

Association of dysfunctional adiposity index with cardiometabolic risk factors in young adults

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INTRODUCTION:

- Obesity is associated with increased mortality and cardiometabolic diseases.
- Increasing prevalence of obesity and its clinical significance warrants its accurate diagnosis
- Though non invasive tests such as MRI, CT, DEXA accurately measure body fat, they are expensive and not readily accessible.
- BMI is used to define obesity. But it does not differentiate lean body mass and fat mass and hence does not accurately estimate fat content.
- “Central obesity” is excessive accumulation of fat in the abdominal cavity, known as visceral adipose tissue (VAT).
- Waist circumference (WC) assess central obesity, but it could not differentiate VAT from subcutaneous adipose tissue.
- Dysfunctional adiposity index (DAI) was developed as an early marker of cardiometabolic risk, based on adipocyte morpho-functional abnormalities.

AIM AND OBJECTIVES:

The present study aimed to associate dysfunctional adiposity index with cardiometabolic risk factors in young adults.

MATERIALS AND METHODS:

- The present study was a cross sectional study conducted in Clinical Biochemistry Laboratory at Saveetha Medical College
- Young adults of both gender in the age group of 18-40 years were selected by random sampling method from the students and staff of our Institute.
- **Sample size** was estimated to be 200 at 5% level of significance and 80% power
- **Exclusion criteria:** People with known history of cardiovascular disease, renal disease, liver disease, acute illness, autoimmune disease, cancer, thyroid disorder, pregnant women and people consuming lipid lowering drugs or glucocorticoids were excluded from the study
- BMI was calculated by the formula: weight in kg/height in m². WC was measured at mid way between the iliac crest and the last rib. Hip circumference was measured and WHR was calculated. Blood pressure was measured twice in right arm in sitting position using standard mercury sphygmomanometer.
- Fasting blood glucose and serum lipid profile was assayed in the fully automated dry biochemistry analyzer (VITROS 5600). Hypertriglyceridemic waist (HW) phenotype was defined as high triglyceride levels and waist circumference
- **Statistical analysis:** Unpaired t test and ROC curve analysis was done in SPSS software

RESULTS: TABLE 1: Baseline characteristics

Parameters	Males n=100	Females n= 100
Age	30.5+ 2.5	31.4+4.5
Height	167.7+ 6.6	156.4+ 6
Weight	71.5+ 11.2	62.7+ 9.8
BMI	25.4+ 3.3	25.4+ 4
Waist circumference	94.4+ 6.7	87.3+ 10.5
Hip circumference	97.5+ 5.6	99.5+ 8.8
Waist hip ratio	0.96+ 0.02	0.88+ 0.07
SBP	120.4+ 13.8	117.5+ 15.6
DBP	77.6+ 9.4	77.6+ 9.5

TABLE 3: ROC curve analysis – Area under curve

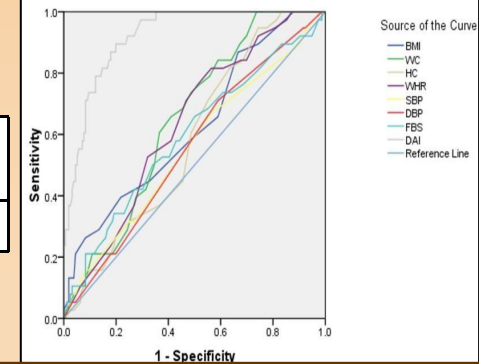
Parameters	AUC for HW phenotype
BMI	0.624
Waist circumference	0.648
Hip circumference	0.584
Waist hip ratio	0.635
SBP	0.554
DBP	0.556
Fasting blood glucose	0.593
DAI	0.920

TABLE 2: Cardiometabolic risk factors

Parameters	Hypertriglyceridemic waist (HW) phenotype	Without HW phenotype	p value
Age	32.2 + 3	31.7 + 3.8	0.183
Height	162.2 + 9.8	161.9 + 8.1	0.225
Weight	71.2+10.9	66.1 + 11.3	0.011*
BMI	26.9 + 3.7	25 +3.6	0.003*
Waist circumference	94.9 + 6.6	89.9 +9.8	0.002*
Hip circumference	100.2 + 6	98.1 +7.7	0.106
Waist hip ratio	0.95+0.05	0.92+ 0.07	0.010*
SBP	121+ 15.9	118.4+ 14.4	0.322
DBP	79.1 +8.9	77.2 +9.5	0.252
Fasting blood glucose	85.5 +21.5	79.7+14.6	0.046*
DAI	2.03 + 0.7	1.07 + 0.4	< 0.0001*

TABLE 4: ROC curve analysis – Cutoff point

Parameter	Cut off point	Sensitivity	Specificity
DAI	1.52	81.6%	85.3%



DISCUSSION AND CONCLUSION:

- DAI was significantly high in subjects with hypertriglyceridemic waist (HW) phenotype. DAI showed maximum area under curve. DAI at cut-off point of 1.52 can predict HW phenotype with 81.6% sensitivity and 85.3% specificity.
- Romero et al found that DAI showed strong and independent association with cardiometabolic abnormalities.
- Adipocyte tissue dysfunction is the key factor in the pathophysiology of obesity related chronic metabolic and cardiovascular diseases.
- DAI, an index of dysfunctional adipocytes is based on accessible routine parameter evaluated in clinical practice. Hence DAI can be considered a practical and economical tool to identify increased cardiovascular risk in otherwise apparently healthy young adults.

BIBILOGRAPHY:

- Valenzuela PL, Carrera-Bastos P, Castillo-García A, Lieberman DE, Santos-Lozano A, Lucia A. Obesity and the risk of cardiometabolic diseases. Nat Rev Cardiol. 2023;20(7):475-494.
- Albaker W, El-Ashker S, Baraka MA, El-Tanahi N, Ahsan M, Al-Hariri M. Adiposity and Cardiometabolic Risk assessment Among University