

## ANALYSIS OF BODY MASS INDEX AND RANDOM CAPILLARY BLOOD GLUCOSE LEVELS IN THE VEDDAS OF SRI LANKA

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### Introduction

The indigenous people also known as “vedda” are a group of people living in several communities in the dry zone of Sri Lanka. They have a traditional way of life, which has been preserved for centuries. However within the past decade due to urbanization and admixture with the Sinhalese their life styles are gradually changing. But they still lead an active life. The body mass index (BMI) and random capillary blood glucose (RCBG) are considered as risk factors for coronary heart disease and diabetes mellitus. Therefore objective of this preliminary study was to asses these risk factors in the Vedda population.

### Methodology

Four visits were made to Dambana during the period from March to August 2009. Individuals with at least one parent from the vedda clan (Warige) were included in the study.

The heights and weights were measured in meters and kilograms respectively using standard measuring equipments and the BMI [Weight (kg)/Height (m)<sup>2</sup>] was calculated using the quetelet body mass index (Garrow and Webster, 1985). Before measuring the RCBG informed verbal consent was obtained. A drop of blood was taken to the glucose strip by pricking the index finger of the non dominant hand with a lancet. RCBG was measured using a glucometer (Caresens<sup>®</sup>). The measurements were taken by one observer throughout. BMI values less than 18.5kg/m<sup>2</sup> is considered underweight, 18.5-24.9 kg/m<sup>2</sup> as normal range, 25-29.9 kg/m<sup>2</sup> as overweight and above 30 kg/m<sup>2</sup> as obese. The cutoff point for diabetes was considered as a blood glucose reading above 200 mg/dl and impaired glucose tolerance when the reading was between 140-199 mg/dl (Kumar and Clark, 2005)

**Tabel 1. Mean BMI for male and female veddas in different age groups**

| Male      |    |              | Female    |    |              |
|-----------|----|--------------|-----------|----|--------------|
| Age range | n  | Mean±SD      | Age range | n  | Mean±SD      |
| 16-25     | 10 | 19.23 ± 2.10 | 16-25     | 18 | 21.53 ± 4.27 |
| 26-35     | 11 | 20.42 ± 2.19 | 26-35     | 9  | 21.19 ± 2.56 |
| 36-45     | 15 | 21.51 ± 2.81 | 36-45     | 14 | 20.46 ± 3.21 |
| 46-55     | 5  | 21.22 ± 5.61 | 46-55     | 6  | 20.93 ± 2.24 |
| 56-65     | 4  | 24.01 ± 3.37 | 56-65     | 2  | 18.98 ± 6.24 |
| 66-75     | 3  | 19.04 ± 0.78 | 66-75     | 1  | 12.03        |
| 76-80     | 0  |              | 76-80     | 1  | 17.86        |

**Results**

The study sample consisted of 99 veddas (48 males and 51 females). The age ranged from 16 to 80 years. The mean  $\pm$  SD of BMI for male and female veddas were  $20.81 \pm 3.1 \text{ Kg/m}^2$  and  $20.75 \pm 3.65 \text{ Kg/m}^2$  respectively.

In the present study, mean values of BMI for each age group of males were above  $18.5 \text{ Kg/m}^2$ . In females, except in the 66-75 and 76-85 age groups the mean BMI were above  $18.5 \text{ kg/m}^2$ . The accepted international range of BMI values for a healthy adult is  $18.5\text{-}25 \text{ kg/m}^2$ . Out of the total sample,

**Discussion**

Although BMI value alone is not a pure reflection of the nutritional status of an individual it is widely used throughout the world as a useful tool in the diagnosis of obesity and malnutrition. Though 24.24% individuals had BMI values below  $18.5 \text{ kg/m}^2$ , it is questionable whether to consider them as malnourished as majority were otherwise healthy and led an active life.

Eleven percent of the sample had a BMI between  $25\text{-}30 \text{ kg/m}^2$  and was considered as overweight thus

**Table 2. RCBG concentration for different age groups**

| Male      |    |                    | Female    |    |                    |
|-----------|----|--------------------|-----------|----|--------------------|
| Age range | n  | Mean $\pm$ SD      | Age range | n  | Mean $\pm$ SD      |
| 16-25     | 10 | 98.30 $\pm$ 8.04   | 16-25     | 18 | 107.78 $\pm$ 14.02 |
| 26-35     | 11 | 100.27 $\pm$ 9.91  | 26-35     | 9  | 98.33 $\pm$ 3.31   |
| 36-45     | 15 | 100.40 $\pm$ 14.95 | 36-45     | 14 | 110.02 $\pm$ 10.5  |
| 46-55     | 5  | 100.80 $\pm$ 16.75 | 46-55     | 6  | 106.23 $\pm$ 17.58 |
| 56-65     | 4  | 92.25 $\pm$ 7.5    | 56-65     | 2  | 125.00 $\pm$ 7.78  |
| 66-75     | 3  | 104.00 $\pm$ 30.5  | 66-75     | 1  | 100                |
| 76-80     | 0  |                    | 76-80     | 1  | 98                 |

61.61% had a BMI in the range of  $18.5\text{-}25 \text{ Kg/m}^2$ , 24.2% had a BMI less than  $18.5 \text{ Kg/m}^2$ , 11.1% had a BMI values between  $25\text{-}30 \text{ Kg/m}^2$  and 2% had a BMI over  $30 \text{ Kg/m}^2$ . The mean  $\pm$ SD random capillary blood glucose (RCBG) concentration was  $103.34 \pm 13.96 \text{ mg/dl}$  for the entire study population. Mean RCBG for males and females were  $99.52 \pm 13.17 \text{ mg/dl}$  and  $106.86 \pm 13.74 \text{ mg/dl}$  respectively. Range of RCBG values were  $72\text{-}141 \text{ mg/dl}$  for the total sample.

increasing the risk of coronary heart disease and diabetes mellitus. Two percent had values over 30 indicating a higher risk.

In this study all veddas had RCBG values below  $140 \text{ mg/dl}$  except one individual who had a value of  $141 \text{ mg/dl}$ . This ( $140 \text{ mg/dl}$ ) is considered as the lower limit of impaired glucose tolerance. The reason for the use of capillary RBS was due to practical difficulties in obtaining fasting venous blood which is the ideal type of blood for diabetic screening.

Studies carried out in Sri Lanka show a definite upward trend in the prevalence of diabetes mellitus. The largest ever study on the prevalence of diabetes in Sri Lanka was in 2005, which reported a prevalence of 14.2% in males and 13.5% in females (Katulanda, Sheriff and Matthews, 2006).

In the vedda population, with gradual urbanization and admixture with Sinhalese leading to changes in life style, the incidence of non communicable diseases are expected to rise.

The lower percentage of overweight individuals and normal RCBG values observed in this study may be due to their continuous active life style, dietary habits or genetic influence on this population.

### Conclusion

The BMI and RCBG of majority of veddas showed values within the normal range. This reflects a low risk of diabetes mellitus and coronary heart diseases due to obesity and elevated random capillary blood glucose levels in the vedda population.

### References

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