

STUDY OF INCIDENCE OF OBESITY IN NEWLY DIAGNOSED TYPE 2 DIABETICS USING ANTHROPO-METRIC MEASUREMENTS

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ABSTRACT

South Indian population is recognized to be a high-risk group for development of diabetes. The conventional risk factors recognized for development of diabetes in the global scenario are obesity (body mass index; BMI), in particular central obesity (waist and hip W/H ratio). In this study, 352 patients living in urban Mysore city (males 232 and females 120) diagnosed for the first time as diabetics as per American Diabetes Association (ADA) guidelines were examined with anthropometrics measurements. In males the average fasting blood sugar (FBS) and post-prandial blood sugar (PPBS) were 185 ± 70 and 292 ± 96 mg/dl respectively and in females the average FBS and PPBS were 189 ± 73 and 296 ± 19 mg/dl respectively. In this study, females were found to be mildly overweight at diagnosis (BMI 25.35 ± 4.65) where as males were within the Indian standard for BMI. Waist measurement in males was 90.01 ± 10 cm and in females 85 ± 12 cm. They were within the Indian standard for waist index. W/H ratio in males and females was also with in the Indian standard for W/H ratio. The BMI of majority of patients (both males and females) was in the range of 23-27. Similarly the waist measurement in males was between 80-100 cms and in females it was 80-90 cm. By these data the conclusion is that significant obesity is not a common occurrence in the study population.

KEY WORDS: South-Indian population; Type 2 diabetes mellitus; Obesity; Anthropometric measurements, BMI.

INTRODUCTION

The conventional risk factors recognized for development of diabetes in the global scenario are obesity (BMI) in particular central obesity (waist and W/H ratio) (1-3) India, particularly South Indian population, is recognized to be a high-risk group for development of diabetes (4, 5). In the present study

the parameters like height, weight, BMI, waist, W/H ratio as given by WHO guidelines (6) were evaluated to look at the incidence of obesity/central obesity in patients diagnosed as type 2 diabetes.

MATERIALS AND METHODS

This clinical study included subject population from Mysore city who came to Apoorva Diabetes Foundation for diabetes evaluation. 352 adult patients who were diagnosed for the first time as type 2 diabetics were included in this study (males 232 and females 120). Blood glucose were routinely analyzed by GOD-POD method (7) according to the manual instruction supplied by the manufacturer Erba Diagnostics (Mannheim GmbH, Germany Erba chem.-7 analyzer.

Anthropometric measurements like height, weight and waist were recorded using standardized measuring tape and weighing scale. BMI and W/H ratio were derived by using these anthropometric data.

RESULTS

The study population was diagnosed to have diabetes by ADA guidelines (8). In males, the average FBS and PPBS were 185 ± 70 mg/dl and 292 ± 96 mg/dl respectively; in females, it was 189 ± 73 mg/dl and 296 ± 19 mg/dl.

The patients' height and weight were measured to calculate BMI. The average height in males was 1.66 ± 0.06 meters and in females 1.53 ± 0.06 meters. The average weight in males was 66 ± 10 kg and in females 59 ± 12 kg.

The average BMI in males was 23.88 ± 3.2 Kg/m² and in females 25.35 ± 4.65 (Fig. 1 A). The BMI analyzed in quintiles (Fig. 1 B), showed similar distribution. Waist measurements in males were 90.01 ± 10 cm and in females 85 ± 12 cm (Fig. 2 A).

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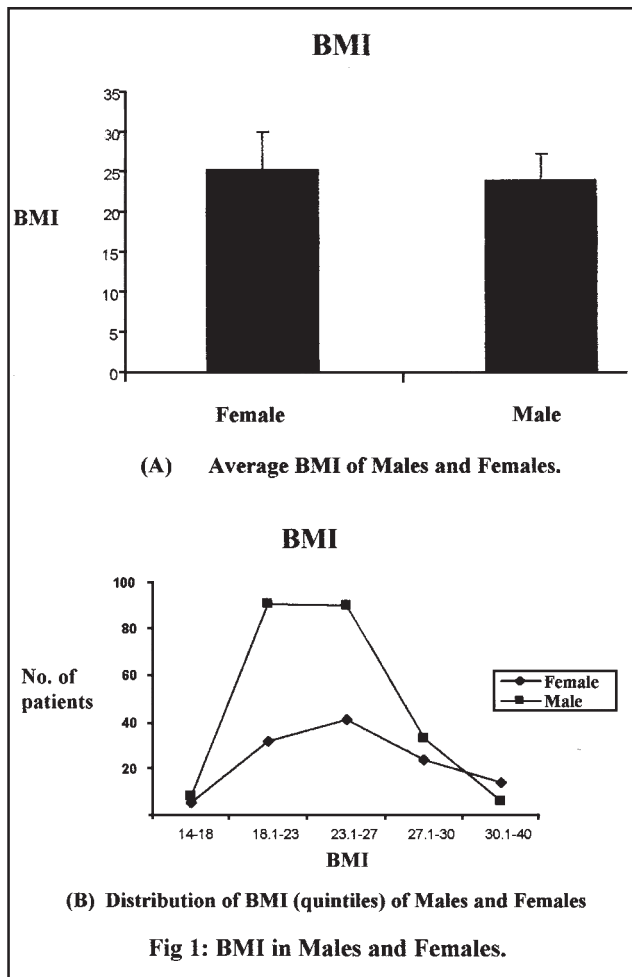


Fig 1: BMI in Males and Females.

Majority of the male patients had a waist measurement in the range of 91-100 cm where as majority of females were in the range of 81-90 cm (Fig. 2 B). The W/H ratio in males was 0.92 ± 0.05 and in females 0.83 ± 0.05 (Fig. 3 A). W/H ratio in majority of males was in the range of 0.81-1.0 and in females 0.71-0.9 (Fig. 3 B).

The relationship of FBS to BMI showed that the majority of patients (males and females) had a BMI in the range of 23-27 (Fig. 4 A and B). Similarly relationship of FBS to waist measurement was between 80-100 cm for males and 80-90 cm for females (Fig. 5 A and B).

DISCUSSION

In this study conducted in Mysore, Karnataka state, South India, the anthropometric data of 352 newly diagnosed diabetic patients was recorded. South Indian population is recognized as a high-risk group for the development of diabetes. In the developed countries obesity is considered to be a significant risk factor for development of diabetes. In the present

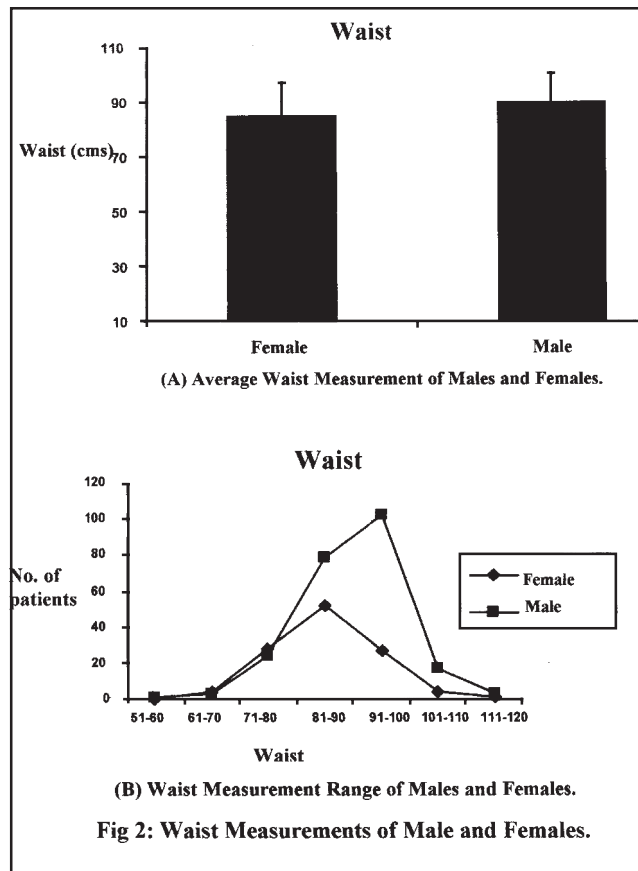


Fig 2: Waist Measurements of Male and Females.

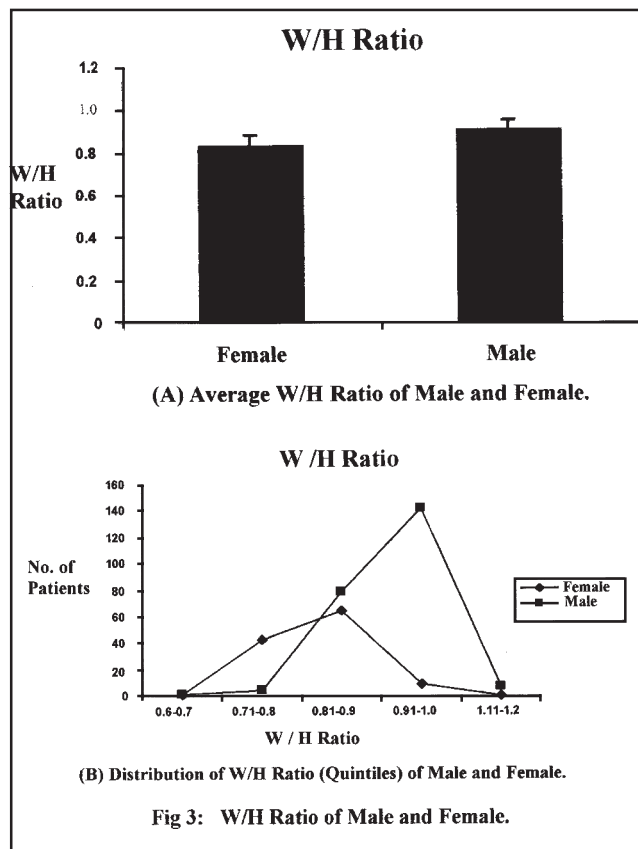


Fig 3: W/H Ratio of Male and Female.

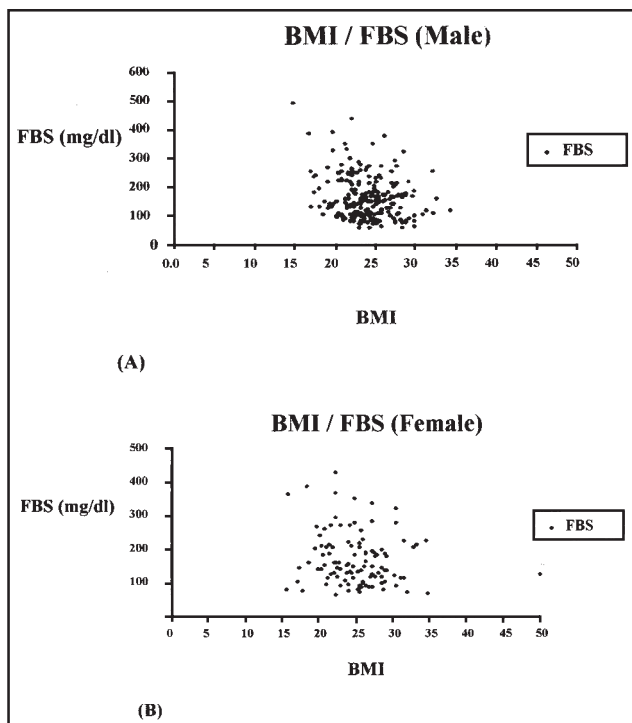


Fig 4: BMI / FBS of Male (A) and Female (B).

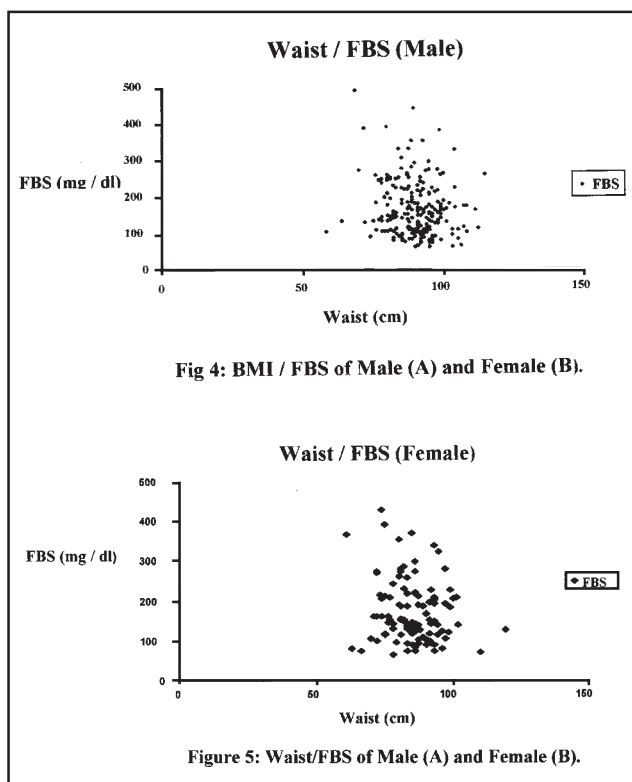


Figure 5: Waist/FBS of Male (A) and Female (B).

study BMI of diabetics both in male and female was in normal range. Similarly W/H ratio was in normal range as per WHO guidelines (6). The waist measurement in males was slightly higher. Surprisingly waist measurement in females was in normal range. The data in the present study reveals that significant obesity is not commonly seen in males. This is in contrast to the data available in the developed countries (1 - 3). Significant obesity may be a co-morbid condition along with type 2 diabetes in South India as evidenced by this study data. Risk factors for the development of diabetes may not be the same for different ethnic groups. Therefore, further studies are required to elucidate other risk factors for the development of diabetes in different ethnic groups.

ACKNOWLEDGEMENT: The authors wish to thank all the participants of the study. We acknowledge the assistance rendered by Dr. Darshan, Mr. Raghu, Mr. Aslam and Mr. Chandrashekar in completion of this study.

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