

# MATSUDA INDEX IN CORRELATION WITH CLINICAL INDICATORS OF INSULIN RESISTANCE IN CHILDREN AND ADOLESCENTS

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## BACKGROUND

Obesity-related insulin resistance is present in obese children and Matsuda index is a method proposed to evaluate insulin resistance, using data obtained from the oral glucose tolerance test (OGTT).

## OBJECTIVE

To investigate whether the clinical indicators of family history of obesity and / or Type II diabetes, acanthosis nigricans, and increased waist circumference are associated with insulin resistance, as calculated by the Matsuda index and if they could be used as selection markers for patients to undergo OGTT. Moreover, the correlation of insulin resistance with the coexistence of metabolic syndrome.

## METHODS

- Data from 95 overweight and obese children (47 boys and 48 girls) with mean age 10.7 ±2.2 years were analyzed.
- Student's t-tests were used for the comparison of means and Pearson correlation coefficients were used to explore the association of two continuous variables.

## RESULTS

- Insulin resistance was found in 39.1% of the children.
- The mean MATSUDA index was 3.4 (SD=1.9).
- The mean AUC for glucose was 14211.3 (SD=2016.5) and for insulin 13484.2 (SD=11985.3).
- Matsuda index was significantly lower in cases with acanthosis nigricans (p=0.007), in those with metabolic syndrome and in puberty.
- Matsuda index was significantly correlated with waist circumference (r=-0.40, p=0.006).
- The proportion of those with insulin resistance was similar in boys and girls and greater in puberty.
- AUC for insulin was significantly greater in cases with acanthosis nigricans (p=0.007) or metabolic syndrome (p=0.006).
- Waist circumference was also predictive for AUC for insulin (r=0.30, p=0.044).

## MATSUDA INDEX

		Matsuda index		P Student's t-test
		Mean	SD	
Gender	Boys	3.66	1.97	NS
	Girls	3.13	1.85	
History of T2DM	No	3.49	1.88	NS
	Yes	3.19	1.99	
History of obesity	No	3.38	2.04	NS
	Yes	3.36	1.84	
Puberty	No	3.83	1.98	0.01
	Yes	2.81	1.69	
Acanthosis Nigricans	No	3.77	1.93	0.007
	Yes	2.64	1.71	
HOMA>2.5	No	4.55	1.54	<0.001
	Yes	1.57	0.52	
Met. Syndr.	Yes	2.41	1.66	0.015
	No	3.89	1.91	

## INSULIN RESISTANCE

		Insulin resistant<2.5				P Pearson's x <sup>2</sup> test
		No		Yes		
		N	%	N	%	
Gender	Boys	29	64.4	16	35.6	NS
	Girls	27	57.4	20	42.6	
Puberty	No	38	73.1	14	26.9	0.006
	Yes	18	45.0	22	55.0	

## AUC

		AUC (insulin)		P Student's t-test
		Mean	SD	
History of T2DM	No	11875.46	7498.02	NS
	Yes	16345.72	16703.07	
History of obesity	No	1485.04	15908.41	NS
	Yes	12780.19	8517.24	
Acanthosis Nigricans	No	11047.09	7742.46	0.007
	Yes	18108.15	16560.7	
Met. Syndr	Yes	20001.25	22591.10	0.007
	No	10411.76	6115.35	

## REFERENCES

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		WC	HOMA-IR
AUC (glucose)	r	0.09	0.50
	P	0.550	<0.001
AUC (insulin)	r	0.30	0.71
	P	0.044	<0.001

## CONCLUSION

Family history of obesity and diabetes, acanthosis nigricans and increased waist circumference are associated with insulin resistance and can be used as clinical markers to indicate that a patient should undergo OGTT. In addition, increased insulin sensitivity is associated with better metabolic profile as reflected by lower levels of triglycerides, LDL and higher HDL.