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RESEARCH ARTICLE

Assessment of a body shape index in patients with normal gated myocardial perfusion SPECT findings

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ABSTRACT

Objective: This study aimed to evaluate the relationship between A Body Shape Index (ABSI) and normal values of gated myocardial perfusion SPECT (g-MPS) parameters.

Materials and Methods: This retrospective cross-sectional study analyzed 329 individuals (188 females and 141 males) who presented to the outpatient clinic of the Department of Nuclear Medicine, Faculty of Medicine, Bolu Abant Izzet Baysal University, and underwent myocardial perfusion scintigraphy (MPS). Anthropometric measurements were obtained before MPS, and g-MPS parameters were retrieved from clinical reports of patients with normal perfusion and gated functional findings. Descriptive statistics, including mean, standard deviation, median, interquartile range, frequency, and percentage, were calculated. Relationships between variables were evaluated using Spearman's rank correlation analysis.

Results: The analysis revealed the following mean values: age, 60.61 years; height, 161.15 cm; weight, 79.41 kg; waist circumference (WC), 95.73 cm; body mass index (BMI), 30.74 kg/m^2; and ABSI, 0.081. A positive correlation was found between BMI and WC ($r = 0.730$, $p < 0.001$). ABSI showed a weak negative correlation with heart rate ($r = -0.124$, $p = 0.025$). Metabolic equivalent of task (METS) values were negatively correlated with BMI ($r = -0.301$, $p < 0.001$) and WC ($r = -0.205$, $p < 0.001$). Additionally, negative correlations were observed between risk level and heart rate ($r = -0.121$, $p = 0.029$), and between ejection fraction (EF) and both end-diastolic volume (EDV; $r = -0.628$, $p < 0.001$) and end-systolic volume (ESV; $r = -0.884$, $p < 0.001$).

Conclusion: In individuals with normal myocardial perfusion findings, ABSI may serve as a complementary anthropometric index, providing additional insight into the relationship between abdominal fat distribution and cardiovascular physiological parameters.

Keywords: body mass index, body shape index, gated myocardial perfusion SPECT, left ventricular function, obesity

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INTRODUCTION

Gated single-photon emission computed tomography (SPECT) is a myocardial perfusion scintigraphy technique that allows quantitative assessment of left ventricular functional and volumetric parameters in addition to myocardial perfusion (1,2). The precision and reproducibility of functional parameters derived from this technique have increasingly highlighted the clinical importance of gated SPECT data (3). Scintigraphy allows for the evaluation of the presence, severity, and distribution of ischemic myocardial segments, along with wall motion abnormalities and ejection fraction (EF), both visually and quantitatively (4,5). Obesity serves as a robust independent risk factor for cardiovascular diseases, with visceral adiposity emerging as a critical determinant of cardiovascular risk (6). Abdominal obesity, defined as abnormal fat accumulation posing health risks, can be assessed via anthropometric measurements (7). These measurements, which are simple, cost-effective, and non-invasive, are widely utilized to evaluate morbidity and mortality risks (8). Commonly used indices include body mass index (BMI), waist circumference (WC), waist-to-hip ratio, waist-to-height ratio, visceral fat area, body fat percentage, and the novel A Body Shape Index (ABSI) (9).

ABSI, a novel anthropometric measure designed to more accurately reflect abdominal adiposity and visceral fat distribution, has attracted increasing attention in recent studies as an alternative to BMI, as it demonstrates a stronger association with cardiometabolic risk than both BMI and WC (10-12).

Studies indicate that abdominal obesity, defined as WC ≥90 cm in men and ≥80 cm in women, doubles the risk of diabetes, hypertension, and atherosclerotic cardiovascular disease (10). Furthermore, ABSI has been proposed as a reliable anthropometric tool for population health surveillance due to its predictive efficacy for chronic diseases and mortality (13). Moreover, in various diseases in which visceral fat distribution is considered a risk factor, ABSI is widely used in clinical practice and has attracted attention due to its high predictive performance (11,14,15). This study aims to investigate the relationship between ABSI and normal parameters of gated myocardial perfusion SPECT (g-MPS).

MATERIALS AND METHODS

In this cross-sectional study, patients who underwent myocardial perfusion scintigraphy (MPS) at the Department of Nuclear Medicine, Faculty of Medicine, Bolu Abant Izzet Baysal University, between May 2023 and February 2024 were evaluated. Anthropometric measurements were obtained before the MPS procedure. Following the procedure, g-MPS images and clinical reports were reviewed, and patients with normal myocardial perfusion and normal gated functional parameters were included in the study.

All included patients had completely normal myocardial perfusion and gated functional findings, with no borderline or equivocal imaging results present in the study population. Patients meeting the inclusion criteria were enrolled in the study on the same day. Patients with paced rhythm, left bundle branch block, right bundle branch block, cardiomyopathy, structural cardiac abnormalities, or myocardial perfusion abnormalities were excluded.

This study received ethical approval from the Bolu Abant Izzet Baysal University Clinical Research Ethics Committee (Decision No: 2023/100).

The study analyzed the following parameters reported in the g-MPS reports: Ejection Fraction (EF), End-Systolic Volume (ESV), End-Diastolic Volume (EDV), Metabolic Equivalent of Task (METS), time to reach target heart rate (duration), and the percentage of achieved target heart rate (heart rate). Age, sex, height, and weight values were recorded from the examination reports. Additionally, WC was directly measured with a non-elastic tape measure for ABSI calculation. Based on the anthropometric measurements of all participants (including height, weight, and WC), BMI and ABSI were calculated. WC (cm) measurements were performed with the participants standing upright,

feet together, and at the end of a normal expiration. The measurement was taken at the approximate midpoint between the lower margin of the last palpable rib and the top of the iliac crest using a measuring tape positioned horizontally and without compressing the skin. This procedure was conducted in accordance with the World Health Organization (WHO) anthropometric measurement protocol (16).

BMI and ABSI were calculated using the following formulas:

$BMI = Weight / Height^2\ (kg/m^2)$.

$ABSI = WC \div (BMI^{2/3} \times Height^{1/2})$ (13,17).

Only cases with g-MPS values within normal physiological limits among those who underwent MPS were included in the analysis. The clinical and demographic parameters analyzed were: age, height, weight, WC, BMI, ABSI, heart rate, duration, METS, EF, ESV, and EDV. This study was conducted on 329 patients (188 female, 141 male) referred to the Nuclear Medicine Clinic for MPS due to suspected Coronary Artery Disease (CAD). Patients underwent a physiological exercise stress test using a treadmill device following the Bruce or Modified Bruce protocol. Upon reaching 85–100% of their age-predicted maximum heart rate, 10 mCi of 99mTc-MIBI was injected, and electrocardiography (ECG)-g-MPS was performed using a two-day protocol. After imaging, the parameters of EF, EDV, and ESV were obtained using QPS/QGS software (Cedars-Sinai Medical Center). Myocardial perfusion was evaluated using a 17-segment model and a five-point scoring system (0 = normal perfusion, 1 = equivocal hypoperfusion, 2 = moderate hypoperfusion, 3 = severe hypoperfusion, and 4 = absent perfusion). Summed stress score (SSS), summed rest score (SRS), and summed difference score (SDS) were calculated. An SDS <2 and an SSS ≤3 were considered indicative of normal myocardial perfusion. Gated-MPS images were interpreted independently by two observers, and in cases of discrepant interpretations, images were re-evaluated jointly and a final decision was reached by consensus.

Percentage of Achieved Target Heart Rate (Heart Rate): This parameter indicates the percentage of the patient's achieved heart rate relative to the age-predicted maximum value calculated as (220 - age). The target heart rate is calculated as (220 - age) × 0.85. If the patient cannot reach 85% due to capacity limitations or symptoms (e.g., chest pain, dyspnea), they are expected to reach at least 70–85%.

Duration: This is the time (in minutes) required to reach the target heart rate.

Metabolic Equivalent of Task (METS): This is a unit measuring myocardial oxygen consumption capacity. At rest, the heart muscle consumes approximately 3.5 mL/kg/min (1 MET) of oxygen. Under stress, the oxygen demand increases, and computer-assisted systems calculate how much higher the oxygen consumption is compared to the resting state. METS values were automatically calculated based on the treadmill exercise protocol.

Ejection Fraction: EF is a critical measure of the heart's stroke volume. It is calculated as the ratio of the difference between the EDV and ESV to the EDV: *EF = (EDV - ESV) / EDV.* An EF value of ≥50% was defined as normal. EF was calculated using EDV and ESV values derived from gated-MPS data. This ratio represents the percentage of the blood volume ejected from the left ventricle during systole. A high EF indicates effective cardiac pumping, while a low EF may suggest heart failure or other cardiac dysfunction.

End-Systolic Volume: ESV is the volume of blood remaining in the left ventricle at the end of systole, after the heart has contracted. It provides information about the efficiency of the heart's pumping function; a low ESV indicates more effective blood ejection, while a high ESV may signal potential heart failure.

End-Diastolic Volume: Represents the maximum volume of blood in the left ventricle at the end of diastole when the heart muscle is relaxed and filled with blood. This parameter is crucial in determining the heart's filling capacity and overall pumping efficiency. A high EDV suggests greater blood intake, which can enhance the strength of cardiac contraction.

Statistical analysis

Descriptive statistics of the measurements were calculated as the mean, standard deviation (SD), median, 25th and 75th percentiles (IQR), number, and percentage frequencies depending on the nature of the data. The conformity of numerical data to normal distribution was evaluated using the Shapiro-Wilk test, and it was determined that the data were not normally distributed. Relationships between measurements were analyzed using Spearman's rank correlation analysis. A p-value, $p \leq 0.05$ was considered statistically significant, and all calculations were performed using SPSS software (version 23).

RESULTS

The mean values of the 329 participants (188 female, 141 male) were as follows: age, 60.61 ± 11.35 years; height, 161.15 ± 8.95 cm; weight, 79.41 ± 13.88 kg; WC, 95.73 ± 12.35 cm; BMI, 30.74 ± 5.81 kg/m², and ABSI, 0.081 ± 0.056. Descriptive statistics of the participants' numerical characteristics are presented in Table 1.

The descriptive values for the categorical characteristics of the participants are presented in Table 2.

The correlations between the measurements are presented in Table 3. A statistically significant but weak negative correlation was observed between ABSI and heart rate (r = -0.124). In addition, a statistically significant moderate positive correlation was found between ABSI and risk level (r = 0.457). In contrast, no significant associations were detected between ABSI and g-MPS-derived volumetric or functional parameters.

A weak negative correlation was identified between risk level and heart rate (r = -0.121), whereas a weak positive correlation was observed between risk level and duration (r = 0.120). No significant relationship was detected between risk level and other g-MPS parameters.

When the relationships between g-MPS findings and BMI were examined, weak positive correlations were found with EF (r = 0.124) and heart rate (r = 0.155), while moderate negative correlations were observed with METS (r = -0.301) and duration (r = -0.284). In

Table 1. Descriptive statistics of participants' numerical characteristics

	N	Mean	SD	Min	Max	Percentiles		
						25	Median	75
Age	329	60.61	11.35	25.00	85.00	52.50	62.00	69.00
EF	328	67.33	11.82	21.00	98.00	60.00	68.00	75.00
EDV	328	69.24	24.83	18.00	192.00	51.00	66.00	82.00
ESV	328	24.87	17.09	1.00	131.00	13.25	21.00	32.00
Heart Rate	329	84.25	5.53	68.00	110.00	81.00	83.00	86.00
METS	329	7.75	2.50	1.18	14.79	5.17	6.87	9.54
Duration	329	4.72	2.25	1.00	11.45	3.01	4.44	6.36
Height	329	161.15	8.95	130.00	183.00	155.00	161.00	168.00
Weight	329	79.41	13.88	38.00	118.00	70.50	79.00	87.00
BMI	329	30.74	5.81	15.82	51.37	26.77	29.91	33.92
WC	329	95.73	12.35	60.00	130.00	88.50	96.00	104.00
ABSI	329	0.081	0.056	0.044	0.830	0.073	0.078	0.081

ABSI: a body shape index, BMI: body mass index, EDV: end-diastolic volume, EF: ejection fraction, ESV: end-systolic volume, METS: metabolic equivalents of task, WC: waist circumference, SD: standard deviation, Min: minimum, Max: maximum.

Table 2. Descriptive values for the categorical characteristics of the participants

Categorical characteristics		N	%
Gender	Female	188	57.1
	Male	141	42.9
Cholesterol	No	226	68.7
	Yes	103	31.3
Smoking	No	257	78.1
	Yes	72	21.9
Family History	No	154	46.8
	Yes	175	53.2
Hypertension	No	132	40.1
	Yes	197	59.9
Risk Level	Very low	193	58.7
	Low	65	19.8
	Average	39	11.9
	High	9	2.7
	Very high	23	7.0

the analysis of g-MPS findings in relation to WC, weak to moderate positive correlations were identified with EDV (r = 0.183) and ESV (r = 0.109), whereas weak negative correlations were found with METS (r = -0.205) and duration (r = -0.144). Other correlations not described in detail are presented in Table 3.

The strong positive correlation between BMI and WC (r = 0.730) indicates a close association between these two measures in relation to abdominal adiposity. A statistically significant but weak negative correlation was observed between ABSI and heart rate, indicating an association between these parameters. Moderate and weak negative correlations were observed between METS and BMI (r = -0.301) and WC (r = -0.205), respectively. A weak negative correlation was also present between risk level and heart rate (r = -0.121).

DISCUSSION

In this study, the relationship between g-MPS parameters and ABSI, an indicator of abdominal obesity, was investigated in individuals with normal myocardial perfusion imaging findings. The results provide insight into the associations between anthropometric indices and cardiac physiological parameters in a cardiovascularly normal population. Previous studies have reported that increased ABSI values are associated with coronary artery disease and cardiovascular risk. However, as all participants included in the present study had completely normal g-MPS findings, our results do not indicate the presence of coronary artery disease or an increased CAD risk. Instead, the observed associations reflect physiological or subclinical relationships rather than evidence of overt disease. In this context, our findings are in line with the existing literature addressing obesity-related cardiovascular risk factors, while emphasizing that such associations may also be observed in the absence of manifest cardiovascular disease (18-21)

Although BMI is widely used in the assessment of obesity, it has important limitations in accurately reflecting body composition, as it does not distinguish between fat and muscle components (22-24).

Obesity is not only related to body weight but also to fat distribution. Krakauer et al. reported that, because the waist circumference component in the ABSI formula reflects abdominal fat accumulation, ABSI is a more effective indicator for predicting mortality risk independently of BMI (13). Furthermore, studies have indicated that the use of alternative anthropometric measures, such as ABSI, as an alternative to BMI, is one of the factors that enhances the reliability of cardiovascular disease risk assessment (25,26).

In a study evaluating the performance of the A Body Shape Index (ABSI) in predicting hypertension, cardiovascular disease, type 2 diabetes, and all-cause mortality, ABSI demonstrated superior performance in predicting all-cause mortality compared with BMI and WC (10).

Table 3. Correlations between numerical measurements

		r	P	N	95% Confidence Interval [Lower; Upper]
Age	BMI	0.063	0.257	329	[-0.045 ; 0.170]
	WC	**0.210**	**<0.001**	**329**	[0.104 ; 0.311]
	ABSI	**0.332**	**<0.001**	**329**	[0.233 ; 0.424]
	Risk Level	0.015	0.792	329	[-0.093 ; 0.123]
	EF	0.063	0.257	328	[-0.045 ; 0.170]
	EDV	**-0.124**	**0.025**	**328**	[-0.229 ; -0.016]
	ESV	-0.102	0.065	328	[-0.208 ; 0.006]
	Heart Rate	**0.232**	**<0.001**	**329**	[0.127 ; 0.332]
	METS	**-0.478**	**<0.001**	**329**	[-0.557 ; -0.390]
	Duration	**-0.441**	**<0.001**	**329**	[-0.524 ; -0.350]
Height	WC	-0.053	0.335	329	[-0.160 ; 0.055]
	ABSI	**0.227**	**<0.001**	**329**	[0.122 ; 0.327]
	Risk Level	0.046	0.410	329	[-0.062 ; 0.153]
	EF	**-0.330**	**<0.001**	**328**	[-0.422 ; -0.231]
	EDV	**0.427**	**<0.001**	**328**	[0.334 ; 0.511]
	ESV	**0.411**	**<0.001**	**328**	[0.317 ; 0.497]
	Heart Rate	**-0.179**	**0.001**	**329**	[-0.282 ; -0.072]
	METS	**0.258**	**<0.001**	**329**	[0.154 ; 0.356]
	Duration	**0.312**	**<0.001**	**329**	[0.211 ; 0.406]
Weight	WC	0.727	**<0.001**	329	[0.672 ; 0.774]
	ABSI	-0.098	0.076	329	[-0.204 ; 0.010]
	Risk Level	-0.086	0.120	329	[-0.193 ; 0.022]
	EF	-0.056	0.311	328	[-0.163 ; 0.052]
	EDV	**0.297**	**<0.001**	**328**	[0.195 ; 0.392]
	ESV	**0.193**	**<0.001**	**328**	[0.087 ; 0.294]
	Heart Rate	0.044	0.423	329	[-0.064 ; 0.151]
	METS	**-0.164**	**0.003**	**329**	[-0.268 ; -0.056]
	Duration	**-0.110**	**0.050**	**329**	[-0.215 ; -0.002]
BMI	WC	0.730	<0.001	329	[0.675 ; 0.777]
	ABSI	**-0.208**	**<0.001**	**329**	[-0.309 ; -0.102]
	Risk Level	-0.090	0.102	329	[-0.196 ; 0.018]
	EF	**0.124**	**0.025**	**328**	[0.016 ; 0.229]

ABSI: a body shape index, BMI: body mass index, CI: confidence interval, Duration: time to reach the target heart rate, EDV: end-diastolic volume, EF: ejection fraction, ESV: end-systolic volume, Heart Rate: percentage of achieved target heart rate, METS: metabolic equivalents of task, N: number of participants, P: probability value, r: correlation coefficient, WC: waist circumference.

Table 3. Continued

		r	P	N	95% Confidence Interval [Lower; Upper]
	EDV	0.026	0.645	328	[-0.082 ; 0.134]
	ESV	-0.049	0.374	328	[-0.156 ; 0.059]
	Heart Rate	**0.155**	**0.005**	**329**	[0.048 ; 0.259]
	METS	**-0.301**	**<0.001**	**329**	[-0.404 ; -0.209]
	Duration	**-0.284**	**<0.001**	**329**	[-0.375 ; -0.176]
WC	ABSI	**0.410**	**<0.001**	**329**	[-0.677 ; -0.539]
	Risk Level	**0.342**	**<0.001**	**329**	[-0.274 ; -0.063]
	EF	-0.001	0.988	328	[0.072 ; 0.282]
	EDV	**0.183**	**0.001**	**328**	[-0.154 ; 0.063]
	ESV	**0.109**	**0.048**	**328**	[-0.217 ; -0.003]
	Heart Rate	0.061	0.267	329	[0.070 ; 0.280]
	METS	**-0.205**	**<0.001**	**329**	[-0.393 ; -0.194]
	Duration	**-0.144**	**0.009**	**329**	[-0.351 ; -0.147]
ABSI	Risk Level	**0.457**	**<0.001**	**329**	[0.368 ; 0.538]
	EF	-0.083	0.135	328	[-0.264 ; -0.053]
	EDV	0.079	0.154	328	[-0.101 ; 0.115]
	ESV	0.103	0.062	328	[-0.040 ; 0.175]
	Heart Rate	**-0.124**	**0.025**	**329**	[-0.099 ; 0.117]
	METS	0.017	0.766	329	[-0.220 ; -0.006]
	Duration	0.082	0.137	329	[-0.224 ; -0.010]
Risk Level	EF	0.016	0.778	328	[-0.087 ; 0.129]
	EDV	-0.001	0.991	328	[-0.048 ; 0.167]
	ESV	-0.005	0.923	328	[-0.060 ; 0.155]
	Heart Rate	**-0.121**	**0.029**	**329**	[-0.107 ; 0.109]
	METS	0.091	0.099	329	[-0.239 ; -0.026]
	Duration	**0.120**	**0.029**	**329**	[-0.243 ; -0.030]
EF	EDV	**-0.628**	**<0.001**	**328**	[-0.458 ; -0.274]
	ESV	**-0.884**	**<0.001**	**328**	[-0.677 ; -0.539]
	Heart Rate	0.047	0.399	328	[-0.052 ; 0.164]
	METS	**-0.178**	**0.001**	**328**	[-0.229 ; -0.016]
	Duration	**-0.243**	**<0.001**	**328**	[-0.227 ; -0.014]
EDV	ESV	**0.866**	**<0.001**	**328**	[0.952 ; 0.969]

ABSI: a body shape index, BMI: body mass index, CI: confidence interval, Duration: time to reach the target heart rate, EDV: end-diastolic volume, EF: ejection fraction, ESV: end-systolic volume, Heart Rate: percentage of achieved target heart rate, METS: metabolic equivalents of task, N: number of participants, P: probability value, r: correlation coefficient, WC: waist circumference.

Table 3. Continued

		r	P	N	95% Confidence Interval [Lower; Upper]
	Heart Rate	**-0.165**	**0.003**	**328**	[-0.233 ; -0.020]
	METS	**0.261**	**<0.001**	**328**	[0.100 ; 0.309]
	Duration	**0.312**	**<0.001**	**328**	[0.117 ; 0.324]
ESV	Heart Rate	**-0.141**	**0.011**	**328**	[-0.248 ; -0.036]
	METS	**0.250**	**<0.001**	**328**	[0.104 ; 0.313]
	Duration	**0.309**	**<0.001**	**328**	[0.124 ; 0.331]
Heart Rate	METS	**-0.444**	**<0.001**	**329**	[-0.265 ; -0.054]
	Duration	**-0.446**	**<0.001**	**329**	[-0.250 ; -0.039]
METS	Duration	**0.886**	**<0.001**	**329**	[0.955 ; 0.971]

ABSI: a body shape index, BMI: body mass index, CI: confidence interval, Duration: time to reach the target heart rate, EDV: end-diastolic volume, EF: ejection fraction, ESV: end-systolic volume, Heart Rate: percentage of achieved target heart rate, METS: metabolic equivalents of task, N: number of participants, P: probability value, r: correlation coefficient, WC: waist circumference.

Hung et al. investigated the role of abdominal obesity and circulating adipokines in predicting myocardial ischemia and found results supporting the impact of abdominal obesity on cardiovascular health. These findings highlight associations between abdominal fat accumulation and cardiovascular health reported in previous studies (4). Abdominal obesity has been associated with various health conditions, including heart disease, hypertension, and diabetes, in previous studies (27). In this study, the negative association observed between ABSI and heart rate in cardiovascularly healthy individuals suggests that abdominal fat distribution may be associated with cardiovascular physiological responses. Our findings are consistent with previous studies investigating the relationship between abdominal obesity and cardiovascular parameters (28). Given the associations reported between obesity-related measurements and cardiovascular parameters, the relationship between heart rate, body composition, and metabolism is a critical factor that should be considered in the treatment of obesity (29). According to the g-MPS findings, the positive correlations observed between EDV and ESV and waist circumference suggest that abdominal adiposity may be associated with left ventricular volume parameters. This relationship indicates that increased abdominal fat distribution may be related to early cardiac physiological changes in cardiovascularly healthy individuals and is consistent with previous studies reporting associations between waist circumference, visceral adiposity, cardiovascular risk factors, and cardiac parameters (29-32). Additionally, the significant negative correlation observed between waist circumference and heart rate suggests that abdominal fat distribution may be associated with cardiac physiological regulation. Chartrand et al. investigated the effects of visceral fat on cardiac health and reported associations between abdominal obesity and cardiovascular risk profiles in previous studies. Taken together, these findings indicate that waist circumference is an important anthropometric measure for assessing abdominal obesity and its association with cardiovascular parameters (6). There are significant differences between men and women regarding the effects of obesity on the body. The global prevalence of obesity in women is higher than in men (18). From a women's health perspective, obesity can lead to hormonal imbalances, insulin resistance, and an increased risk of metabolic syndrome (33). Exceeding the accepted waist circumference threshold values has been associated with an unfavorable cardiovascular risk profile, and waist circumference has been identified as an important anthropometric indicator for the assessment of abdominal adiposity (34). Women generally have a higher proportion of adipose tissue than men, with fat more commonly distributed in the lower extremities, a pattern that has been suggested to be relatively protective in terms of cardiometabolic

risk. Additionally, estrogen has been suggested to play a protective role against cardiovascular diseases in women (35).

But hormonal changes occurring after menopause may promote a shift toward abdominal fat accumulation in women, potentially increasing cardiometabolic risk. These observations highlight the importance of considering sex-specific fat distribution patterns, rather than BMI alone, when evaluating cardiometabolic risk (36-38).

In men, fat tissue typically accumulates in the abdominal area, which is a significant factor that increases the risk of heart disease. Therefore, abdominal obesity has been associated with a higher cardiovascular disease risk in men in previous studies (39).

Overall, this study demonstrated that anthropometric measures such as ABSI, BMI, and waist circumference exhibit distinct patterns of association with cardiovascular physiological parameters in individuals with normal g-MPS findings. These findings suggest that measures reflecting abdominal fat distribution may be associated with physiological variations within a cardiovascularly normal population. However, the study design and the inclusion of only individuals with normal g-MPS findings limit the ability to draw causal inferences from the observed associations.

CONCLUSION

In this study, the relationships between ABSI, conventional anthropometric measures, and gated myocardial perfusion SPECT parameters were evaluated in individuals with normal myocardial perfusion findings. The results suggest that ABSI, as a complementary index to traditional anthropometric measures, may contribute to the assessment of relationships between abdominal fat distribution and cardiovascular physiological characteristics. The use of ABSI in a clinically normal population may help provide a more comprehensive evaluation of body shape–related cardiovascular features.

Ethical approval

This study has been approved by the Bolu Abant Izzet Baysal University Clinical Research Ethics Committee (approval date 11/04/2023, number 2023/100). Written informed consent was obtained from the participants.

Author contribution

Concept: SSM, BiC, HanA; Design: SSM, BiC, HamA; Data Collection or Processing: SSM, BiC, HanA, BeC; Analysis or Interpretation: HanA; Literature Search: SSM, BiC, HamA, HanA, BeC; Writing: SSM, BiC, HamA, HanA, BeC. All authors reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

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