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Anthropometric Profile of Type II Diabetes Patients Enrolled in a Lifestyle Modification Programme in Rural Medical College

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Abstract

Background: Diabetes promises to be the most daunting public health challenge for India in the near future. The global figures on diabetes, released by the International Diabetes Federation (IDF), have raised a serious alarm for India. India is presently home to 62 million diabetics — an increase of nearly 2 million in just one year. By 2030, India's diabetes numbers are expected to cross the 100 million marks. ***Aim***: To evaluate the Anthropometric profile of type II diabetes patients enrolled in a lifestyle modification programme. ***Material and methods:*** Present study was a Descriptive longitudinal study carried out among 120 diabetic patients in Ahmednagar district in Western Maharashtra. All patients coming to Urban health centre and known case of type II diabetes on OHA were considered for the study. Patients were followed up upto 12 months. Baseline anthropometric measurement were noted. Age, gender, Weight, height, BMI, waist circumference, hip circumference, Waist to hip ratio were calculated. This patients were told about lifestyle modification skills like, antigravity exercises, diet, deaddiction, yogasanas etc. then they were followed up at 6 months and 12 months. Again anthropometric parameters were measured and final analysis was done. ***Results*:** The mean age was 52.60 years (SD=9.52). In present study, anthropometric parameters like weight, BMI, waist circumference, hip circumference and waist to hip ratio were observed over a period of 1 year. For this, type II diabetes mellitus patients were included in the study and change in anthropometric parameters were observed at the end of 6^{th} month and then at the end of 12^{th} month. ***Conclusion***: Present study showed that lifestyle modifications play a very important role in manging the anthropometric parameters among obese/ Diabetic patients. Antigravity exercises and diet show very good impact on the physical as well as mental wellbeing of the individual. Lifestyle modifications and skills should be promoted and added as a part of standard treatment protocols in manging the Diabetic cases.

Keywords: Anthropometric, Diabetes Mellitus, BMI.

INTRODUCTION

Diabetes mellitus is a silent global epidemic. Type 2 Diabetes forms a major chunk of diabetes cases. The prevalence is increasing rapidly among low- and middle-income countries [1] including in Asia and Africa, where most patients will probably be found by 2030 [2].

Globally –

- According to 2017 International Diabetes Federation (IDF) statistics, approximately 425 million people with diabetes worldwide [1].
- The number is projected to almost double by 2030 [3].

India –

- Diabetes currently affects more than 62 million Indians, which is more than 7.1% of the adult population [4].
- The average age on onset is 42.5 years [5].
- Nearly 1 million Indians die due to diabetes every year [6].

Diabetes promises to be the most daunting public health challenge for India in the near future. The global figures on diabetes, released by the International Diabetes Federation (IDF), have raised a serious alarm for India. India is presently home to 62 million diabetics — an increase of nearly 2 million in just one year. By 2030, India's diabetes numbers are expected to cross the 100 million mark.

According to the Indian Heart Association, India is projected to be home to 109 million individuals with diabetes by 2035 [3]. A study by the American Diabetes Association reports that India will see the greatest increase in people diagnosed with diabetes by 2030 [7].

Diabetes is thus, a major public health epidemic. Despite recent pharmaceutical and technological advances, the treatment that is most effective in ensuring glycemic control and prevention of long-term complications of Diabetes still remains lifestyle modifications.

According to SDGs (3.4), by 2030 reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being [8].

The increase in incidence in developing countries follows the trend of urbanization and lifestyle changes, including increasingly sedentary lifestyles, less physically demanding work and the global nutrition transition, marked by increased intake of foods that are high energy-dense but nutrient-poor (often high in sugar and saturated fats, sometimes referred to as the Western pattern diet [1, 3]. Approximately 50% of T2D patients will need insulin therapy within ten years of diagnosis [3]. Although in the past diabetes has been called chronic and irreversible, the paradigm is changing [4, 5].

A significant number of studies indicate that diabetes reversal is achievable using bariatric surgery, while other approaches, such as low-calorie diets (LCD) or carbohydrate restriction (LC), have also shown effectiveness in an increasing number of studies. The ultimate goal of diabetes management is prevention of long-term complications. An important means to this end is improvement and maintenance of glycaemic control over time. Unfortunately, this is not a simple task due to the progressive nature of the disease, which requires timely optimization of treatment, leading in a majority of cases to insulin therapy. In all areas of clinical practice, use of insulin tends to be delayed and irreversible complications can already be present by the time it is started. Average HbA_{1c} at the time of beginning insulin was 80 mmol/mol (9.5%) and ~90% of the participants already had some kind of complication [2]. Type 2 diabetes is characterized by progressive β-cell (β-cell) failure, but the natural history of β-cell decline is variable and assessment of β-cell function is difficult. Beyond the problem of assessing the need for insulin, exogenous insulin has potential effects that frequently worry both people with diabetes and health care professionals [7]. These include hypoglycaemia and weight gain. Fear of injections themselves and various negative connotations of insulin therapy [8].

Keeping in mind the success in reversal of diabetes by Dr. Neil Bernard [9] and Dr. Pramod Tripathi [10] the present study is undertaken in Ahmednagar district.

Aim: To evaluate the Anthropometric profile of type II diabetes patients enrolled in a lifestyle modification programme.

MATERIAL AND METHODS

Present study was a Descriptive longitudinal study carried out among 120 diabetic patients in Ahmednagar district in Western Maharashtra. All patients coming to Urban health centre and known case of type II diabetes on OHA were considered for the study. Patients were followed up upto 12 months. Baseline anthropometric measurement were noted. Age, gender, Weight, height, BMI, waist circumference, hip circumference, Waist to hip ratio were calculated. This patients were told about lifestyle modification skills like, antigravity exercises, diet, deaddiction, yogasanas etc. then they were followed up at 6 months and 12 months. Again anthropometric parameters were measured and final analysis was done. All data was collected and compiled in Microsoft excel and analysed using SPSS version 20. Respective test of analysis was applied wherever required.

Inclusion Criteria

1. Patient with known case of type II diabetes on OHA
2. Willing to come for follow-up every 3 months till one year

Exclusion Criteria

1. Not willing for follow-up
2. People following multiple therapy

RESULT

The mean age was 52.60 years (SD=9.52).

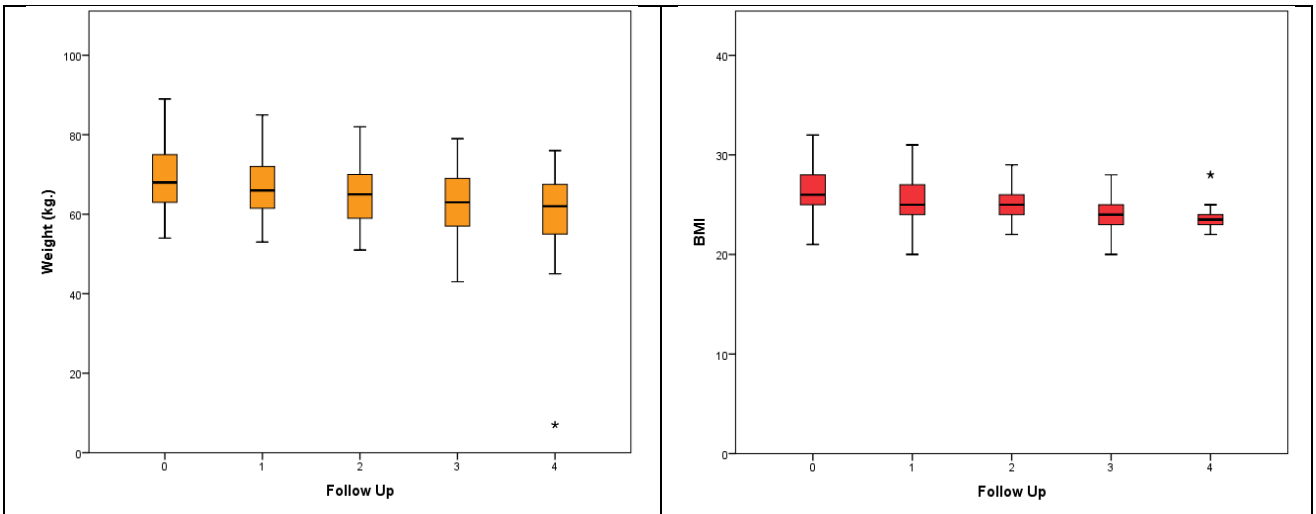
Table 1

AGE GROUP (YEARS)	FREQUENCY		TOTAL
	Male	Female	
31-40	10(8.33%)	4(3.37%)	14(11.7%)
41-50	28(23.33%)	6(5%)	34(28.3%)
51-60	37(30.83%)	14(11.66%)	51(42.5%)
61-70	11(9.16%)	6(5%)	17(14.2%)
71-80	2(1.66%)	2(1.66%)	4(3.3%)
Total	**88(73.33%)**	**32(26.66%)**	**120(100%)**

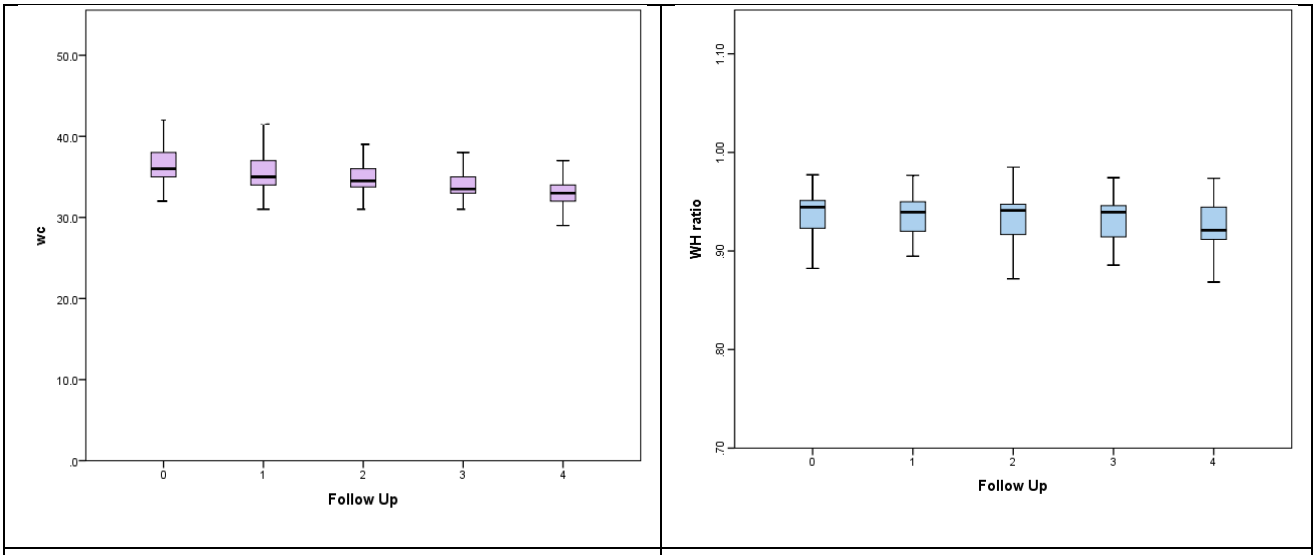
Table 2: Comparison of Mean values of Outcome measures over Follow up Period

Outcome Variables	Baseline		At 6 month Follow Up		At 12 month Follow Up		Repeated Measures ANOVA
	Mean	SD	Mean	SD	Mean	SD	
Weight (kg.)	68.57	9.26	64.87	8.05	60.1	10.1	Wilk's λ=0.059 F=462.221 P<0.001
BMI (kg/m^2)	26.41	3.28	24.84	2.39	23.4	1.48	Wilk's λ=0.315 F=62.946 P<0.001
Waist Circumference (inch.)	36.88	2.7	34.92	2.2	32.92	1.72	Wilk's λ=0.168 F=144.048 P<0.001
Hip Circumference (inch.)	39.56	3.7	37.75	3.1	35.88	2.61	Wilk's λ=0.188 F=124.895 P<0.001
Waist: Hip ratio	0.93	0.04	0.92	0.04	0.919	0.04	Wilk's λ=0.741 F=10.146 P<0.001

Table 2 shows the mean values of anthropometric parameters of the study population.



C] Body Weight **D] BMI**



G] Waist Circumference | **H] Waist: Hip ratio**

Figure 1: Boxplots Showing Outcome Variables Across Follow up Period

Table 3: Waist to hip ratio

	Waist: Hip Ratio		Chi Square Test
	Normal	Abnormal	
Baseline	93	27	**P=0.008**
At the end of 6th month	97	23	
At the end of 12th month	97	23	

DISCUSSION

In present study, anthropometric parameters like weight, BMI, waist circumference, hip circumference and waist to hip ratio were observed over a period of 1 year. For this, type II diabetes mellitus patients were included in the study and change in anthropometric parameters were observed at the end of 6th month and then at the end of 12th month.

In present study of 120 patients, we found that mean baseline weight was 68.57kg then at the end of 6th month 64.87kg and at the end of 12th month it was 60.10kg mean baseline BMI was 26.41kg/m^2 then at the end of 6th month 24.84 kg/m^2 and at the end of 12th month it was 23.40 kg/m^2 mean baseline waist circumference was 36.88 inches then at the end of 6th month 34.92 inches and at the end of 12th month it was 32.92 inches mean baseline hip circumference was 39.56 inches then at the end of 6th month 37.75 inches and at the end of 12th month it was 35.88 inches mean baseline waist to hip ratio was 0.93 then at the end of 6th month 0.92 and at the end of 12th month it was 0.91. Baviskar *et al.*, [11] found that such lifestyle modifications when implemented in resource poor urban settings lead to significant improvement in glycemic control, self care & quality of life along with anthropometric profile.

A report by WHO has studied the determinants associated with treatment adherence and identified common barriers to treatment adherence [12]. Social & Economic Factors: Elderly individuals reported difficulty in adherence to physical activity and regular follow up. Lack of support from family was a barrier reported to adhere to dietary norms. Cost of care was also a barrier. Health System related Factors: Poor relation between patient and Physician, Lack of availability of medications and distance of healthcare facility from home.

A study conducted in tribal population showed that patients may be leaner and yet show poor glycemic control [13].

Bhopal RS, Anne Douglas *et al.*, (2014) in their paper 'Effect of a lifestyle intervention on weight change in south Asian individuals in the UK at high risk of type 2 diabetes: a family-cluster randomised controlled trial' published in *Lancet Diabetes Endocrinology* have given life style intervention to people [14] with impaired glucose tolerance for weight reduction. Of 1319 people who were screened with an oral glucose tolerance test, 196 (15%) had impaired glucose tolerance or impaired fasting glucose and 171 entered the trial. Of 156 family clusters that were randomised (78 families with 85 participants were allocated to intervention; 78 families with 86 participants were allocated to control). 167 (98%) participants in 152 families completed the trial. Mean weight loss in the intervention group was 1.13 kg (SD 4.12), compared with a mean weight gain of 0.51 kg (3.65) in the control group, an adjusted mean difference of –1.64 kg (95% CI –2.83 to –0.44). They have concluded that modest, medium-term changes in weight

are achievable as a component of lifestyle-change strategies.

Capacity building of health workers can facilitate implementation of national programs [15].

Avery *et al*., (2013) in their systematic review of 'Changing physical activity behaviour in type 2 Diabetes', studied 17 RCTs. They found that studies show statistically significant increase in objective and self-reported exercise, HbA1c and BMI [16].

Chamukuttan Snehlata *et al.,* (2003) in their study on anthropometric profile state that in Asian Indian subjects published in Diabetes Care state that the risk association with diabetes and cardiovascular diseases occurs at lower levels of BMI when compared with the white population. This is attributed to body fat distribution; Asian Indians tend to have more visceral adipose tissue, causing higher insulin resistance, despite having lean BMI [17].

Norris *et al*., (2001) in a systematic review of RCTs on Effectiveness of Self Care training in type 2 Diabetes studied a total of 72 studies from 84 papers and made following observations. Interventions targeting on lipid levels, physical activity, weight and blood pressure control showed variable results [18]. This program can be incorporated and scaled up by public health professionals. Adequate training of healthcare workers in conducting community based outreach activities using appropriate technology must be promoted [19].

CONCLUSION

Present study showed that lifestyle modifications play a very important role in manging the anthropometric parameters among obese/ Diabetic patients.

Which in turn helps in keeping the blood sugar levels in normal range which further helps diabetic cases to prevent further complications.

Antigravity exercises and diet show very good impact on the physical as well as mental wellbeing of the individual. Lifestyle modifications and skills should be promoted and added as a part of standard treatment protocols in manging the Diabetic cases.

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