ASSOCIATION OF MARKERS OF OBESITY WITH INSULIN RESISTANCE AND TYPE 2 DIABETES MELLITUS IN A RURAL FEMALE POPULATION

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Obesity leads to the development of insulin resistance (IR), impaired glucose tolerance and type 2 Diabetes Mellitus (T2DM) resulting from a low-grade inflammation of white adipose tissue. This study was conducted to identify the association of anthropometric parameters and bio-impedance analysis (BIA), which are used as markers of obesity, with IR and T2DM. A female population living in Elahera divisional secretariat area was selected using convenient sampling method [25 T2DM subjects and 25 non-diabetic subjects; mean age=41±6 years]. Height, Weight, Waist Circumference (WC), Hip Circumference was estimated using standard protocols and Body Mass Index (BMI) and Waist-to-Hip Ratio (WHR) were calculated. Body Fat percentage (BF%), Visceral Fat level (VF), whole body Subcutaneous Fat percentage (SF%) and whole body Skeletal Muscle percentage (SM%) were assessed using BIA (OMRON HBF-362) analyser. Ten hour fasting blood samples were analysed for fasting blood sugar (FBS) and Insulin level using kits. IR was calculated using HOMA-IR equation (homeostatic model assessment). HOMA-IR values ≥ 2.6 were considered as insulin resistant. Mean IR values among T2DM subjects and controls were 4.5 and 2.5 respectively ($p=<0.05$). 80% of diabetic subjects and 20% of non-diabetic individuals were insulin resistant showing statistically significant association. Only WC and WHR showed significant difference among non-diabetic individuals and diabetic subjects [($p=<0.05$) (WC=81.4 cm, 87.4 cm: WHR = 0.87, 0.91 among non-diabetic individuals and diabetic subjects respectively)]. However, when the whole population was divided in to two groups based on having and not having insulin resistance, BMI, WC, BF%, SF%, and VF levels ($p<0.05$) were significantly higher in the insulin resistant group compared to the non-insulin resistant group (BMI=22.5, 26.2: WC=80.0 cm, 88.1 cm: BF%=32.6, 35.1: SF%=26.6, 30.7: VF=5.57, 8.11 respectively among non-insulin resistant and insulin resistant groups). Thus, the data indicates that the anthropometric parameters and body fat levels are better associated with insulin resistance rather than Type 2 diabetes mellitus.

Keywords: Insulin Resistance, Type 2 Diabetes Mellitus, Obesity

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