

## Relationship between Asthma and Obesity in Pediatric Age from Four Years to Four Teen Years in Tabuk City

Nada Awad Al Suhaimi<sup>1\*</sup>, Amani Abdullah Albalawi<sup>1</sup>, Nada Saleh Al-Balawi<sup>1</sup>,  
Amani Salem Al-Atawi<sup>1</sup>, Hamad Ibrahim Albalawi<sup>2</sup>, Asmaa Ghmaird<sup>3</sup>

<sup>1</sup>Medical intern, Tabuk University, Faculty of Medicine, Tabuk City, Saudi Arabia.

<sup>2</sup>Medical Students, Tabuk University, Faculty of Medicine, Tabuk City, Saudi Arabia.

<sup>3</sup>MD, Assistant Professor of Pediatric, Pediatric Consultant, Tabuk, Saudi Arabia.

### ABSTRACT

**Introduction:** Asthma is the most common heterogeneous chronic disorder of the airways, characterized by variable usually reversible and recurring symptoms of cough, wheezing, shortness of breath, and chest tightness related to one or more of airflow obstruction.

**Methods:** A cross sectional study conducted in Tabuk city to determine statistic of asthma, to identify the risk factors for asthma and to determine the relationship between BMI and asthma.

**Results:** A total of 171 participants included in this study, most of them aged between 4-7 years old (48.5%), 66.7% were male and 97.1% were Saudi. Most of asthmatic child weight 5-85 percentile. 33.9% of study participants exposed to passive smoking, regarding family history 24% had positive history of asthma in parent, 28.7 had family history of atopy in form of allergic rhinitis and eczema.

**Conclusion:** Steps such as education and explanation about

asthma and its risk factors, passive smoking effect on asthma are required to improve public awareness.

**Keywords:** Asthma; Tabuk; Saudi Arabia.

### \*Correspondence to:

**Nada Awad Al Suhaimi,**  
Medical intern,  
Tabuk University,  
Faculty of Medicine,  
Tabuk City, Saudi Arabia.

### Article History:

**Received:** 10-08-2018, **Revised:** 06-09-2018, **Accepted:** 30-09-2018

Access this article online	
Website: <a href="http://www.ijmrp.com">www.ijmrp.com</a>	Quick Response code 
DOI: 10.21276/ijmrp.2018.4.5.048	

### INTRODUCTION

Asthma is the most common heterogeneous chronic disorder of the airways, characterized by variable usually reversible and recurring symptoms of cough, wheezing, shortness of breath, and chest tightness related to one or more of airflow obstruction.<sup>1</sup>

The prevalence of asthma indicated by WHO, world widely 235 million individuals complaining of asthma<sup>2</sup>, and in US increase in the last three decades in which affect 10% of school age children<sup>3</sup>, and more than two million Saudis complaining of asthma.<sup>4</sup> It affects patients, their families, and therefore the community<sup>1</sup>, and evaluated to cost \$3.2 billion every year, represents 14 million missed school days every year and is the third reason for hospitalization among children younger than 15 years old.<sup>5</sup> A Systemic review study done at 2017 for Prevalence of asthma among Middle Eastern children revealed prevalence of asthma less the developed countries but this study should include all countries of the region to estimate more accurate information.<sup>5</sup>

There are many factors to explain increasing asthma rates, including genetic, environmental, and socioeconomic factors<sup>6</sup>, and the obesity one of them. The obesity which increases asthma severity is a preventable condition which affects the physiological and psychological health and defined by WHO as (abnormal or

excessive fat accumulation that may impair health.) Its the one of a risk factor for diabetes, cardiovascular disease, hypertension, a certain type of cancers, musculoskeletal disorders, and now there is some evidence establish the association between asthma and obesity.<sup>6</sup> Also, obesity is affect 18% of school aged children in US.<sup>7</sup>

The obesity increase the prevalence of asthma .a meta-analysis of the effect of high weight on asthma during childhood period estimated the children with high body weight at risk to have asthma in future with rate 1.5 times than children without overweight.<sup>8</sup> The obesity increase airway hyper responsiveness by some inflammatory substances that increase in circulation like (leukocytes, serum concentrations of cytokines, cytokine receptors, chemokines, and acute phase proteins ) and adipocyte-derived factors.<sup>9</sup> the obesity has negative impact on asthma control and therapy response too.<sup>10</sup>

The obesity which start early will limit the chest wall expansion, make the diaphragm mobility more difficult, increase the breath rate with shallow pattern and will reduce the lung compliance and function all these will lead to dyspnea with more lung effect which result in asthma and other diseases.<sup>11</sup>

Another study found that obesity will lead to increase the airway inflammation and reduce the steroid therapy response by increasing systemic oxidative stress which lead to poor asthma control even the patient have a good pulmonary function.<sup>11</sup> So targeting overweight children is important to reduce the asthma incidence.

There are several studies revealed that there is relation between asthma and obesity resulted with positive association.<sup>12-15</sup>

Papoutsakis C<sup>15</sup> et al found that majority of children who have asthma are central obese. Also there is study which found the asthma increase particular in post-pubertal females than males<sup>16</sup> vs. the study which done on adult which found the same rate between male and female for incidence of asthma.<sup>17</sup>

A large case control study which conducted in Madinah, Saudia Arabia 2013 found that there is association between asthma and children central and peripheral obesity.<sup>12</sup>

Luder E et al<sup>13</sup> who study black and Hispanic children with single diagnosis of asthma in them study result in children with moderate to severe asthma are more obese than their peer, also, they found that the overweight is associated with more asthma severity.

The prospective, longitudinal study which conducted in western Sweden at 2015 resulted in high bodyweight at childhood increase the risk of asthma diagnosis at school age which suggest that the risk of this relation is mediated by the immune system.<sup>18</sup>

Gilliland FD<sup>14</sup> et al before they did a longitudinal study at 2003 found nearly result same other studies they found that begin overweight increase the risk of newly diagnose asthma in boy and non-allergic children.

However there are few studies conducted in Saudi Arabia and no studies conducted in Tabuk. We aim in this study to investigate obesity as a risk factor for asthma.

**METHODOLOGY**

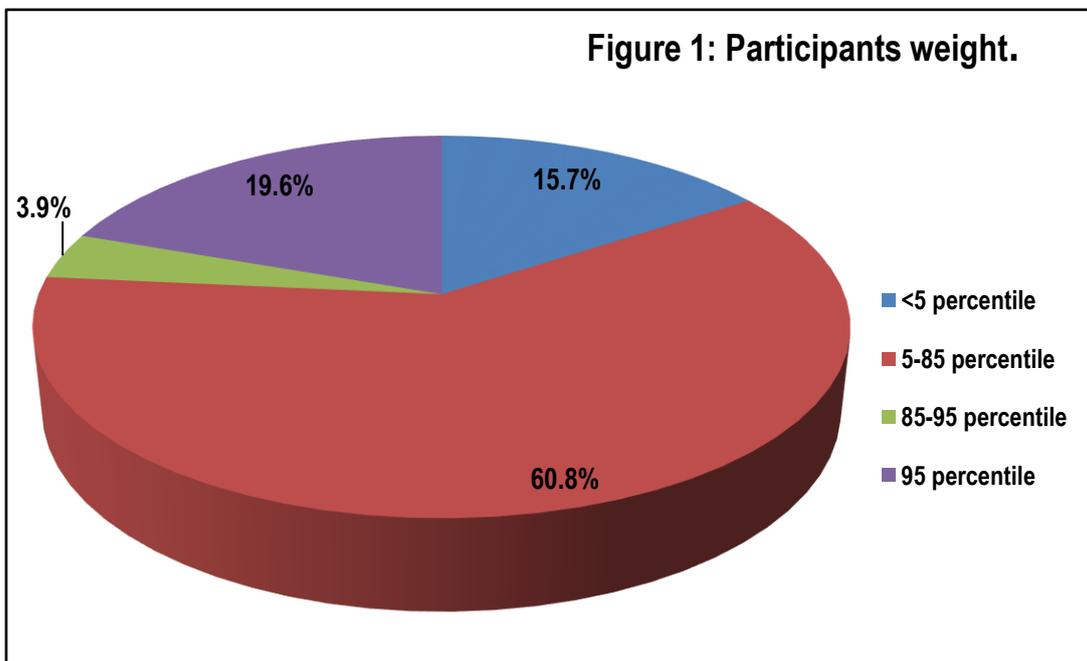
A cross sectional study conducted in Tabuk city to determine statistic of asthma, to identify the risk factors for asthma and to determine the relationship between BMI and asthma. Study include children diagnosed with asthma aged between 4 – 14 years old via questionnaire contain data about socio-demographics information like gender, age, passive smoke exposure, type of child feeding , Birth weight, family income, asthma of parent, family history of parent, family history of atopic diseases, child history of atopic diseases . Items regarding the knowledge, attitude and practice of our health problem.

**Ethical Considerations:** Study was explained to participant and informed consent was taken from the participant.

**Statistical Analysis:** The collected data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) statistical program version 19.

**Table 1: General characteristics of study participants. (N=171)**

		Number	Percentage
<b>Age</b>	<b>4-7 Years</b>	83	48.5%
	<b>8-11 Years</b>	57	33.3%
	<b>12-14 Years</b>	31	18.1%
<b>Gender</b>	<b>Male</b>	114	66.7%
	<b>Female</b>	57	33.3%
<b>Nationality</b>	<b>Saudi</b>	166	97.1%
	<b>Non Saudi</b>	5	2.9%



**Table 2: Participants risk factor and family history of asthma.**

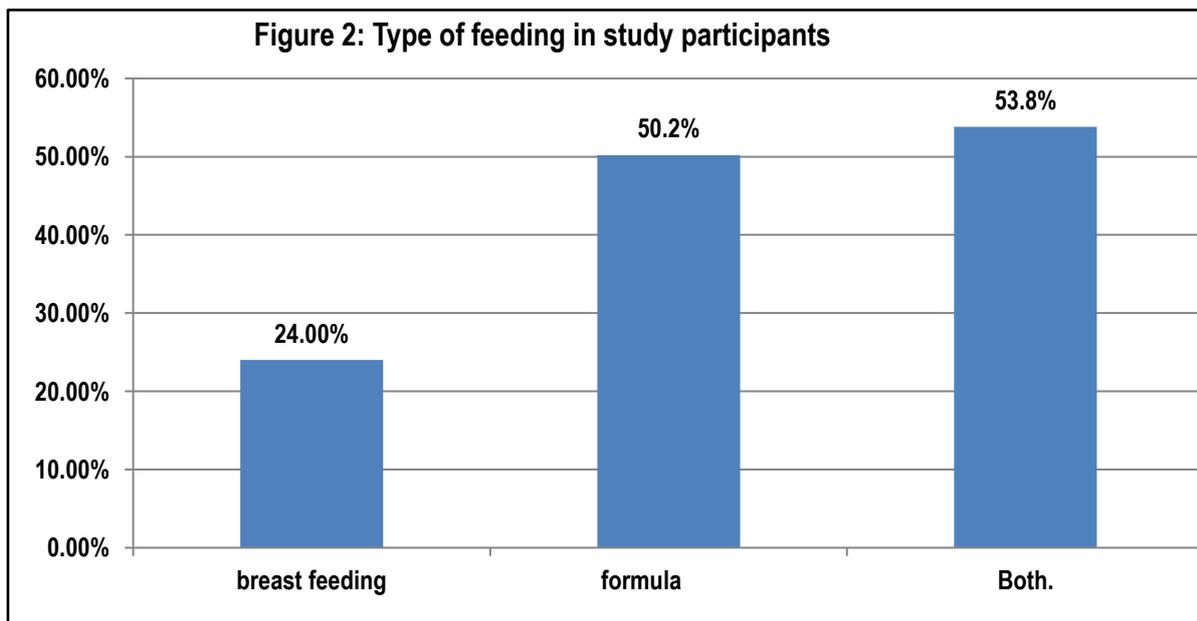
	Yes		No	
	n	%	n	%
Passive smoke exposure?	58	33.9%	113	66.1%
Passive Hubble bubble exposure?	17	9.9%	154	90.1%
History of asthma in parent?	40	24%	130	76%
Family history of asthma (sibling)?	58	33.9%	113	66.1%
Family history of atopic disease such as (allergic rhinitis, eczema)?	49	28.7%	122	71.3%
Is your child having atopic disease such as (allergic rhinitis, eczema)?	68	40.6%	101	59.4%
Was there an animal or plant at home?	42	24.6%	129	75.4%

**Table 3: Participant symptoms of asthma.**

	Yes	
	n	%
Primary health care should be the first place to visit for any health problem.	123	27.1%
If you have any health problem you will visit Primary health care first?	156	36.3%
Did you visit primary health care only to ask for referral?	178	39.2%

**Table 4: Participants practice and believe toward primary health care.**

	Yes		No	
	n	%	n	%
Does your child have wheezing?	111	64.9%	60	35.1%
The Common symptom of your child at night?	114	66.7%	57	33.3%
Did the child complain from other symptoms?	17	9.9%	154	90.1%



**RESULTS**

A total of 171 participants included in this study, most of them aged between 4-7 years old (48.5%), 66.7% were male and 97.1% were Saudi. (Table 1) As shown in figure 1, most of asthmatic child weight 5-85 percentile (60.8%), 19.6% weight more than 95 percentile, 15.7 weight less than 5 percentile. 33.9% of study participants exposed to passive smoking, regarding family history 24% had positive history of asthma in parent, 28.7 had family history of atopy in form of allergic rhinitis and eczema. (Table 2) In regard asthma symptoms, 64.9% has wheezy chest, 66.7% report that symptoms increase at night. (Table 3)

**DISCUSSION**

Asthma the most common chronic disorder of the respiratory system characterized by variable usually reversible and recurring symptoms of cough, wheezing, shortness of breath.<sup>1</sup> Asthma related to many risk factors including; genetic, environmental, socioeconomic and most serious is obesity.<sup>6</sup> Obesity increase the risk of asthma as a A large case control study which conducted in Medina Saudi Arabia 2013 found that there is association between asthma and children central and peripheral obesity.<sup>12</sup> Same as increase the severity of asthma and it increase the respiratory symptoms.<sup>11,13</sup>

