

## VARIATION OF BMI AS PER PRAKRITI IN DIABETIC AND HYPERTENSIVE INDIVIDUALS BY WALKING

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### ABSTRACT

**Study purpose:** To assess the variation of BMI after 3 months of physical exercise (walking) as per *Prakriti* (constitution) in hypertensive and diabetic individuals. **Aim:** To explore control of BMI by exercise as per *Prakriti* (Constitution) in hypertensive and diabetic individuals. **Setting:** Isotonic exercises have been performed by the patients from O.P.D. of Banaras Hindu University and some patients of *Mummukshu bhawan Kashi*, Varanasi. **Contestants:** one hundred sixty seven patients completed 3 months isotonic exercise assessment. **Interventions:** Short-term exercise therapy (3 months). **Measurements:** Variations in BMI after walking as per *Prakriti* in hypertensive and diabetic individuals. **Results:** After 3 months of exercise, there were statistically significant decrease in all BMI scores for hypertensive exercise (HTNE) group ( $p < 0.01$  HS) in *Vata- Pitta Prakriti* individuals, while increase in BMI was found in HTNC (Hypertensive control group) ( $p < 0.01$  HS). No significant change was noted in diabetic exercise (DME) individuals ( $p > 0.05$ ) in the all three *Prakriti* while increased BMI was observed in DMC (Diabetic control) group in *Vata-Pitta* individuals  $p < 0.001$  (HS). **Conclusion:** Short-term exercise therapy has shown encouraging results in terms of decrease in BMI for hypertensive and individuals while no significant result was observed in diabetic exercise group.

**Key words:** Exercise, Hypertension, Diabetes, BMI.

### INTRODUCTION

The aim of this study was to control body mass index through physical exercise (walking) as per *Prakriti* of individuals. The BMI is the actual body weight divided by the height squared ( $\text{kg}/\text{m}^2$ ). This index provides acceptable assess of obesity in people who are not hypertrophied athletes. So, it is the most important tool to access the obesity. Obesity increases the causation of many abnormalities like high cholesterol level, high blood pressure, metabolic syndrome, coronary heart disease, heart failure, diabe-

tes or high blood sugar level (insulin resistance or pre-diabetes), cancer of breast, uterus, ovaries, colon, prostate, kidney and pancreas, Gallstones and other gallbladder disorders. Walking is an important measure to control the obesity. Ayurveda as the science of living, which is based on the principles of nature, focuses on the balance of the physiological functions to maintain perfect health and health of healthy person. The *doshas* like *vata*, *pitta* and *kapha* represents the variations, improper interaction of sense and sense objects; unwhole-

some acts performed by body and mind are all responsible for the disturbance of *doshas*. *Ahara* (diet) and *vihara* (physical exercise) play a crucial role towards maintaining the body in a state of perfect health. Qualitative and quantitative, unchangeable preponderance of *dosha* from birth to death is called as *Prakriti*, a deciding factor during prognosis and treatment of diseases. *Prakriti* is a state which is formed at the time of fertilization due to renown of *Dosha*.<sup>[1], [2]</sup>

**Methodology:**

**Range of cases:**

All these cases of Hypertension, Diabetes mellitus individuals were registered from Kayachikitsa O.P.D., IMS, BHU, for the duration of Jan 2009 to Jan 2011 and some individuals were enrolled from the Kashi Mumukshu, Bhavan, Assi, Varanasi. The selection was random irrespective of sex, occupation and socioeconomic deliberation. All the patients belonged to age group of 35 to 65 years. One follow up has been assessed during the research work i.e. initially, after 3 months.

In the present work effect of physical exercise (walking) has been observed among diabetic and Hypertensive individuals through BMI as per *Prakriti* (constitution). Isotonic exercise was prescribed for Diabetic and hypertensive patients for 3 months. Our study group divided into four groups

1. Diabetic control (DMC)
2. Diabetic exercise (DME)
3. Hypertensive control (HTNC)
4. Hypertensive exercise (HTNE))

**INCLUSION CRITERIA FOR DIABETIC AND HYPERTENSIVE INDIVIDUALS:**

In all the groups, subjects aged from 35 years to 65 years were included. Diabetic patients who did not perform breathing exercise, Patients suffering from Diabetes mellitus on the basis of ADA classification of blood sugar level and fasting blood sugar level (F) above 110 and post prandial (PP) above 140 mg/dl. Diabetic exercise groups were considered as those performed breathing exercise and blood sugar level as above. Hypertensive Patients who did not perform exercise and had high normal, mild and moderate essential hypertension cases without any complication and blood pressure under high normal range systolic above 129 mm Hg and diastolic above 84 mm Hg. Hypertensive Patients carried out exercise.<sup>[3],[ 4], [5]</sup>

**EXCLUSION CRITERIA FOR DIABETIC AND HYPERTENSIVE INDIVIDUALS:**

In all the groups, individuals aged below 35 years and above 65 years were excluded. **Diabetic Control group:** Patients suffering from any secondary diseases, diabetes mellitus with complication like diabetic nephropathy, retinopathy, neuropathy etc and diabetic exercise group who had unable to perform exercise. Mild / moderate hypertension cases with complications such as cerebro-vascular diseases, coronary artery diseases, renal diseases, cardiac heart failure, cardiomyopathy, and any degree of heart blocks, pre-clampsia /eclampsia, Secondary hypertension like Cardiac, renal or hormonal i.e. pheochromocytoma etc.

**OBSERVATIONS AND RESULT:**

**Table number 1: Incidence of Gender as per group**

SEX	Group					
	HTNC	HTNE	DMC	DME	Total	%
Male	21	34	16	28	99	59.3

<b>Female</b>	13	16	16	23	68	40.7
<b>Total</b>	34	50	32	51	167	100

The present work comprised a study of 167 cases. Out of these, 83 were diabetic (44 males, 39 females) and 84 patients (55 male, 29 females) were hyper-

tensive. This distribution can be seen from **table number 1**.

**Table number 2: Number of cases as per Prakriti**

Prakriti	Sex				Total	
	Hypertensive		Diabetic			
	Number of Cases	%	Number of Cases	%	Number of Cases	%
<b>VP</b>	48	57.1	57	68.7	105	<b>62.8</b>
<b>PK</b>	14	16.7	17	20.5	31	<b>18.6</b>
<b>VK</b>	22	26.2	9	10.8	31	<b>18.6</b>
<b>Total</b>	<b>84</b>	<b>100</b>	<b>83</b>	<b>100</b>	<b>167</b>	<b>100</b>

**Table no 3: Effect of exercise on BMI per Prakriti in different groups**

Group	Prakriti	BMI (Kg/mt <sup>2</sup> ) (Mean ±S.D)		Intragroup Comparison Paired t-Test Initial vs F1
		Initial	After 3 months	
<b>HTNC</b>	VP (n=19)	23.95±2.47	24.12±2.48	p<0.01 (HS)
	VK (n=7)	26.56±5.06	26.91±5.27	p<0.05 (S)
	PK (n=8)	27.85±3.44	27.49±3.53	p>0.05 (NS)
<b>HTNE</b>	VP (n=29)	26.41±4.88	24.97±4.63	p<0.01 (HS)
	VK (n=15)	25.89±3.45	24.83±3.66	p<0.05 (S)
	PK (n=6)	27.73±4.85	25.60±4.05	p>0.05 (NS)
<b>DMC</b>	VP (n=23)	25.30±3.04	25.56±3.09	p<0.001 (HS)
	VK (n=3)	25.07±4.83	25.17±4.64	p>0.05 (NS)
	PK (n=5)	23.42±1.83	23.54±2.25	p>0.05 (NS)
<b>DME</b>	VP (n=34)	23.96±4.59	23.04±4.10	p>0.05 (NS)
	VK (n=6)	26.16±1.53	24.48±.7544	p>0.05 (NS)
	PK (n=12)	24.98±4.83	23.13±3.15	p>0.05 (NS)

Present study evidenced that, the individuals of VP Prakriti in HTNC and DMC group demonstrated increase in BMI which is statistically highly significant and HTNE group showed decrease in BMI which was highly significant(p<0.01) A statistically significant (p<0.05) increase was observed in VK Prakriti individuals in

HTNC group. Statistically significant (p<0.05) decrease was observed in VK individuals in HTNE group individuals. **(Table No. 3)**

**DISCUSSION**

Aim of our study is to control the BMI by life style modification through walking and if the BMI is 30-35 reduces

life anticipation by two to four years. While severe obesity BMI >40 reduces life expectancy by 10 year. So, it is prime desire of an individual to control BMI in present era. Increase in BMI is also risk factor for many other diseases like hypertension, heart disease, diabetes and obesity. There is a strong correlation between changing lifestyle factors and increase in hypertension and diabetes in India. Male hypertensive and male diabetic having *VP Prakriti* were more in our study this might be due *Vata prakriti* is worst *Prakriti* as per disease concern among all three *Prakriti* and having low compliance for medication follow-up. Maximum number diseases are characterised by *Vata dosha* in our classic text books. *Pitta Prakriti* individuals are very much prone for metabolic disorder and it might be due to increased metabolism as *Pitta* is secondary *Dosha*. *Vata-Prakriti* having predominance of *raja* guna which initiates the individual for action and more patients visited to O.P.D. Male hypertensive were more in our study. Some previous studies has suggested that method of action responsible for the gender differences in blood pressure control are not very clear, there is significant evidence that androgens, such as testosterone, Play an important role in gender-associated differences in blood pressure regulation. Other previous studies have described that higher plasma rennin activities in postmenopausal women than in premenopausal women but that Plasma rennin activity is still higher in men than in women of similar age.<sup>[6],[7],[8]</sup> This study is very much consistent with our study because the male hypertensive is more in our study. Hypertensive and Diabetic individuals were belonged to *Vata Pitta Prakriti*. This trend may be indicating that the *Vata* is main *Dosha* responsible for Hypertension and *Pitta dosha* is mainly respon-

sible for hormonal disorder and some previous study has proved the same.<sup>[9]</sup> *VP* individual hypertensive patients have been shown decreased BMI after exercise. Connection investigates between BMI and Blood Pressure showed important positive correlations between them. While the mean systolic and diastolic blood pressures among different BMI categories were assessed, it was found that mean systolic and diastolic blood pressure increased with increasing BMI from lowest BMI to the highest BMI category. Both systolic and diastolic BP increased with increase in BMI level. Some prior studies have conducted among Punjabi girls of Delhi, a significant correlation of BMI with blood pressure was also found.<sup>[10]</sup> Positive relations between BMI and BP have also been reported in other Indian populations.<sup>[11],[12]</sup>

The present study showed BMI as strong analyst of blood pressure and diabetes mellitus. Kumanyika et al. have shown body mass index to be even more strongly related than race to blood pressure and that its effect is similar across surveys in the United State and within sex and racial groups.<sup>[13]</sup> A number of investigators have concluded that among many relevant factors, body mass index is one of the most important predictors of blood pressure. Although customs and genetics have long been known to persuade the distribution of blood pressure levels within a population, these factors seem to have not as much of bearing on the difference in blood pressure levels between populations.<sup>[14]</sup> Maximum number of patients belonged to male in diabetic group. This study was not consistent with other because the maximum numbers of studies have shown high prevalence of female diabetic worldwide and having high BMI.<sup>[15],[16]</sup>

## CONCLUSIONS

Significant decrease was observed in BMI in hypertensive individuals having VP prakriti after walking. So, anthropometric parameter has shown the strong correlations with the prakriti and exercise. VP prakriti individuals are very prone for various diseases. Decrease in BMI was observed but not found statistically significant in Diabetic individuals after walking. Lastly, we can conclude that our study is very effective in BMI management through exercise which is very important risk factor for Diabetic and obese individuals. So, we have to adopt walking in our regular routine to control many life threaten diseases and for health wellbeing. Exercise is very effective in hypertensive individuals to control BMI.

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