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Prevalence of Type D personality in obese adolescents and associated cardiovascular risk

Bruyndonckx L. (1,2) , Marchau F.(1), Verhulst S.(1,2), De Guchtenaere A.(3), Vrints C.(4), Denollet J.(4,5)
Department of Paediatrics, Antwerp University Hospital, Belgium (1); Laboratory of Experimental Medicine and Paediatrics, University of Antwerp, Belgium (2); Zeepreventorium, De Haan Belgium (3); Department of Cardiology, Antwerp University Hospital, Belgium (4); CoRPS – Center of research on Psychology in Somatic diseases, Tilburg University, The Netherlands (5)

Introduction. Type D personality refers to the joint tendency to experience negative emotions (negative affectivity) and to inhibit self-expression in social interaction (social inhibition. Type D has been associated with increased cardiovascular risk at adult age, as well as increased levels of depression and anxiety, and more unhealthy behaviours such as a sedentary lifestyle. Little is known about Type D personality and cardiovascular risk at adolescent age. Obese adolescents already display increased cardiovascular risk, including vascular stiffness, endothelial dysfunction, and reduced levels of endothelial progenitor cells (EPC) and endothelial microparticles (EMP). We examined whether Type D personality also contributes to cardiovascular risk among severely obese adolescents.
Methods. Fasting blood samples were taken from obese and healthy children. Peripheral arterial tonometry was used to measure endothelial function. EMP (CD31+/CD42b- particles) and EPC (CD34+/KDR+/CD45dim/- cells) were quantified using flow cytometry. Established psychological questionnaires were filled in by the participants.
Results. Obese and normal weight adolescents were comparable for age and sex distribution. Obese adolescents demonstrated worse cardiovascular risk profile with lower HDL concentration, higher CRP, higher systolic blood pressure and pulse wave velocity, endothelial dysfunction, lower EPCs and more EMPs (Table) Type D personality was more prevalent in obese adolescents than in normal weight adolescents (38% vs. 17% p= .04), as well as symptoms of depression (43% vs. 10% p= .002). In obese adolescents, a significant positive correlation was found between negative affectivity and vascular stiffness (r= 0.28; p= .04), and a negative correlation between social inhibition and numbers of EPC (r=-.39; p= 0.04). The correlation between social inhibition and reduced EPC numbers was independent of BMI; i.e., social inhibition correlated with a lower BMI (r= -.27; p=.04). Depressive symptoms were not associated with vascular stiffness or EPCs in obese adolescents, and these correlations were not present in normal weight adolescents.
Conclusions. Characteristics of Type D personality are more prevalent in obese adolescents than in their normal weight counterparts. In addition, social inhibition and negative affectivity are associated with cardiovascular risk factors, even at very young age.

	Normal Weight Children (n=30)	Obese Children (n=57)	p value
Female/Male (n)	21/9	42/15	0.715
Age (years)	15.4 ± 1.5	15.2 ± 1.4	0.585
Type D personality (%)	17%	38%	0.040
Depressive symptoms	10%	43%	0.002
BMI (kg/m²)	19.17 (17.58; 20.65)	35.21 (32.05; 38.94)	<0.001
Laboratory parameters			
HDL Cholesterol (mg/dl)	56.9 (49.8; 65.2)	42.0 (36.0; 49.0)	<0.001
LDL Cholesterol (mg/dl)	78.1 (69.4; 88.1)	83.1 (73.7; 100.1)	0.127
hsCRP (mg/dl)	0.04 (0.02; 0.11)	0.24 (0.15; 0.50)	<0.001
Vascular parameters			
Systolic BP (mm Hg)	111 ± 8	120 ± 10	<0.001
Diastolic BP (mm Hg)	64 ± 5	64 ± 7	0.956
PWV (m/s)	5.2 (4.9; 5.7)	5.9 (5.4; 6.7)	<0.001
Peak Response (AU)	2.15 (1.37; 2.97)	1.50 (1.24; 1.95)	0.005
EPC (#/10^6 MNC)	27.1 (22.0; 42.9)	16.8 (12.3; 25.2)	0.001
EMP (#/µl)	215.7 (149.6; 255.6)	269.0 (195.3; 350.0)	0.005

Table 1