



OBESITY; OBESITY ADDING DISEASE BURDEN IN ASTHMATIC FEMALES (DESCRIPTIVE CROSS-SECTIONAL SURVEY).

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ABSTRACT... Introduction: Obesity is an important factor for increasing breathing problems among asthmatic female population. However there appeared to be no published data on obesity and asthma pertaining to women in Pakistan. The aim of the study was to determine the association of obesity and asthma in women and to find if obesity is a risk factor for adding complications in them. **Study Design:** Descriptive cross sectional survey. **Period:** February 15, 2016 to July 15, 2016. **Setting:** Pakistan Railway Hospital, Rawalpindi. **Methodology:** 100 asthmatic female patients. Sample size was calculated through Rao-soft. The participants were recruited through non probability purposive sampling technique. A semi-structured questionnaire of 21 questions was used to collect data which was analyzed later on SPSS 20. **Results:** Out of 100 female asthmatic patients, 45 patients were found overweight. strong positive association ($r = 0.52$) was found between BMI with duration of asthma. Negative Moderate association ($r = 0.22$) of BMI with life style was found. **Conclusion:** Present Study concluded that obesity adds to the complication of asthma and there lays an association between obesity and asthma. As the duration of asthma increases it causes increase in BMI resulting in severity of symptoms, activity limitations and decline in life style.

Key words: Asthma, Obesity, BMI (Body Mass Index), Borg Scale.

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INTRODUCTION

Obesity and overweight is on fifth number being major and leading risk for deaths globally. WHO states about 2.8 Million annual adult deaths ensues due to obesity and overweight.¹

Obesity is rising rapidly and has become a worldwide epidemic with more than 35% of adults considered to be obese or overweight.² In past decades obesity and overweight has greatly increased and is now becoming a public health problem in developing as well as developed countries.³ exact prevalence of obesity among females in Pakistan is not known but a recent study conducted in Peshawar concludes obesity among women as a serious health concern in region and level of obesity in Pakistan is increasing over time at varying rates.⁴

A major risk factor impairing quality of life is obesity and is also a risk factor for a number of conditions that affect quality of life. The exertion associated

with normal respiration or breathing is increased in individuals being obese or overweight due to alterations in respiratory structure and function. Asthma is one of the common clinical problem that is highly impacting individual's health and with the passage of time it is becoming more markedly prevalent. The prevalence of asthma has increased worldwide since 1960s.⁵

Worldwide approximately 300 million individuals have asthma and this is expected to be blown out to 400 million individuals by 2025.⁶ In Pakistan around 15 million children and 7.5 million adults agonize asthma due to the increasing urban population, environmental factors, air pollution and enlarging intercity industries, disclosed a detailed research study conducted by doctors associated with the Aga Khan University Hospital (AKUH).⁷

Asthma and obesity have a considerable impact on public health and their prevalence

has increased in the recent years. Asthma and obesity are two common health problems often coexisting in the same patient. Many studies suggest a relationship between asthma and factors such as changes in obesity and increased prevalence of asthma in obese patients.^{8,9} Some studies suggest that obesity precedes asthma increases both its prevalence and severity and may lessen the efficacy of those drugs normally used in asthma treatment.

The relationship of asthma and obesity has been proposed by a number of hypotheses to explain the link between the two. Most important of all factors is the dietary lifestyle that predisposes to obesity.¹⁰ Second most important factor is the mechanical effect of obesity on the lungs physiology and abdominal wall. Obesity leads to reduced lung volumes, pulmonary compliance and the diameter of peripheral airways thus disturbing the ventilation perfusion relationship and volume of blood in the lung. In obese or overweight patients fall in pulmonary compliance might be due to fat density and penetration of the thorax or the increase in lung blood volumes leading to particular surge in dyspnea.¹¹ Likewise, obesity can decrease both FEV1 and FVC but, this lessening is stereotypically symmetrical, with the FEV1/FVC ratio lasting unchanged. Some writers have even reported a restrictive model in overweight subjects with an amplified FEV1/FVC ratio.¹² All these variations can foster superficial breathing with condensed lung volumes mainly expiratory reserved volumes. These reduced volumes are related with decrease in the diameter of peripheral airway that can lead to changes in the function of bronchial smooth muscle. Hence changing the actinmyosin cross-bridge cycle, this can potentially increase both obstruction and bronchial hyper reactivity (BHR).¹³

Weight loss has been found to improve asthma control and reduce its severity mainly by medication.¹⁴ Weight reductions from diet and exercise have been found to improve asthma symptoms, reduce peak expiratory flow variation and improve spirometric values.

MATERIAL & METHODS

A descriptive cross sectional survey was conducted from February 15, 2016 to July 15, 2016 at the leading government, semi government and private hospitals in Rawalpindi and Islamabad. Out-patient & in-patient of Pakistan Railway General Hospital were approached. A sample of 100 female patients medically diagnosed and labeled by medical specialist as asthmatic, age ranging from 20 to 60 years was selected through non probability purposive sampling technique. Patients with any other respiratory or cardiac complication like chronic obstructive pulmonary disease, restrictive lung disease, carcinomas, cardiomegaly, Ischemic heart disease were excluded from the study. Sample size was calculated through Raosoft Sample size calculator with the margin of error 9.78%. A semi-structured questionnaire of 25 questions was used along with Borg Scale and BMI chart to collect data from the patients. Body Mass Index (BMI) classifications are calculated as weight in kilograms divided by height in metres squared (kg/m^2). The current WHO BMI cut-off points of $<16 \text{ kg}/\text{m}^2$ (severe underweight), $16.0\text{--}16.9 \text{ kg}/\text{m}^2$ (moderate underweight), $17.0\text{--}18.49 \text{ kg}/\text{m}^2$ (mild underweight), $18.5\text{--}24.9 \text{ kg}/\text{m}^2$ (normal range), 25 (overweight), $25\text{--}29.9 \text{ kg}/\text{m}^2$ (preobese), $30 \text{ kg}/\text{m}^2$ (obesity), $30\text{--}39.9 \text{ kg}/\text{m}^2$ (obese class I), $35\text{--}39.9 \text{ kg}/\text{m}^2$ (obese class II), $40 \text{ kg}/\text{m}^2$ (obese class III) should be retained as international classification.¹⁵ First four questions were used to collect demographic data. Eight questions inquired severity, variation in symptoms over the course of disease, frequency of asthmatic attacks and trends in disease progression. Other questions confirmed comorbid conditions, life style, physical activity and variation in weight and eating habits with before and after asthma. Severity of asthma was measured using Borg Scale. Values of borg scale ranges from 0 to 10 where at 0 breathing is causing no difficulty at all and progresses through to number 10 where breathing difficulty is maximal. Height and weight were measured to calculate BMI.

The data was entered and analyzed on Statistical Packages for Social Sciences (SPSS version 20). Pearson Correlation test was applied.

RESULTS

Data used in this study was collected from a sample of 100 female asthmatic patients to study the link between asthma and obesity among female population of Rawalpindi and Islamabad. Mean age of the participants was 47.76 with standard deviation 6.34. According to BMI 14 patients were underweight, 41 were in normal category and 45 patients fall in overweight category.

Results indicate strong positive association of BMI with duration of asthma showing that patients having chronic asthma are more prone to gain weight. Increased weight further puts them at greater risk of aggravated night symptoms and comorbid conditions.

Negative moderate association of body mass index with life style shows that with increase

in BMI life style becomes more sedative and increases activity limitation.

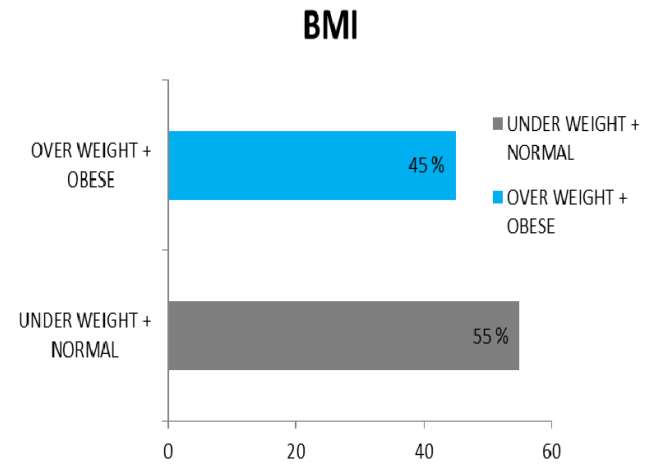


Figure-1. Bar chart of BMI (body mass Index)

Sr.No	Variables	Pearson Correlation R - Value	Significance P- Value	Strength of Correlation
	Duration of Asthma * BMI	0.52	0.60	Strong Association
	BMI * Co-Morbidity	0.12	0.21	Moderate Association
	BMI * Night Symptoms	0.18	0.06	Moderate Association

Table-I. Pearson correlation of BMI with other Variables

Sr.No	Variables	Pearson Correlation R - Value	Significance P- Value	Strength of Correlation
	BMI * Life Style	-0.22	0.28	Moderate Association
	BMI * Activity Limitation	0.23	0.19	Moderate Association
	Activity Limitation * Life Style	-0.29	0.003	Moderate Association

Table-II. Pearson correlation of BMI with activity limitation and life style

However no association was found between severity according to borg scale and BMI.

DISCUSSION

Asthma itself is a worsening condition leading to a lot of health problems. When this co-exists with obesity, it further amplifies the severity of asthma. And as a result vicious cycle continues. Previous studies have confirmed an association between the two conditions.

In this study we found that there lies a strong positive association between BMI and duration of asthma as patients reported gain in weight. A research by Scott T. Weiss and Stephanie Shore shows that obesity and asthma both are common illnesses and at the same time are chief public health complications.¹⁵ Furthermore, asthma

appears to be worsening by obesity. Common environmental and genetic causes may be shared by both diseases. There are numerous factors including developmental, mechanical, signal transduction, hormonal, and immunologic causes for their special effects.¹⁶

Louis-Philippe Boulet Presented Research at the International Symposium on Cardiopulmonary Prevention/Rehabilitation in June 13-15, 2007 stated that both obesity and asthma are recurrently associated.¹⁶ Moreover obesity might be contributing to the development as well as the severity of asthma from side to side by various influences, probably in many patients,

of multifactorial origin. Need of medication could be reduced by greater weight loss and asthma control could be improved. Furthermore, more research is needed to determine what the optimal management of asthma in obese patients is.¹⁷

CONCLUSION

From the research it is concluded that obesity is a risk factor in asthmatic female as some women gained weight after being asthmatic. As the duration of asthma increases it also causes increase in BMI; and with increase in BMI severity of symptoms also increases. Patients with raised BMI are at greater risk of developing co-morbid conditions.

Overweight and obese female patients are declining in life style conditions with greater activity limitations. Further studies are required to find out the exact mechanism regarding how asthma causes obesity and change in weight should be observed with greater sample size.

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*If the plan doesn't work,
change the plan, not the goal.*

– Unknown –

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Qurat-ul-Ain	Design study, Data collection, Manuscript writing.	
2	Sehrish Ali	Design study, Data collection, Manuscript review and editing.	
3	Saanya Hayat	Design study, Data collection.	
4	Imran Amjad	Study Approval, final review of manuscript.	