Serum Endocan as a marker of endothelial dysfunction in patients with Turner Syndrome and its correlation with known vascular biomarkers

Ali Genco Gençay[1], Serra Karaca[2], Kemal Nişli[3], Aslı Derya Kardelen [4]
Şükran Poyrazoğlu [4], Firdevs Baş [4], Feyza Darendeliler[4]
Istanbul University, Faculty of Medicine, Department of Pediatrics, Istanbul, Turkey[1]
Samsun Hospital for Women and Children, Samsun,Turkey[2]
Istanbul University, Faculty of Medicine, Department of Pediatric Cardiology, Istanbul, Turkey[3]
Istanbul University, Faculty of Medicine, Department of Pediatric Endocrinology, İstanbul, Turkey[4]

BACKGROUND and AIM

Turner Syndrome, (TS), the result of complete or partial deficiency of an X chromosome, is charaterized by short stature, dysmorphism and hypogonadism. Early mortality and morbidity in TS is a result of acquired cardiovascular disease, caused by atherosclerosis. The precursor of atherosclerosis is endothelial dysfunction (ED). Our study aims to determine the utility of serum endocan levels as a marker of ED in patients with TS.

METHODS

41 patients with TS and 25 healthy subjects were enrolled. Auxological parameters were measured, body mass index (BMI) was calculated and standard deviation scores (SDS) was calculated for height, weight, waist circumference (WC), BMI, systolic blood pressure (BPs) and diastolic blood pressure (BPd). Serum endocan levels were measured. Carotid intima media thickness (cIMT) (Fig 2) and flow mediated dilation (FMD) (Fig 1) of the brachial artery were measured. Recent fasting blood glucose, insulin, total cholesterol (TC), high density lipoprotein (HDL), low density lipoprotein (LDL), triglyceride (TG), C-reactive protein (CRP) levels were retrieved from patient records and compared with controls. Homeostatic model assesment – insulin resistance index (HOMA-IR) was calculated.

RESULTS

The study group had a higher mean age. Therefore, SDS was calcuated for all possible parameters to minimize the effect of this age difference on our results. **The study group was shorter than the controls and had higher SDS's for BMI, WC, systolic and diastolic BP. The study group had higher TC, LDL, fasting insulin levels and HOMA-IR values.** Endocan levels, cIMT SDS and FMD were similar in both groups (Table 1).

The study group was further divided with respect to karyotype, cardiac anomalies, insulin resistence, urinary anomalies and thyroiditis. Endocan, cIMT, FMD were similar in both subgroups and controls.

Pubertal patients with TS had higher HOMA-IR than pubertal controls (p=0,028). Endocan, cIMT SDS and FMD were similar in both groups.

Overweight and obese patients with TS were compared with non-overweight TS patients and controls. **FMD was found to be decreased in overweight and obese patients with TS.**

Waist circumference SDS (r=-0.348, p=0.005) and BMI SDS (r=-0.368, p=0.002) of all the subjects in the study were found to be negatively correlated with FMD.

	TS (n=41)	Control (n=25)	p
Mean age (years)	14.7 ± 3.6	11.1 ± 2.9	**0.002**
Height SDS	-2.1 ± 1.3	0.2 ± 0.9	**0.001**
Weight SDS	-0.3 ± 1.9	-0.2 ± 1.2	0.794
BMI SDS	0.8 ± 1.6	-0.3 ± 1.2	**0.003**
WC SDS	1.2 ± 1.2	0.6 ± 0.9	**0.033**
BPs SDS	0.9 ± 0.9	0.1 ± 0.6	**0.001**
BDd SDS	1.2 ± 0.9	0.7 ± 0.7	**0.001**
TC (mg/dL)	174.3 ± 32.1	154.1 ± 14.4	**0.001**
LDL (mg/dL)	93.8 ± 33.4	76.7 ± 16.5	**0.025**
HDL (mg/dL)	63.7 ± 13.9	62.0 ± 14.2	0.640
CRP (mg/L)	1.6 ± 1.7	0.8 ± 0.6	0.079
Fasting insulin (mIU/L)	12.0 ± 5.6	9.2 ± 3.9	**0.027**
HOMA-IR	2.7 ± 1.4	2.0 ± 0.9	**0.016**
Endocan (pg/mL)	1348.1 ± 1004.2	1738.6 ± 861.7	0.111
cIMT SDS	1.97 ± 1.69	1.75 ± 1.71	0.605
FMD (%)	13.1 ± 3.7	13.6 ± 3.45	0.112

Table 1: Summary of Findings

CONLCUSION

Our data do not suggest that serum endocan is a good marker for endothelial dysfunction in pedaitric patients with TS. The only parameters found to influence endothelial functions were BMI and visceral adiposity.

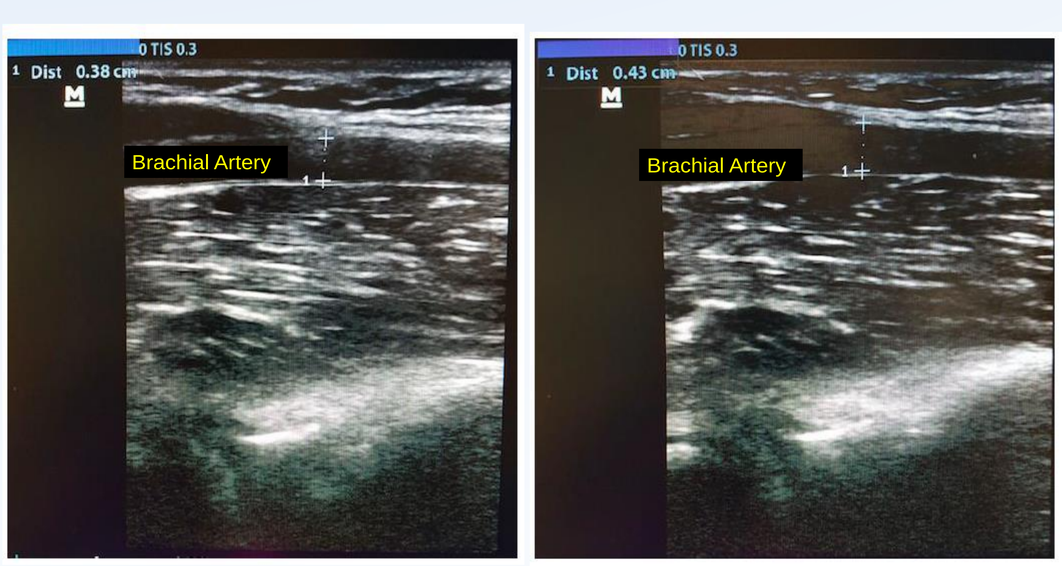

Figure 1: Flow mediated dilation of the brachial artery is a marker of endothelial dysfunction

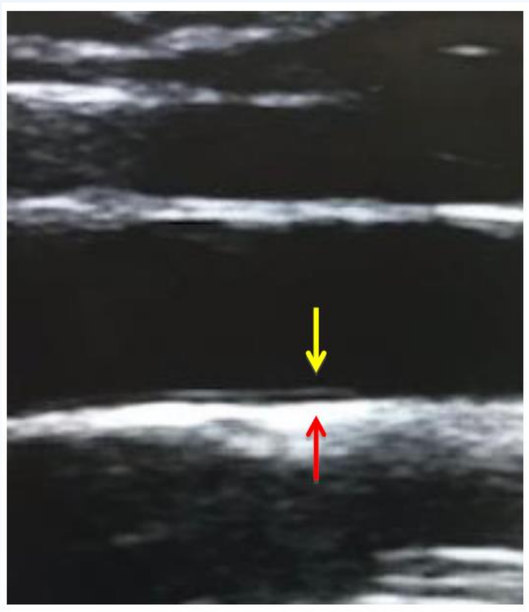

Figure 2: Carotid intima – media thickness (cIMT) is a marker of atherosclerotic burden. The hypodense region between the yellow and red arrows is cIMT.