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Sex and Age Differences in Body-Image, Self-Esteem, and Body Mass Index in Adolescents and Adults After Single-Ventricle Palliation

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Abstract

Single-ventricle congenital heart disease (SVCHD) requires multiple palliative surgical procedures that leave visible surgical scars and physical deficits, which can alter body-image and self-esteem. This study aimed to compare sex and age differences in body-image, self-esteem, and body mass index (BMI) in adolescents and adults with SVCHD after surgical palliation with those of a healthy control group. Using a comparative, cross-sectional design, 54 adolescent and adult (26 male and 28 female) patients, age 15–50 years, with SVCHD were compared with 66 age-matched healthy controls. Body-image and self-esteem were measured using the Multidimensional Body-Self Relations Questionnaire–Appearance Scale and Rosenberg Self-Esteem Scale. Height and weight were collected from retrospective chart review, and BMI was calculated. Female adolescents and adult patients with SVCHD reported lower body image compared with males patients with SVCHD and healthy controls ($p = 0.003$). Specific areas of concern were face ($p = 0.002$), upper torso or chest ($p = 0.002$), and muscle tone ($p = 0.001$). Patients with SVCHD who were <21 years of age had lower body image compared with healthy controls ($p = 0.006$). Self-esteem was comparable for both patients with SVCHD and healthy peers. There were no sex differences in BMI; BMI was higher in subjects >21 years of age ($p = 0.01$). Despite the similarities observed in self-esteem between the two groups, female patients with SVCHD <21 years of age reported lower perceived body-image. Our findings support the need to recognize poor psychological adjustment related to low self-esteem in patients with SVCHD; female patients

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warrant increased scrutiny. Strategies to help patients with SVCHD cope with nonmodifiable aspects of body-image during the difficult adolescent–to–young adult years may potentially enhance self-esteem and decrease psychological distress.

Keywords

Body-image; Self-esteem; Body mass index; Single-ventricle congenital heart disease

Introduction

Children with complex single-ventricle congenital heart disease (SVCHD) are surviving surgical palliation and transitioning to adulthood [13, 24]. Despite improved life expectancy, many patients with SVCHD have residua or sequelae from multiple palliative surgical procedures or from the natural disease course [16]. The culmination of these surgical procedures results in thoracotomy and/or sternotomy scars, possible pacemaker-insertion scars, chest wall deformities, residual cyanosis, and impaired physical functioning, which are visible reminders of their heart condition. In addition, some SVCHD patients may also be smaller in stature [6] and have dysmorphic facial features from a genetic syndrome associated with their heart defect. Psychosocial adjustment related to their outward appearance can be a challenge in this population. Furthermore, deficits in physical functioning may contribute to increased weight or body mass index (BMI), which can alter one's perception of body-image and self-esteem.

Only a few studies have measured the construct of body-image in congenital heart disease (CHD) patients [8, 9]. In a qualitative study, investigators interviewed 13 young women with CHD; 5 expressed dissatisfaction with their size and shape [8]. In another study, the researchers found that psychological symptoms in male patients were strongly influenced by body-image perception, especially if they rejected their body as a result of disfigurement or a perceived deficiency [9]. Many adults with CHD were interviewed or surveyed about their experiences, attitudes, or impact of their surgical scar and reported feeling self-conscious or negative attitudes about their body and scars [7, 10–12]. However, no studies have been reported in patients with complex SVCHD that may result in more bodily disfigurement.

Self-esteem or similar constructs, such as self-concept or self-confidence, is often viewed as the way an individual thinks or feels about themselves (i.e., self-worth) [19]. Conflicting results have been reported regarding sex differences in self-esteem or self-concept in adolescent and adult patients with CHD [3, 4, 10, 11, 20, 22]. A few studies identified male CHD patients as having lower self-esteem than female CHD patients, which was partly explained by decreased physical ability or sports restrictions interfering with peer relationships [9, 20]. However, most studies identified lower-self-esteem in CHD patients compared with healthy controls [3, 4, 20]. To our knowledge, no studies have been conducted to explore sex and age differences related to body-image, self-esteem, and BMI in an older group of patients with complex SVCHD who have undergone complete surgical palliation with the Fontan procedure. The purpose of this study was to describe and compare age and sex differences in body image, self-esteem, and BMI in adolescents and adults who have undergone SVCHD surgical palliation with those of healthy counterparts.

Material and Methods

Sample and Setting

A convenience sample of 54 adolescent and adult Fontan patients, age 15–50 years, were recruited from the Ahmanson/UCLA Adult Congenital Heart Disease Clinic, the Children's

Hospital Los Angeles Cardiology Clinic, private cardiology practices, and CHD support groups to participate in this comparative, cross-sectional study. Institutional Review Board approval was obtained from all appropriate sites before study start-up.

Eligible adolescents and adults who underwent the Fontan procedure were identified and referred by the patient's cardiologist or nurse practitioner, or they directly responded to study advertisements. In addition, subjects entered the study in response to physician referral letters, clinic fliers, and support-group newsletter advertisements. Additional recruitment was sought through local CHD support group meetings. Eligibility was assessed by the investigator either over the telephone or in person. The inclusion criteria were as follows: (1) age ≥ 15 years; (2) English literacy; (3) single-ventricle diagnosis; and (4) previous Fontan completion. Exclusion criteria were as follows: (1) severe visual, cognitive, or psychiatric problems precluding informed consent and self-administered questionnaire completion; and (2) recent hospitalization or surgery (<3 months). All subjects gave their informed consent before inclusion in the study.

Sixty-six healthy adolescents and adults were recruited from local high schools, colleges, libraries, and malls. The healthy control group was matched by age (±2 years), sex, ethnicity, marital status, educational level, and geographic region. Exclusion criteria for healthy controls included the following: (1) cognitive or psychiatric problems precluding informed consent; (2) non–English literacy or visual impairment precluding completion of self-administered questionnaire packet; and (3) presence of any chronic illnesses or disabilities. Demographic characteristics of the healthy group did not differ from the Fontan group, indicating that it was a representative sample.

Data Collection

Once eligibility was determined, consent was obtained from patients ≥ 18 years of age. For patients >18 years of age, the parent(s) and adolescent were approached together, and both parental and adolescent assent were required for participation. Once written informed consent/assent were obtained, the participant's clinical information was collected by way of chart review by the investigator.

The questionnaire packet and a demographic intake form were given to participants during a clinic visit; they were given the option to complete and return the questionnaire to the investigator the same day or take it home to complete and send it back in a self-addressed, stamped envelope. Monetary compensation of $20.00 was provided for the subject's time and inconvenience.

Measurements

Multidimensional Body-Self Relations Questionnaire–Appearance Scale—The Multidimensional Body-Self Relations Questionnaire–Appearance Scale (MBSRQ-Appearance Scale [MBSRQ-AS]) is a well-established, 34-item measure of body-image that consists of 5 subscales: Appearance Evaluation (APP), Appearance Orientation (APO), Overweight Preoccupation (OWT), Self-Classified Weight (WTC), and the Body Areas Satisfaction Scale (BASS) [1]. APP assesses feelings of physical attractiveness or unattractiveness, with higher scores reflecting positive or satisfied feelings with appearance. APO assesses the extent of investment in one's appearance, with higher scores indicating placing importance on appearance or how they look. OWT assesses fat anxiety, weight vigilance, dieting, and eating restraint, with higher scores indicating a weight preoccupation. The APP, APO and OWT subscales are measures on a 5-point Likert scale ranging from 1 (definitely disagree) to 5 (definitely agree). WTC assesses how one perceives and labels one's weight on a 5-point Likert scale ranging from 1 (underweight) to 5 (overweight) [1].

The BASS assesses satisfaction with discrete aspects of one's appearance (i.e., face, hair, lower torso [hips, thighs, legs], mid-torso [stomach], upper torso [chest or breasts, shoulders, arms]) based on a 5-point Likert scale ranging from 1 (dissatisfied) to 5 (satisfied), with higher scores reflecting contentment content with most body areas [1]. The MBSRQ is intended for use with adolescents and adults (≥ 15 years) [1]. In this study, Cronbach's α was 0.79 for all 34 items. For the 5 subscales, APP, APO, OWT, WTC, and the BAS, Cronbach's α values were 0.85, 0.80, 0.79, 0.78, and 0.76, respectively.

Rosenberg Self-Esteem Scale—Self-esteem was measured using the Rosenberg Self-Esteem Scale (RSE) [19]. The RSE is a 10-item measure of positive and negative aspects of self-esteem. The responses were scored on a 4-point Likert scale ranging from 0 (strongly agree) to 3 (strongly disagree). The overall score was computed by summing the individual items scored for minimum and maximum scores of 0 and 30, respectively. The sum of the scores were classified according to level of self-esteem, with 15–25 considered normal and scores <15 considered low self-esteem. The instrument has been extensively used in various healthy and nonhealthy populations, and its reliability and validity has been supported for measuring self-esteem [19]. In the current study, the Cronbach's α value was 0.90.

BMI—BMI was used to assess underweight (BMI <18.5 kg/m^2), normal weight (BMI 18.5–24.9 kg/m^2), overweight (BMI 25–29.9 kg/m^2), and obese (BMI ≥ 30 kg/m^2). BMI measures body fat based on height and weight calculations: weight in kilograms divided by the square of height in meters (weight/height^2 (kg/m^2) [15]. The last clinic visit height and weight were obtained from retrospective chart review, and BMI was calculated. For patients 15–20 years of age, the Center for Disease Control BMI-for-age growth charts for female and male individuals were used to obtain percentiles [2]. Patients were placed in the recommended weight categories according to percentiles: underweight = <5th percentile; normal weight = 5th to <85th percentile; overweight = 85th to <95th percentile; and obese = ≥95th percentile) [2].

Statistical Analysis

Data was analyzed using SPSS for Windows (version 13.0; Chicago, IL). Descriptive statistics were used to present demographic, clinical data, and questionnaire means. Multivariate analysis was used to determine differences in body-image and self-esteem between sex and age compared with a healthy control group. Analysis of variance was used to determine age and sex differences in BMI in the Fontan group. A p value < 0.05 was considered statistically significant.

Results

Patient Characteristics

A total of 57 adolescent and adult Fontan patients were consented to participate; 54 completed all requirements for participation. Only one subject was excluded secondary to severe developmental delay. Demographic and clinical characteristics of the study sample are listed in Tables 1 and 2, respectively. Mean ages of the Fontan and the healthy participants were 26 ± 9 years and 25 ± 9 years, respectively. Demographic characteristics identified an even distribution of male and female subjects, and the majority were white (63%), single (73%), and employed or a full-time student (67%). Clinical characteristics identified that the majority had the diagnosis of tricuspid atresia or double-inlet left ventricle (59%), lateral tunnel Fontan-type (44%), oxygen saturations >90% (70%), normal BMI (59%), New York Heart Association (NYHA) class I (48%) and II to III (52%), had three or four heart surgeries (56%), and were >5 years from any surgical procedure (65%).

Sex and Age Differences in Body Image

Female adolescents and adults with SVCHD reported lower perceived body image or dissatisfaction with appearance compared with males with SVCHD and healthy controls ($p = 0.003$) (Table 3). Patients with SVCHD <21 years of age also had lower body image compared with healthy controls ($p = 0.006$) (Table 4). The BASS subscales of specific body areas identified face ($p = 0.002$ vs. $p = 0.003$), upper torso ($p = 0.002$ vs. $p = 0.005$), and muscle tone ($p = 0.001$ vs. $p = 0.003$) as significant body areas of dissatisfaction in female subjects and subjects <21 years of age, respectively (Tables 3, 4).

Sex and Age Differences in Self-Esteem and BMI

Tables 3, 4 and 5 list sex and age differences in self-esteem and BMI by group. There were no differences in self-esteem according to sex ($p = 0.15$) and age ($p = 0.3$) between patients with SVCHD and healthy peers. The average self-esteem scores were in the normal range (15–25) in both groups. Female self-esteem scores in the SVCHD and healthy group were similar. However, male scores were lower in the SVCHD group (21 ± 5.6) compared with healthy group (25 ± 5.8), but these changes were not statistically significant.

The majority of SVCHD survivors were classified as being underweight or normal weight (69%), with (21%) considered overweight or obese (Table 2). No sex differences were identified in BMI in the SVCHD group. However, patients >21 years of age had a higher BMI compared with patients >21 years of age, respectively (20.8 ± 2.8 vs. 23.8 ± 4.2; $p = 0.01$).

Discussion

Altered physical appearance can threaten various aspects of one's life, such as body-image and self-esteem. Our study findings indicate that female SVCHD patient <21 years of age reported lower perceived body-image compared with healthy peers. Specific body areas of concern were the face, upper torso/chest, and muscle tone. Our study findings of dissatisfaction in the upper torso/chest area could possibly be related to surgical scaring or chest wall deformities associated with multiple surgical re-entries. The majority of patients in this study have undergone three to four palliative heart surgeries (56%), >5 years ago (65%), requiring thoracotomy and/or median sternotomy incisions. Minimally invasive surgical techniques or low sternotomy incisions are not an option in the single-ventricle population secondary to multiple surgeries starting at a young age. Furthermore, 40% of the SVCHD patients had permanent epicardial pacemakers placed, which often requires additional subxyphoid or anterior thoracotomy incisions that can cause further disfigurement to the chest area. The qualitative literature in the general CHD population supports the feelings of being "disfigured" or "dissatisfied" with their surgical scars and the need to conceal or hide them from others [7, 10–12]. Although the patient's scar is a daily reminder of their heart condition, some have perceived their scars in a positive light as an appreciation of health [11].

Facial features or complexion and muscle tone were also identified as other areas of dissatisfaction with body-image. Residual cyanosis can produce an altered complexion secondary to lower oxygen saturation levels in patients with SVCHD. This bluish appearance to the skin and nail beds is often more easily disguised in female patients with the use of makeup, lipstick, and nail polish [9]. In our study, 31% of the participants in SVCHD group had oxygen saturation levels <90%, and 33% had undergone fenestrated Fontan procedures, which could potentially explain these results.

Decreased muscle tone could be associated with limited daily activity and exercise capacity [14], long-term Fontan physiology, or cardiac cachexia related to the failing single ventricle

[16]. Poor weight gain has been well described before the Glenn shunt procedure when the heart is volume-overloaded in single-ventricle patients [4]. Cohen et al. [5] and Vogt et al. [23] reported some improvement in mean weight for z-scores after Glenn and Fontan procedures. However, the weights never normalized after completion of staged palliation. A study on anthropometric measures in a large cohort of younger Fontan patients (mean age 11.9 ± 3.4 years) identified 92% as having a BMI-z score in the middle to lower range [6]. The normal or lower BMI in this study cohort could be attributed to the lack of significance identified in the weight subscales of body-image.

Altered body-image is often associated with a negative impact on self-esteem or self-confidence. An interesting finding is this study was that despite overall dissatisfaction with appearance, self-esteem was considered to be normal in both the SVCHD and healthy control groups. Male and female subjects' SVCHD scores were similar; there were no sex or age group differences. Our results contradict previous reports of primarily male or female sex having lower self-esteem [3, 11, 22] and patients with more severe disease having lower self-esteem [4]. The mean age of this study cohort was 26 ± 9 years (range 15–50 years), which, to our knowledge, is the oldest group of SVCHD patients reported. One may presume that acceptance of one's self despite imperfections may develop over time with maturity in both male and female patients. Patients with SVCHD must learn to cope or adapt to their heart disease at a young age. The sense of surviving or mastery of living with a chronic illness could instill positive feelings of self-worth and enhance self-esteem despite dissatisfaction with body image. Improvement in self-esteem has also been reported in children and adolescents after surgical correction [23]. The completion of staged palliation in this study sample may reflect our finding of favorable self-esteem. In addition, the adolescent or young adult's perception of family support and peer acceptance is considered important in the development of positive self-esteem. In this same study cohort, we identified family social support as being a positive predictor of quality of life in SVCHD patients [17]. Positive family social support could be one component in building self-esteem in patients with complex SVCHD despite negative thinking about their appearance.

Previous studies have shown that the obesity epidemic has not had a significant impact in the SVCHD group compared with those having other CHDs [18]. However, 21% of the patients with SVCHD in our sample were overweight or obese. Overweight or obesity in CHD is often attributed to provider recommended activity restrictions and/or sedentary lifestyles that are either parental or self-imposed [21]. Previous reports have suggested that increased adiposity is associated with the risk of increased afterload, ventricular hypertrophy, and poor exercise performance in obese children after the Fontan procedure [6]. The possibility of single-ventricle patients developing heart failure with increasing BMI is worrisome in this at-risk population and warrants close follow-up and preventative dialog by care providers.

Limitations

The results of this study should be viewed in light of some limitations. The study sample may be healthier than normal secondary to selection bias (i.e., currently seeking medical follow-up, agree to participate, speak English, and met inclusion/exclusion criteria) and may not be generalizable to the entire Fontan population. BMI was retrospectively collected from the last clinic visit and may not reflect current status; furthermore, BMI was not collected from the control group, which could have provided insight into comparisons with the general population. The sample size was small but comparable with those in previous studies in SVCHD. Last, this was a comparative, cross-sectional design; medical history data were collected from retrospective chart review; and questionnaire data were crosssectional.

Conclusion

Female SVCHD patients <21 years of age reported lower perceived body-image despite self-esteem comparable with healthy peers. Specific body areas of concern were upper torso/chest, face, and muscle tone. However, some of the body areas deemed “dissatisfied” are potentially non-modifiable. Psychosocial adjustment can be challenging, particularly in the female adolescent or young adult. Weight was not a significant factor in body-image perceptions because this SVCHD group was predominately of normal weight. BMI increased with advanced age and is a concern in this at-risk single-ventricle population. Self-imposed exercise restrictions and sedentary lifestyle may be a disadvantage to long-term outcomes in adolescents and adults with SVCHD. Thus, the development of structured exercise programs for weight control and muscle tone in patients with SVCHD may potentially improve long-term health outcomes and thus warrant further investigation.

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Table 1

Demographic characteristics between the SVCHD and healthy group

Characteristics	SVCHD (*N* = 54)	Healthy (*N* = 66)	*p**
Age (y)	25.6 ± 9	24.5±9.2	.505
≤21	22 (41)	36 (54)	
>21	32 (59)	30 (46)	
Sex			.340
Male	26 (48)	26 (39)	
Female	28 (52)	40 (61)	
Race			.371
White	34 (63)	41 (62)	
Hispanic	11 (20)	11 (16)	
Marital status			.210
Unmarried	40 (70)	52 (79)	
Married or cohabiting	14 (30)	14 (21)	
Education			.555
≤High school	21 (39)	29 (44)	
≤College	28 (52)	29 (44)	
Beyond college	5 (9)	8 (12)	
Employment status			.446
Employed	35 (67)	39 (59)	
Unemployed or student	19 (33)	27 (41)	

Data are presented as *n* (%) or mean ± SD

* $p > 0.05$ identifies no group difference indicating a representative sample

Table 2

Clinical characteristics of the SVCHD group ($N = 54$)

Characteristics	*n* (%)
Single-ventricle diagnosis	
TA	19 (35)
DILV	13 (24)
Hypoplastic RV	8 (15)
HLHS/variants	4 (7)
DORV	3 (6)
AVC	2 (4)
Ebsteins	1 (2)
Other complex anatomy	4 (7)
Fontan type	
Classic RA to PA	15 (28)
Bjork RA to RV	2 (4)
Lateral tunnel	24 (44)
Extracardiac Fontan	13 (24)
Fontan fenestration	
Yes	18 (33)
No. of surgeries	
1–2	18 (33)
3–4	30 (56)
5	6 (11)
Time from last surgery (years)	
<5	19 (35)
≥5	35 (65)
NYHA classification	
I	26 (48)
II	17 (32)
III	11 (20)
Pacemaker	
Yes	22 (41)
Oxygen saturation	
≤90	17 (31)
>90	37 (69)
BMI	
Underweight	5 (10)
Normal weight	31 (57)
Overweight	9 (17)
Obese	2 (4)

RV right ventricle, *RA* right atrium, *HLHS* hypoplastic left heart syndrome, *PA* pulmonary artery, *TA* tricuspid artresia, *DILV* double-inlet left ventricle, *AVC* atrioventricular canal

Table 3

Sex differences in body-image and self-esteem by group

Variable	SVCHD (*n* = 54)		Healthy (*n* = 66)		*F*	*p*
	Male (*n* = 26)	Female (*n* = 28)	Male (*n* = 26)	Female (*n* = 40)		
MBSRQ-AS						
APP	3.3 ± 0.6	3.1 ± 0.6	3.7 ± 0.6	3.5 ± 0.6	9.412	**0.003**
APO	3.1 ± 0.7	3.5 ± 0.6	3.2 ± 0.7	3.3 ± 0.7	0.061	0.805
OWT	1.8 ± 0.9	2.7 ± 1.2	2.4 ± 0.8	2.7 ± 1.0	1.755	0.188
WTC	3.0 ± 0.6	3.0 ± 0.8	3.2 ± 0.5	3.1 ± 0.6	1.340	0.249
BASS	3.4 ± 0.6	3.2 ± 0.5	3.7 ± 0.5	3.5 ± 0.6	5.790	**0.018**
BASS						
Face	3.6 ± 0.7	3.1 ± 1.3	4.0 ± 0.7	3.8 ± 0.9	9.625	**0.002**
Hair	3.8 ± 0.8	4.1 ± 0.8	3.5 ± 1.1	3.8 ± 1.3	2.428	0.122
Upper torso	3.1 ± 0.9	2.8 ± 1.1	3.7 ± 0.9	3.5 ± 1.2	9.579	**0.002**
Mid-torso	3.1 ± 1.0	2.3 ± 1.1	3.3 ± 1.0	2.6 ± 1.0	2.183	0.142
Lower torso	3.7 ± 0.8	3.4 ± 0.9	3.9 ± 0.9	3.4 ± 1.0	0.032	0.858
Muscle tone	3.1 ± 0.9	3.0 ± 0.9	3.7 ± 0.9	3.5 ± 0.8	11.845	**0.001**
Weight	3.2 ± 1.2	2.8 ± 1.2	3.5 ± 0.9	3.3 ± 1.0	3.376	0.069
Height	3.2 ± 1.3	3.8 ± 0.9	3.5 ± 1.1	3.8 ± 0.9	0.499	0.481
Overall	3.9 ± 0.7	3.5 ± 0.8	3.8 ± 0.7	3.8 ± 0.7	0.435	0.511
RES	21 ± 5.6	22 ± 5.3	25 ± 5.8	22 ± 7	2.157	0.145

Data presented as mean ± SD unless indicated otherwise

Bold values indicate statistically significant to $p \leq 0.05$

Table 4

Age differences in body-image and self-esteem by group

Variable	SVCHD (*n* = 54)		Healthy (*n* = 66)		*F*	*p*
	≤21 (*n* = 22)	>21 (*n* = 32)	≤21 (*n* = 30)	>21 (*n* = 36)		
MBSRQ-AS						
APP	3.1 ± 0.6	3.2 ± 0.6	3.4 ± 0.7	3.6 ± 0.6	7.731	**0.006**
APO	3.2 ± 0.8	3.5 ± 0.6	3.2 ± 0.7	3.4 ± 0.6	0.002	0.965
OWT	1.8 ± 1.0	2.6 ± 1.1	2.3 ± 1.0	2.8 ± 0.9	2.753	0.100
WTC	2.7 ± 0.6	3.2 ± 0.7	3.0 ± 0.5	3.3 ± 0.5	1.893	0.172
BASS	3.5 ± 0.6	3.1 ± 0.5	3.6 ± 0.7	3.5 ± 0.5	4.012	**0.048**
BASS						
Face	3.1 ± 1.1	3.4 ± 1.0	3.7 ± 1.0	4.1 ± 0.7	9.496	**0.003**
Hair	4.3 ± 0.6	3.7 ± 0.8	3.7 ± 1.1	3.6 ± 1.3	2.860	0.093
Upper torso	3.1 ± 1.1	3.1 ± 0.9	3.5 ± 1.3	3.6 ± 0.8	8.007	**0.005**
Mid-torso	3.1 ± 1.1	2.3 ± 1.1	3.0 ± 1.2	2.8 ± 1.0	0.737	0.392
Lower torso	3.8 ± 0.7	3.4 ± 0.9	3.5 ± 1.2	3.6 ± 0.9	0.071	0.791
Muscle tone	3.5 ± 0.9	2.7 ± 0.8	3.5 ± 0.8	3.6 ± 0.8	9.126	**0.003**
Weight	3.2 ± 1.3	2.9 ± 1.2	3.4 ± 1.0	3.4 ± 0.9	2.650	0.106
Height	3.5 ± 1.3	3.5 ± 1.1	4.0 ± 0.8	3.4 ± 1.1	0.793	0.375
Overall	3.9 ± 0.7	3.6 ± 0.7	3.7 ± 0.7	3.9 ± 0.7	0.146	0.703
RES	22.0 ± 5.8	21.3 ± 5.8	21.2 ± 7.2	24.4 ± 6.0	1.073	0.302

Data presented as mean ± SD unless indicated otherwise

Bold values indicate statistically significant to $p \leq 0.05$

Table 5

Sex and age differences in BMI for SVCHD group

Variable	Sex		*p*	Age		*p*
	Male	**Female**		**≥21**	**>21**	
BMI (mean ± SDs)	22.4 ± 3.8	22.7 ± 4	0.815	20.8 ± 2.8	23.8 ± 4.2	**0.01**
	(*n*)	(*n*)		(*n*)	(*n*)	
Underweight	2	3		3	2	
Normal	16	15		15	16	
Overweight	5	4		2	7	
Obese	1	1		0	2	

Bold values indicate statistically significant to ≤0.05 level

Mean ± SD as indicated for BMI or *n* = number of subjects