

# Anthropometric measurements in PCOS & Non PCO Infertile patients

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**Abstract**—These Background: Body mass index (BMI) and waist/ Hip (W/H) ratio are commonly used anthropometric measurements. These parameters are subjected to alteration in the infertile patients particularly those with polycystic ovary syndrome (PCOS).

The aim of this study was to determine these anthropometric measurements in the infertile patients, both with polycystic ovaries (PCO) & Non PCO.

Patients & methods: The study included (130) PCO patients and (173) Non PCO patients. The diagnosis of PCOS was made according to the clinical, hormonal & ultrasonic data. Both BMI & W/H ratio were determined and the results were compared for their statistical significance by unpaired T test.

Results: According to the BMI, in the PCO group; (13) patients had normal weight, (37) were over weight & (65) were obese. The mean BMI was (31.4), while in the non PCO group; (45) patients had normal weight, (62) were over weight & (57) were obese. The mean BMI was (28.5).

In regard to the W/H ratio, in the PCO group (93) patients were below (0.85), while the other (37) patients had android obesity. The mean W/H ratio was (0.8), while in the non PCO group (120) patients were below (0.85) and (53) patients had android obesity (W/H > 0.85). The mean W/H ratio was (0.81).

Discussion & conclusion: This study showed that BMI is significantly higher in the infertile group due to PCO than the other infertile group due to other causes, while the W/H ratio showed no significant difference between the two groups.

**Keywords**— Polycystic disease, Ovary, Body mass index, Hip west ratio.

## I. INTRODUCTION

**I**NFERTILITY is a global reproductive health issue [1] and it affects approximately (10%-15%) of the population [2].

Infertility is defined as the inability to conceive after one year of unprotected, adequately timed intercourse [3].

Male causes contribute to about (25 %) of cases of infertility, female causes to (58 %), while (17 %) remain of unknown causes (Unexplained infertility) [4].

Poly cystic ovary syndrome (PCOS) is the most frequent encountered endocrinopathy in women at reproductive age [5].

The following characteristics are very often associated with PCOS; hirsutism, polycystic ovaries, obesity & infertility [6].

The aim of this study is to compare the anthropometric measures in two groups of infertile patients; those with PCOS and those with infertility due to other causes.

## II. PATIENT & METHODS

Two groups were included in this study; one infertile group due to PCOS (130 patients) and the other were infertile due to other causes (173 patients).

Patients were assigned to have PCOS depending on clinical, laboratory and ultrasonic data.

For all patients, complete medical and gynecological history was taken, hormonal assessment was done, and ultrasonic study was conducted.

In addition, the body mass index was determined by the following equation: BMI= Weight/Length in m<sup>2</sup> [7].

Then the waist/Hip ratio was measured. Dresser makers tape was used taking care that it was applied horizontally. Waist girth was measured at midpoint between the iliac crest and lower margin of the ribs. Hip girth was recorded as the maximum circumference around the buttock posteriorly and indicated anteriorly by the symphysis pubis.

Then patients were divided into groups according to their BMI and W/H ratio as shown in the following table:

TABLE I  
BMI GROUPS

Group	BMI
Underweight	<18.5
Normal	18.5-24.9
Overweight	25-29.9
Obese	30-39.9
Morbid obesity	> 40

TABLE II  
W/H RATIO GROUPS

Group	W/H ratio
Underweight	< 0.85
Morbid obesity	> 0.85

## III. RESULTS

In this study there were (130) patients with PCOS, their ages ranged from (17-42) years with mean of (27.4) years. The age groups of these patients are shown in (fig 2).

According to the BMI, (13) patients had normal weight,

(37) were over weight & (65) were obese (Fig. 4). The mean BMI was (31.4).

The W/H ratio was below (0.85) in (93) patients, while the other (37) patients had android obesity (Fig 6). The mean W/H ratio was (0.8).

Also the study includes (173) patients with infertility due to other causes, their ages ranged from (17-44) years, with mean of (29.02) years, the age groups of these patients are shown in (fig 1).

According to the BMI, (45) patients had normal weight, (62) were over weight & (57) were obese (Fig 3). The mean BMI was (28.5).

The W/H ratio was below (0.85) in (120) patients, while the other (53) patients had android obesity (Figure 5). The mean W/H ratio was (0.81).

The following table summarizes the means and standard deviations of the BMI and W/H ratio of both groups.

TABLE I  
MEANS AND STANDARD DEVIATIONS OF THE BMI AND W/H RATIO OF BOTH GROUPS

Group	PCO group		Non PCO group	
	Mean	S.D.	Mean	S.D.
BMI	31.36	6.07	28.45	5.53
W/H	0.81	0.065	0.81	0.064

The difference in the BMI between the two groups is statistically highly significant (P value: < 0.0001 Unpaired T test), while the difference in the W/H ratio is insignificant.

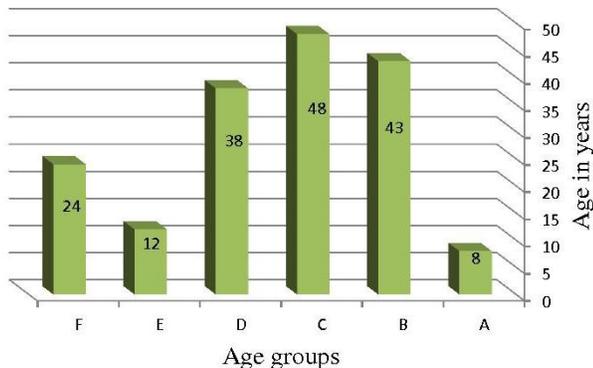


Fig. 1 Age groups in non PCO patients

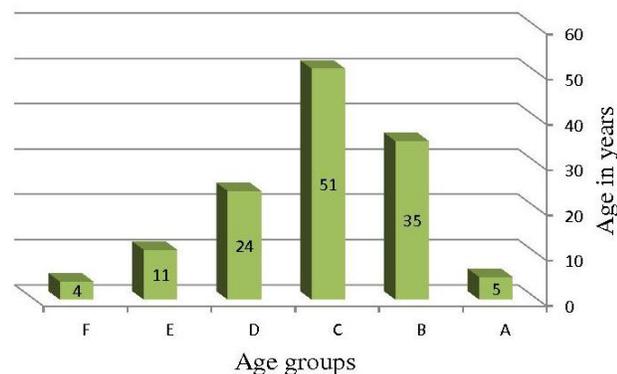


Fig. 2 Age groups in PCO patients  
A: > 20 years B: 20-24 years C: 25-29 years D: 30-34 years  
E: 35-39 years F: > 40 years

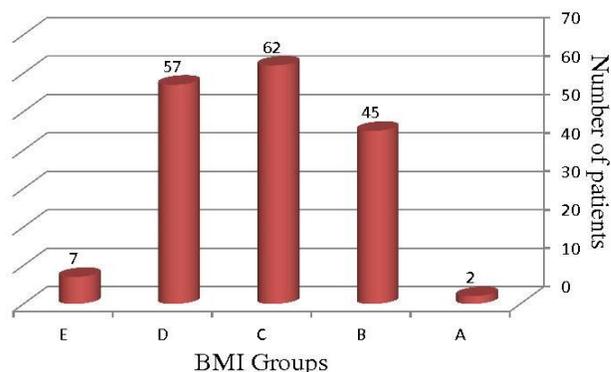


Fig. 3 BMI in Non PCO patients

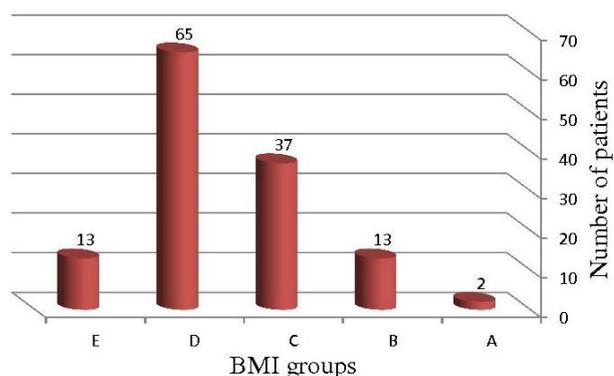


Fig. 4 BMI in PCO patients  
A: < 18.5 B: 18.5-24.9 C: 25-29.9 D: 30-39.9 E: > 40

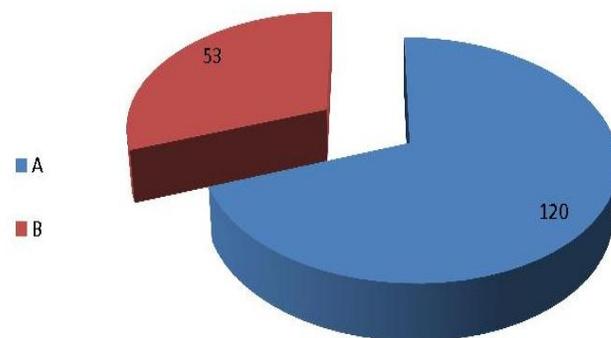


Fig. 5 W/H ratio In Non PCO groups

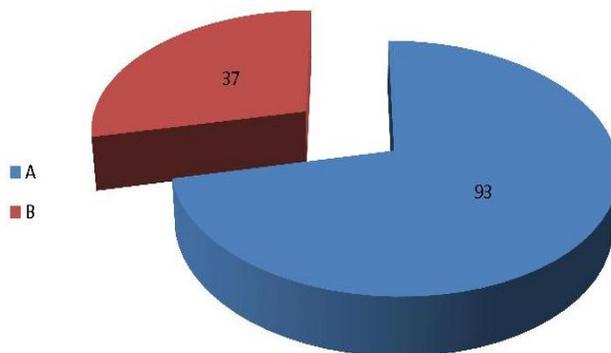


Fig. 6 W/H ratio in PCO patients  
A: < 0.85 B: ≥ 0.85

#### IV. DISCUSSION

Obesity is common, most investigators find at least one half of women with PCOS are obese, upper body obesity, and with a waist/hip ratio of greater than (0.85) [8].

In present study, it was found that most of the patients whether in the infertile group due to PCO or the infertile group due to Non PCO are overweight, obese or had morbid obesity. Probably this is due to the high prevalence of obesity in the society.

PCOS was originally described as a triad consisting of obesity, hirsutism & oligomenorrhea/infertility (9).

In one study included (100) PCOS patients, only (21%) were non obese, (23%) were overweight and (56%) were obese [10].

In this study we found that patients with PCO have higher rates of obesity with regards to BMI in comparison to the other infertile group ( $P < 0.0001$ ), But with regards to W/H ratio there was no significant difference between the two groups. The explanation for this finding is that the BMI is a better representative as a parameter of body mass than the W/H ratio while the latter is more informative about the fat distribution in the body.

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