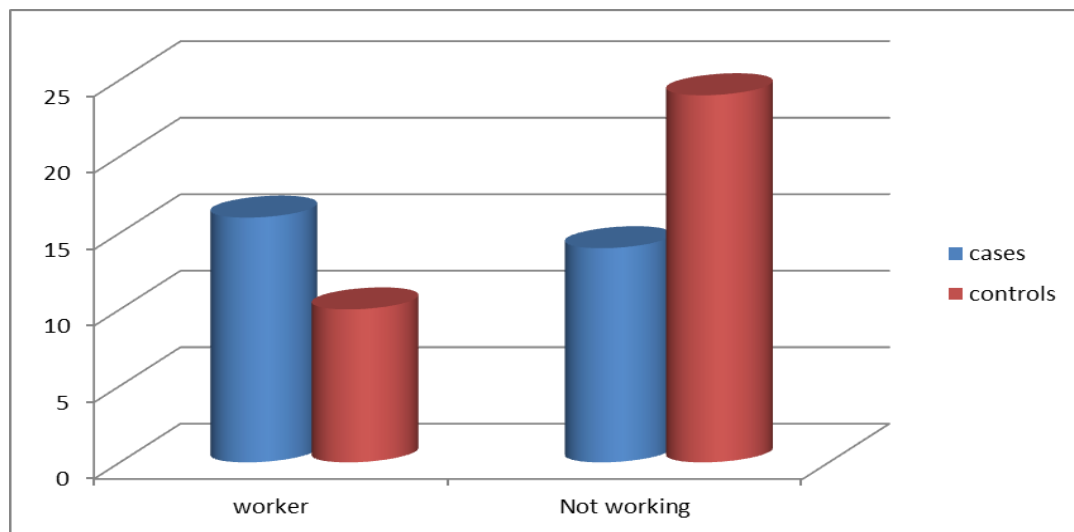


Figure 3: Show percentage worker and not working cases of bronchial asthma and their control.

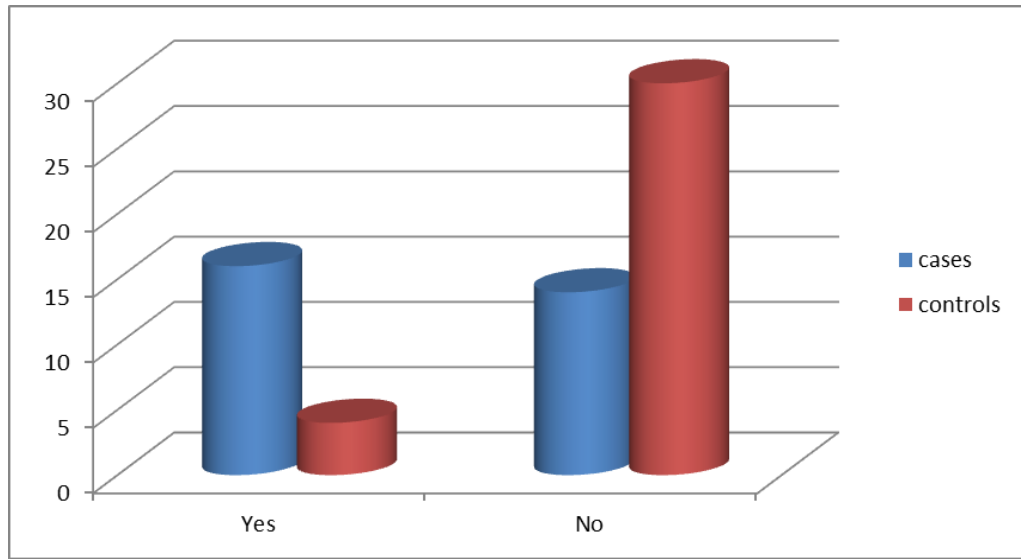


Figure 4: Rhinitis for cases and controls bronchial asthma.

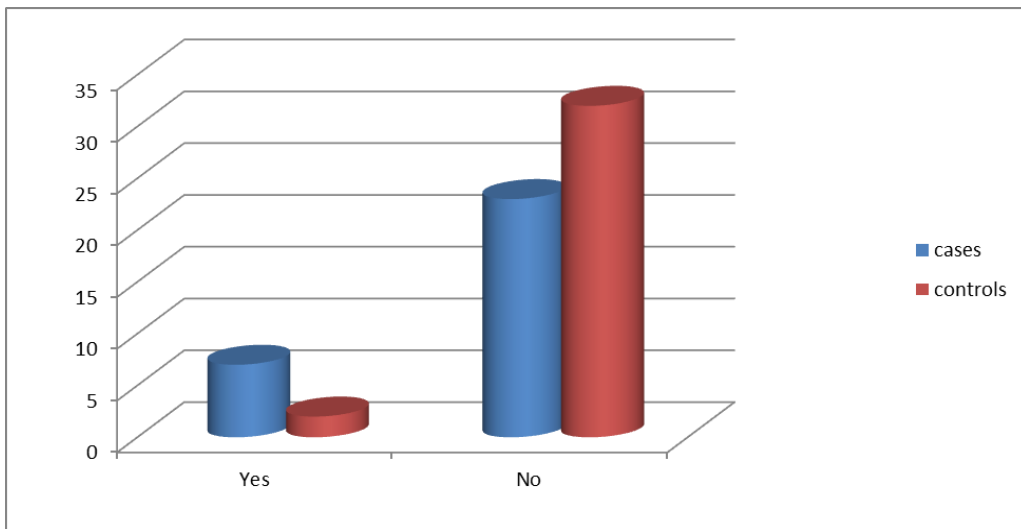


Figure 5: Show Adenoids affect cases of bronchial asthma and their controls.

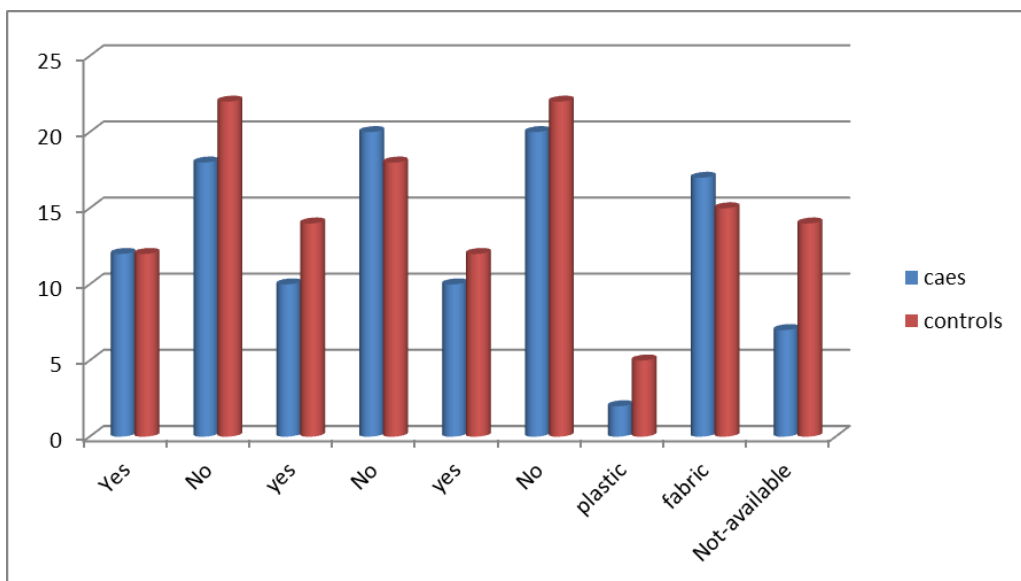


Figure 6: How distribution of dust in environment around cases of bronchial asthma and their controls.

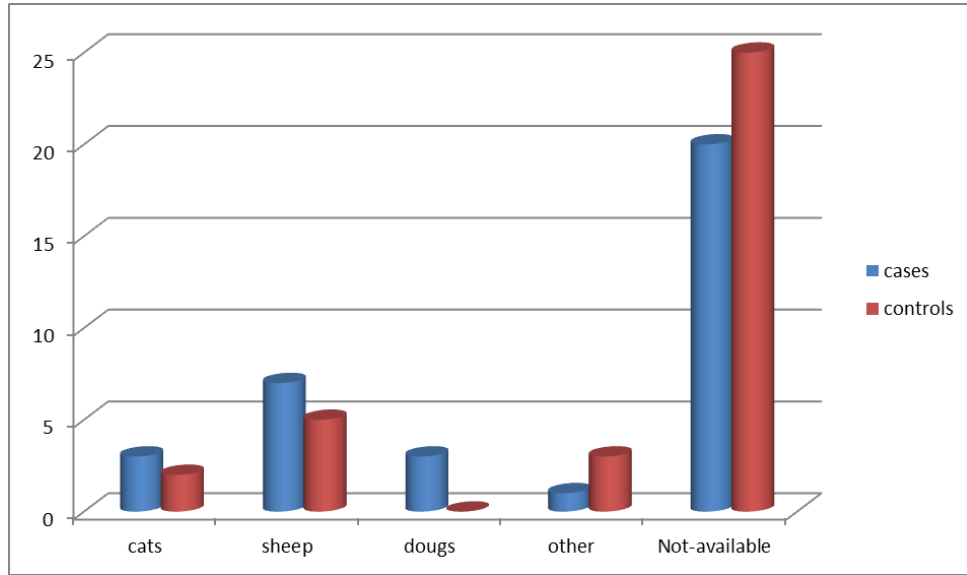


Figure 7: Animal found around cases of bronchial asthma and their controls.

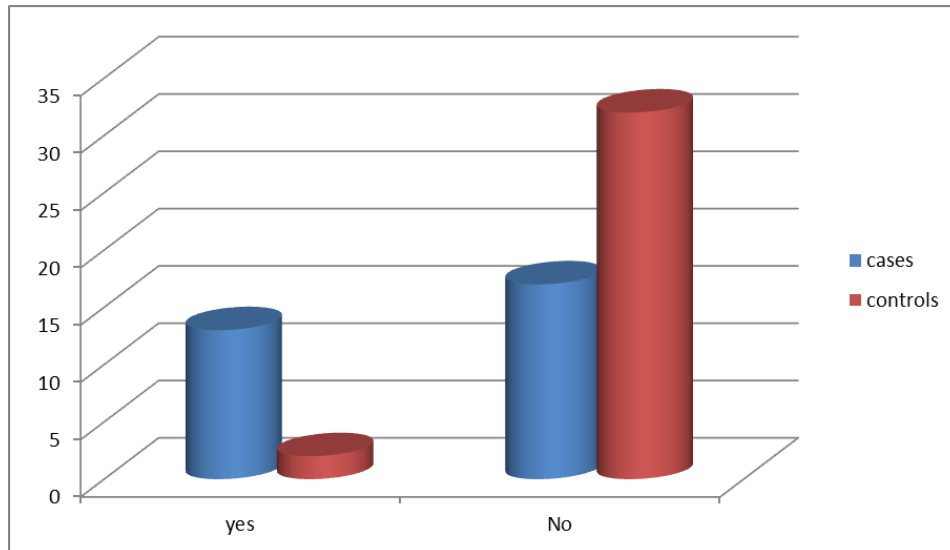


Figure 8: Show eczema found in cases of bronchial asthma and their controls.

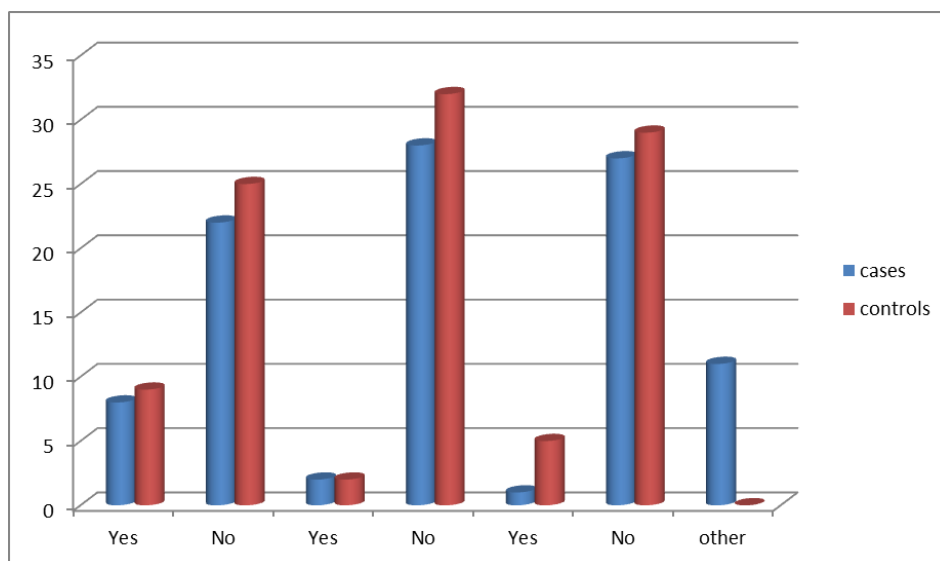


Figure 9: Variation sports practice among cases of bronchial asthma and their controls.



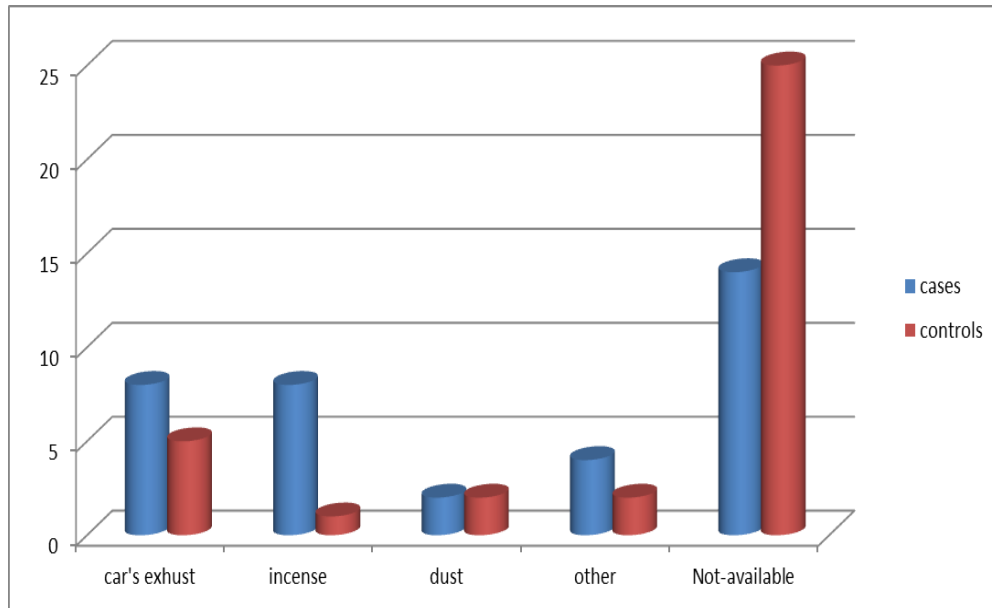


Figure 10: Pollution affects cases of bronchial asthma and their controls.

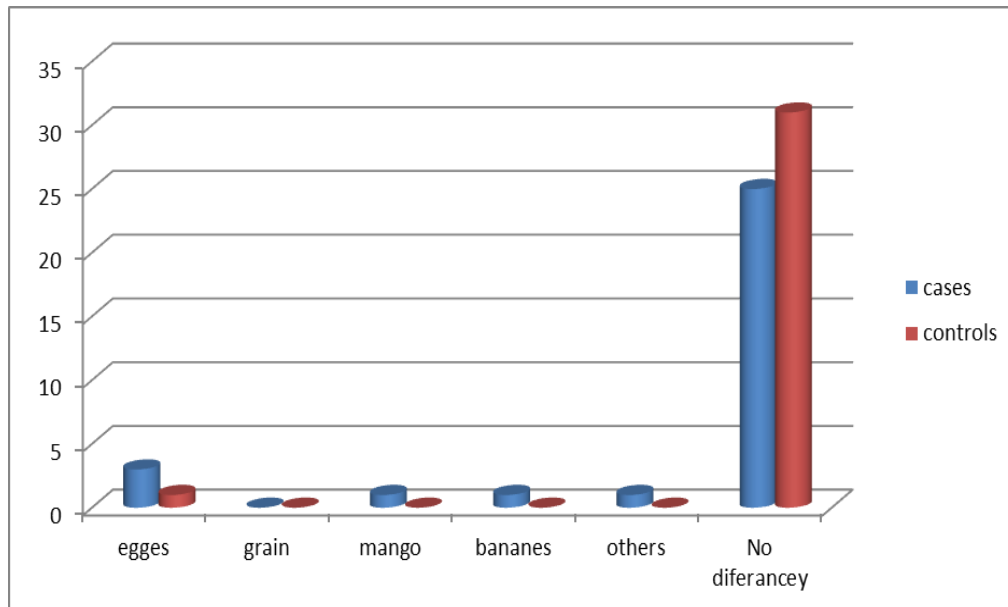


Figure 11: Show food allergy distribution for cases of bronchial asthma and their controls.

#### 4. DISCUSSION

The age group >25 years and male is more affected than younger female and male people. there are more male in this study than male in both cases and control. This can be because the data collaret was a male and this can cause tendency to seek the male participant. Also the workers specially in industrial field was involve bronchial asthma aggressively than non workers as student or implement individuals.

In the risk factor case-control study the adenoids and rhinitis were significant to affect bronchial asthma cases compare to previous research on urban resident. <sup>6</sup>

As well as study on person exposure to diesel traffic the occupations weren't significant in the change lung function obviously on cases and control people. <sup>7</sup>

Obviously, eczema was significant skin allergy in inherited bronchial asthma as mentioned in old study and this research. The smoking habit wasn't high mark to be major risk factor opposite than many studies that make it the worst habit on bronchial asthma patient and general population. <sup>8</sup>

The dust hasn't show great risk although total static for questioner mark 107 but for control was 115 that main people affected try to avoid source of dust. Also, animal doesn't appear risk on cases as such as control in the sample. On other hand, similar to risk factor study on vaccine and allergy there aren't high risk factor to use medication for cases.<sup>9</sup>

On level of sports practice the risk of episode asthma wasn't much significant compare to previous study on sample at Chicago city oxford street.<sup>10</sup>

In association with drop in lung function of patient in oxford street and on pollution as risk factors of cases were high risk to affect bronchial asthma patients. pollution is extremity dangerous factor than previous studies o the direct effects diesel exhaust on asthma cases.<sup>11</sup>

Lastly, food allergy have neglected result in study sample with little exception for eggs.

The finding of these studies have not been entirely consistent and demonstrated decrees lung function.

Data from this study suggest that increase episode of asthma during winter season compare other study of effect environmental mold that overbalance the spring through fall season.

#### 4. EXPLANATION

The major variable characteristics of asthma include a unsteady degree of airflow obstruction (related to bronchospasm narrowing, edema, and hyper-secretion), ( bronchial Mucus hyper- responsiveness ) and airway inflammation.

Inspire allergens give rise to Early phase bronchial allergic reaction that characterized by stimulation active of cells bearing specific allergen immunoglobulin E antibodies.

There is rapid response activation of specific airway mast cells and macrophage cells, which emission pro inflammatory mediators for example histamine and eicosanoids that induce narrowing and contraction of large,medium and small airway smooth muscle., vasodilation, mucus secretion, and exudation fluid of plasma in the airways. Perfusion of Plasma protein leakage induces a gradual thickened, edematous various airway wall and a narrowing of the airway hollow with decrease mucus clearance.

The late phase is the inflammatory reaction that occurs 7 to 9 hours after allergen excitation and influence recruitment and activation of eosinophil cells, T lymphocytes, basophils cells, neutrophils cells, and macrophages cells.

Eosinophil cells emigrate to the airways and start release inflammatory mediators such as leukotrienes, cytotoxic mediators and cytokines.

T-lymphocyte cells activation process leads to release some of cytokines from type 2 T helper cells that began mediate allergic inflammation ( interleukin ).

Contrariwise, type 1 T helper cells start produce IL 2 and interferon- $\gamma$  which are essential for cellular defense response mechanisms.

Allergic adult asthmatic inflammation may out come from an loss of balance between TH1 and TH2 cells.

Mast cell degranulation in response to allergens workout results in projection release of mediators like eosinophil, histamine, and neutrophil cells chemotactic factors, leukotrienes, prostaglandins and platelet activating factor.

Histamine is potent of inducing respiratory smooth muscle constriction and bronchial spasm and may have a role in airway mucosal edema and thick mucus secretion.

Alveolar macrophages cells release huge number of active inflammatory mediators, including platelet activating factor and leukotrienes.

Production of neutrophil cells chemotactic factors increase the inflammatory process.

Neutrophils cells are also have a source of mediators that participate to airway inflammation.

The 5 lipoxygenase pathway a source of arachidonic acid metabolism is a major contribute for production process of cysteinyl leukotrienes.

Leukotrienes are responsible for released during inflammatory processes in the airway and stimulate micro-vascular permeability, bronchial spasm, secretion mucosa, and bronchial edema.

Bronchial epithelial surface cells contribute in inflammation process by releasing cytokines, matrix proteins, eicosanoids, peptidases, and nitric oxide.

The exudative inflammatory and sloughing process of epithelial cells inside the bronchial airway lumen impair distraction muco-ciliary transport.

Epithelial shedding process results in increase airway responsiveness, altered bronchial permeability of the respiratory airway mucosa.

The bronchial lumen glands are Hypertrophy ( increased in size ) and the air way goblet cells are hypertrophy and increased in number. Expecterated bronchial mucus from patients airway with asthma is mostly high viscosity.

The airway is inhibitory innervated by sympathetic, parasympathetic, and non adrenergic nerves. The normal resting tone of bronchial smooth muscle is maintained by vagal nerve efferent activity, and bronchial constriction can be energizing by vagal activation in the small airway. Bronchial smooth muscles haven non innervated beta 2 adrenergic receptors that induce bronchodilaton .

The non-cholinergic nervous, non-adrenergic system in the trachea and bronchi may magnify inflammatory process in asthma by emission nitric oxide.<sup>12</sup>

## **5. CONCLUSION**

Bronchial asthma is a common respiratory chronic disease that affect a large number of population. It is increased in frequency and mortality for some reason that research in going on to find them. So, this study run on to explore the most risk factors of bronchial asthma based on case-control study. Unfortunately, adenoids, rhinitis. eczema, pollution and winter season have high risk on the health of chest disease.

## **6. RECOMMENDATION**

Any individual who has exposure to extremely risk factor and has recurrence respiratory disease such as shortness o breathing, wheezing, chronic chough or bronchitis ; he should seek for respiratory heath cares to resave prober treatment as soon as possible and protect his air way prognosis to bronchial asthma. There are many tests that can evaluate respiratory air way events and rule out bronchial asthma in early stage.

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