A descriptive study on the relationship between visceral Adiposity index and lipid Profile & CRP levels among non-diabetic hypertensive patients attending medical clinics, Teaching Hospital, Jaffna

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Background: Due to the changes in lifestyle, prevalence of non-communicable diseases is also increasing. One among them is the metabolic syndrome, due to excessive calorie intake and sedentary lifestyle, leading increased fat storage. Consumption of high fat diet with increased LDL and lack of exercise increases the fat accumulation, named as Visceral Adiposity. To measure the risk of developing these disorders Visceral Adiposity Index (VAI) is one of the best indicators. The aim of the study was to determine association of Visceral Adiposity Index (VAI) with selected biochemical parameters among non-diabetic hypertensive patients.

Methodology: This is a 12 days descriptive cross sectional study. A total of 55 non-diabetic hypertensive patients were selected among the patients who attended the Medical Clinics, Teaching Hospital, Jaffna. The height, weight and fat mass were measured using standard methods and the Body Mass Index (BMI) and VAI were calculated. Blood samples were collected and the serum LDL, HDL, Total Cholesterol, triacylglycerol and C - reactive protein (CRP) levels were estimated and were correlated with VAI. Ethical clearance had obtained from Ethical Review Committee, Faculty of Medicine, and University of Jaffna. These collections of data were analyzed using SPSS software.

Results: Of the 55 non-diabetic patients (age between 30 and 80 years), 56.4% ($n \leq 41$) were females. Mean BMI of males and females were 24.5 (± 4.11) & 26.1 (± 4.98) kg m^{-2} respectively. Mean VAI values of males and females were 1.8 (± 0.99) and 2.7 (± 1.46) kg^{-1}m^3 respectively. Mean LDL, HDL, Total cholesterol, Triglycerides and CRP levels of male and females were 88.72(± 32.1) & 106.13(± 34.4), mg/dl; 46.55 (± 8.4) & 53.24 (± 10.9) mg/dl; 156.93 (± 37.9) & 183.50 (± 37.3) mg/dl; 139.95 (± 76.3) & 152.41(± 67.8) mg/dl and 1.56 (± 0.76) mg/dl and 1.68 (± 0.81) mg/dl respectively.

When the Hypertensive patients were grouped based on the age in 10 year interval, it was observed that, there were females in the age group of 31-40 years had the highest BMI [36.3 ($\pm$)5.0 kg m^{-2}] and second highest VAI [3.67 (± 1.72) kg^{-1}m^3]. Such odds were not observed among the males. The females (71-80 years) who had the highest VAI values [5.34 (± 0.38) kg^{-1}m^3] also had highest LDL [138.75(± 40.05)

mg/dl)], Total cholesterol [235.0 (±20.0) mg/dl)] triacylglycerol [293.9 (±20.3) mg/dl)] and CRP [3.53 (±0) mg/dl)] levels, while having lowest HDL [46.0(±0.8) mg/dl)] level.The females (41-50 years) who had the lowest VAI values [1.25(±0.54) kg^{-1}m^3] also had lowest LDL [82.5(±27.63) mg/dl)], Total cholesterol [168.7. (±33.19) mg/dl)] triacylglycerol [88.1 (±11.69) mg/dl)] and CRP [1.25 (±0.54) mg/dl)] levels, while having highest HDL [65.83 (±16.45) mg/dl)] level.Among the males highest BMI [27.44(±5.17) kg m^{-2}], VAI [2.24 (±0.44) kg^{-1}m^3], LDL [148.4 (±0) mg/dl], HDL [51.8 (±0) mg/dl], Total Cholesterol [225 (±0.0)mg/dl], Triacylglycerol [168.98 (±80.33)mg/dl] and CRP levels [2.26 (±0.54) mg / dl] levels were observed among those of 51-60; 41– 50, 31-40; 31-40; 31-40; 71-80 and 41 –50 years age group respectively. Among the males lowest BMI [22.56 (±2.4) kg m^{-2}], VAI [1.39 (±0.0) kg^{-1}m^3], LDL [76.17(±11.76) mg/dl], HDL [41.43 (±5.81) mg/dl], Total Cholesterol [141.47 (±19.70)mg/dl], Triacylglycerol [114.94 (±46.19)mg/dl] and CRP levels [1.22 (±0.40) mg / dl] levels were observed among those of 71-80; 31-40; 51 – 60, 41-50; 51-60; 51-60 and 51 –60 years age group respectively.Males who had the highest VAI values [2.24 (±0.44) kg^{-1}m^3] had the highest CRP [2.26 (±0.54) mg /dl] level. The males who had lowest VAI value [31 – 40 years; 1.39 (±0.0) kg^{-1}m^3] had the highest [148.4 (±0) mg/dl], HDL [51.8 (±0) mg/dl], Total Cholesterol [225 (±0.0)mg/dl] levels.

Among the males & females 12.5 & 25.8% were obese, 54.17 & 45.16% were overweight respectively. Mean VAI values [males 2.39 (±1.15) and females 3.23 (±1.84) kg^{-1}m^3] were the highest among the obese subjects. With increase in VAI the plasma triacylglycerol levels [obese subjects males 170.17 (±72.85) and females 177.05 (±80.45)mg/dl; overweight subjects males 131.33 (±56.67) and females 145.39 (±64.65)mg/dl and normal BMI males 107.76(±45.49) and females 141.47 (±48.32) mg/dl]was increased. Among both males and females of obese, overweight and those with normal BMI the LDL to HDL ratios ranged from 2.2 to 1.83.

Conclusion
Among the females, there were two class 2 obese patients belonging to 31 – 40 years. When the patients were classified based on the age, there were direct correlation between VAI and LDL/ HDL ratio; triacylglycerol (Pearson correlation ≤ 0.904; p≤0.00), total cholesterol (Pearson correlation ≤ 0.502; p≤0.00) and CRP (Pearson correlation ≤ 0.790; p≤0.00) levels. When the patients were classified as obese, overweight and with normal BMIthere were direct correlation between VAI and fat mass, LDL/ HDL ratio; triacylglycerol, total cholesterol and CRP levels.