

Waist circumference triglyceride index (WTI) is useful to predict non-alcoholic fatty liver disease in childhood obesity.

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OBJECTIVES:

We aimed to evaluate the performance of waist circumference triglyceride index (WTI) to predict non-alcoholic fatty liver disease (NAFLD) in obese children.

METHODS:

In this study **139 obese children (71 girls)** were included (**6-18 years**). Height, weight, body mass index (BMI), waist circumference (WC), puberty stage, blood pressure, and biochemical values were obtained from the medical records. SDS and percentiles were calculated. The **WTI** was calculated as **WC (cm) x triglyceride concentration (mmol/L)**. The total cholesterol/HDL-cholesterol index (TC/HDL-C) was calculated. NAFLD was showed by ultrasound: patients were divided into three groups according to the grade of steatosis (normal= grade 0, mild= grade 1, moderate-severe= grade 2-3). The AUC and appropriate cutoff points for WTI were calculated by ROC analysis

RESULTS:

Anthropometric measurements, biochemical values and indexes in patients with and without liver fat are summarized in the **Table 1**. The **WTI** showed a **positive correlation** with **weight** ($\rho=0.38$; $p<0,001$), **insulin** ($\rho=0.4$; $p<0.001$), **HOMA-IR** ($\rho=0.36$; $p<0.001$), **uric acid** ($\rho=0.29$; $p<0.001$), **TC** ($\rho=0.24$; $p=0.004$) and **TC/HDL-C** ($\rho=0.57$; $p<0.001$). It was found that WTI values could be used to diagnose hepatosteatosis [AUC=0.65 (0,56-0,75); $p=0.02$] (**Figure 1**). Sensitivity and specificity values for $WTI \geq 150.1$ cases were found as 68% and 52%, respectively. The medians and p values of WTI in the normal, mild and moderate-severe groups of patients with and without NAFLD are summarized in **Table 2**. The difference between normal and mild group was statistically significant ($p=0.03$), but the difference between mild and moderate-severe groups was not significant ($p>0.005$)

CONCLUSIONS:

The WTI is a powerful and easy tool to predict NAFLD in childhood. This is the first study assessing the accuracy of WTI in childhood obesity.

Table 1: Clinical features and laboratory findings of patients with and without non-alcoholic fatty liver disease (NAFLD)

NAFLD	No (n=71)	Yes (n=68)	
Variable	Mean±SD Median(IQR)	Mean±SD Median(IQR)	p
Age (year)	10.6 ± 2.5	11.9 ± 2.5	0,003**
Gender	Female (n:71(%51,1))	44 (62%)	0,011*
n (%)	Male (n:68 (%48,9))	27 (39.7%)	41 (60,3%)
Weight SDS	2,53 ± 0,85	2,9 ± 0,96	0,007**
BMI	27,4 ± 4,02	30,2±5,5	0,001**
BMI SDS	2,4 ± 0,59	2,7 ± 0,61	0,007**
BMI%	98,2 ± 2,48	99.1 ± 1,09	0,007**
WC (cm)	86,6 ± 11,3	96,8 ± 12,2	<0.001**
Systolic BP (mmHg) (n=102)	115 (10)	120 (15)	0.015***
Diastolic BP (mmHg) (n=102)	72 ± 9,4	76 ± 8,5	0.028**
Fasting glucose (mg/dl)	89 (14)	88,5 (10,7)	0,561***
Insulin (uU/ml)	12,5 (9,7)	18,7 (8,5)	<0.001***
HOMA-IR	2,4 (1,8)	3,7 (1,7)	<0.001***
ALT (IU/L)	16 (9)	28 (27,2)	<0.001***
Uric acid (mg/dl) (n=135)	3,6 (1)	3,8 (1,4)	0.046***
Cholesterol (mg/dl)	162 (45)	171,5 (30,5)	0.33***
Triglyceride (mg/dl)	103,4 ± 42,7	126,8 ± 64,6	0.046***
HDL-C (mg/dl) (n=138)	45 (14)	45 (15)	0.272***
LDL-C (mg/dl) (n=134)	95,6 (35,4)	101,8 (21,4)	0.239***
TC/HDL-C (n=138)	3.7 (1)	3,9 (1,5)	0.11***
WTI	147,6 (82,5)	198,5 (115)	<0.001***

*Chi square ** independent two- simple ***Mann Whitney-u

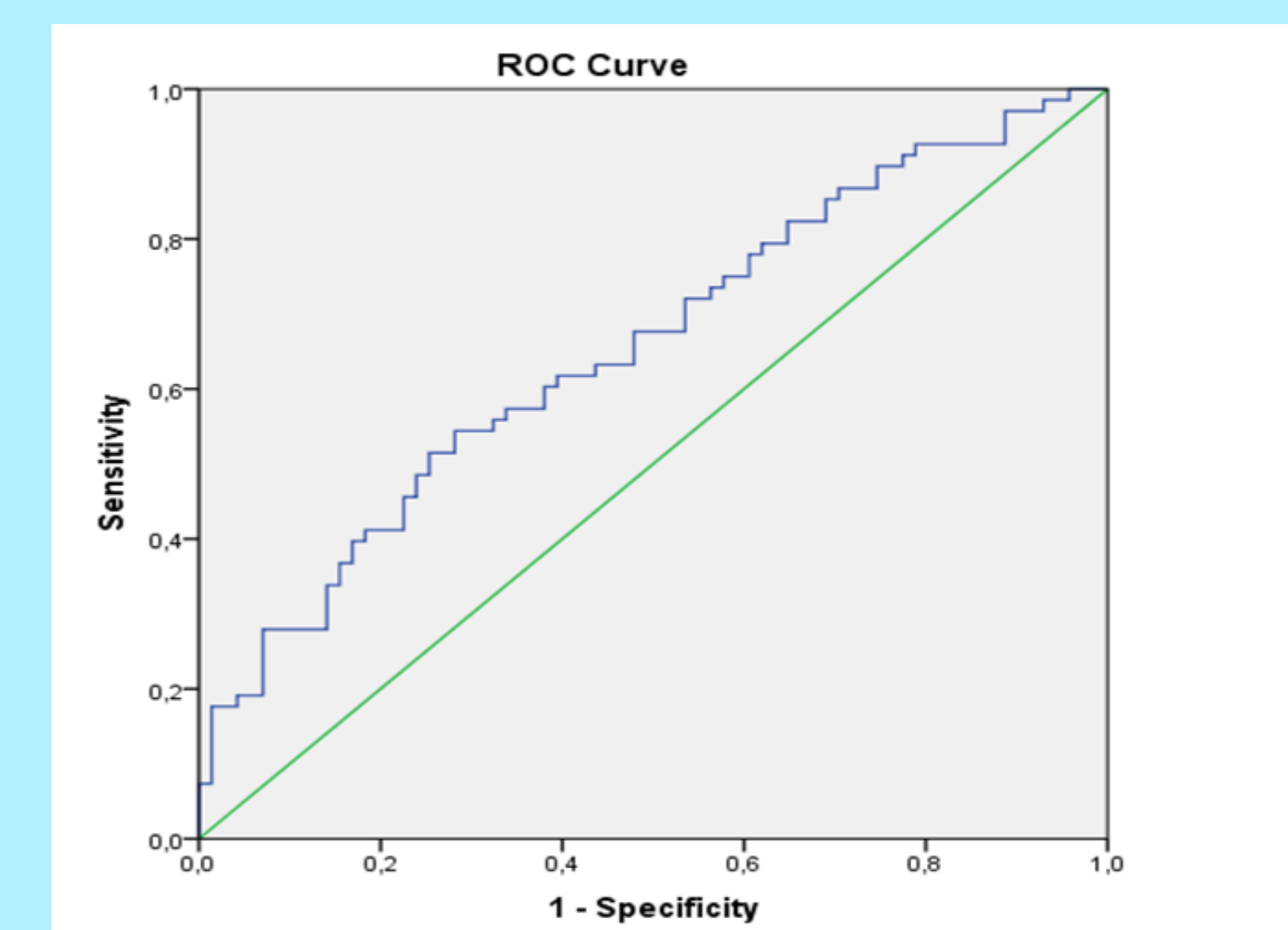


Figure 1: ROC curve of WTI for diagnosis of NAFLD

Table 2: The medians and p values of WTI in the normal, mild and moderate-severe groups of patients with and without NAFLD.

NAFLD	Mean± SD	WTI Median (IQR)	p
Normal	156,7±65,9	149,5 (94,3)	
Mild	216,3± 114,3	189,9 (131,8)	0,007
Moderate to severe	196,6±83,7	196,8 (127,1)	

