



LISIR CALCULATOR

MANUAL BOOK

LIPID INDEX SURROGATE INSULIN RESISTANCE_CALCULATOR

PANDUAN PENGGUNAAN LISIR CALCULATOR (LIPID INDEX SURROGATE INSULIN RESISTANCE)

Pendahuluan

Penilaian resistensi insulin mempunyai nilai prevensi yang besar. Resistensi insulin merupakan penanda yang muncul beberapa tahun sebelum diabetes terdiagnosis, sehingga sudah dapat dinilai tepat pada periode prediabetes. Resistensi insulin merupakan prediktor yang berperan penting dalam patogenesis dan dampak klinis diabetes mellitus tipe 2.

Penilaian resistensi insulin dengan Hyperinsulinemic– Euglycemic Clamp maupun HOMA-IR (Homeostasis Model Assessment Insuline Resistance) di komunitas secara massal pada negara berkembang seperti Indonesia masih belum praktis dan aplikatif dilaksanakan dengan pertimbangan efisiensi biaya. Berdasarkan hasil penelitian Iche, dkk tahun 2019 mengenai *cut off point* yang optimal dari *visceral adiposity index*, *lipid accumulation product*, dan *Triglyceride Glucose Index* sebagai surrogate resistensi insulin pada prediabetes menunjukkan bahwa nilai diagnostik ketiganya terkategori excellent.

Namun perhitungan dengan penggunaan rumus yang masih sulit digunakan jika tidak menggunakan alat bantu seperti kalkulator juga mempersulit penggunaan surrogate market ini. Program komputer ini berupa file excel yang sudah dilengkapi dengan formula agar mempermudah para tenaga kesehatan maupun peneliti dalam melakukan perhitungan surrogate resistensi insulin.

Program komputer ini diberi nama ***LISIR CALCULATOR (LIPID INDEX SURROGATE INSULIN RESISTANCE)***.

Fitur dan Tampilan Triglyceride Glucose (TyG) index

The screenshot displays a Microsoft Excel spreadsheet titled "Lipid Index Calc" with a green-themed interface. The main content is a calculator for the Triglyceride Glucose (TyG) index. It features several input fields and a calculation result area.

Input Fields:

- Nama (Name)
- Usia (Age)
- Sex
- Alamat (Address)
- Nomor Hp (Phone Number)
- Fasting Triglyceride
- Fasting Glucose

Calculation Results:

- TyG Index:** #NUM! (highlighted in yellow)

Interpretasi (Interpretation):

Normoglikemik jika <= 4,6523
Risiko Prediabetes jika 4,6524 - 5,1547
Risiko Diabetes jika >5,1547

Additional Text:

- "Silahkan diisi dengan hasil pemeriksaan kadar trigliserid puasa" (Please fill with the result of fasting triglyceride examination)
- "Silahkan diisi dengan hasil pemeriksaan kadar glukosa darah puasa" (Please fill with the result of fasting blood glucose examination)
- "Prediksi surrogate resistensi insulin berada pada kategori status glukosa darah" (Insulin resistance prediction is in the category of blood glucose status)

Data Table:

Nama	Alamat	Usia	Jenis Kelamin	Nomor Hp	Triglyceride	Glucose

Referensi (References):

- Gonzalez-David Navarro, Laura Sánchez-Rigo, Juan Pastrana-Deigado, et al. (2016). Triglyceride-glucose index (TyG index) in comparison with fasting plasma glucose improved diabetes prediction in patients with normal fasting glucose: The Vascular-Metabolic CUN cohort. *Preventive Medicine*, 86, 99-105.
- Iche Andriyani Liberty, Muhammad Atza, Puji Rizki Suryani. (2019). Laporan Penelitian Prototipe Diagnostik Non-Invasif untuk Prediksi

The spreadsheet interface includes standard Excel menus (Home, Insert, Draw, Page Layout, Formulas, Data, Review, View, Acrobat) and a ribbon with various toolbars. The status bar at the bottom shows "Ready" and a zoom level of 40%.

3

Triglyceride Glucose (TyG) index

Formula for Male and Female¹

$$\ln [\text{fasting TG (mg/dl)} \times \text{FPG (mg/dl)} / 2]$$

Result²

- ☐ Normoglikemik $\leq 4,6523$
- ☐ Prediabetes $4,6524 - 5,1547$
- ☐ Diabetes $>5,1547$

References

1. González-David Navarro, Laura Sánchez-Íñigo, Juan Pastrana-Delgado, et al. (2016). Triglyceride–glucose index (TyG index) in comparison with fasting plasma glucose improved diabetes prediction in patients with normal fasting glucose: The Vascular-Metabolic CUN cohort. *Preventive Medicine*, 86;99– 105.
2. Iche Andriyani Liberty, Muhammad Aziz, Puji Rizki Suryani. (2019). Laporan Penelitian Prototipe Diagnostik Non-Invasif untuk Prediksi Konversi Prediabetes Pada Populasi. Universitas Sriwijaya.

Fitur dan Tampilan Visceral Adiposity Index

Lipid Index Calc | Search Sheet | Share

Home | Insert | Draw | Page Layout | Formulas | Data | Review | View | Acrobat

| 28 | A | A | | Conditional Formatting | Format as Table | Cell Styles | Insert | Delete | Format | Sort & Filter | Find & Select | Create and Share Adobe PDF

115 | fx

Visceral Adiposity Index

Nama	<input type="text"/>	HDL	<input type="text"/>
Sex	<input type="text"/>	Fasting Triglyceride	<input type="text"/>
Weight (kg)	<input type="text"/>	VAI Laki-Laki	#DIV/0!
Height (cm)	<input type="text"/>	VAI Perempuan	#DIV/0!
BMI	#DIV/0!	Interpretasi	Normoglikemik jika <= 4,2733 Risiko Prediabetes jika 4,2734 - 5,5725 Risiko Diabetes jika >5,5725
Waist Circumference	<input type="text"/>		

Nama	Weight (kg)	Height (cm)	BMI	Waist Circumferens	HDL	Triglyceride

Referensi

1. Jheon JH, Okamoto C, Pittone A, Galiszer A. (2011) Cut-off points of the visceral adiposity index (VAI) identifying a visceral adipose dysfunction associated with cardiometabolic risk in a Caucasian Sicilian population. *Lipids Health Dis.* 2011 Oct 19;10:183. doi: 10.1186/1476-2875-10-183. PMID: 22019545. PMCID: PMC3224546.
2. Iche Andriyani Liberty, Muhammad Aziz, Puji Rizki Suryani. (2019). Laporan Penelitian Prototipe Diagnostik Non-Invasif untuk Prediksi Konversi Prediabetes Pada Populasi. Universitas Sriwijaya.

TyG Index | **VAI** | LAP | Contoh Penggunaan | +

Ready | 33%

Silahkan diisi dengan hasil pemeriksaan kadar HDL puasa

Silahkan diisi dengan hasil pemeriksaan kadar trigliserid puasa

Silahkan diisi dengan berat dan tinggi badan, maka IMT atau BMI akan otomatis terisi

Silahkan diisi dengan hasil pengukuran lingkur perut

Visceral Adiposity Index (VAI)

Formula¹

$$\text{VAI Female} = (\text{WC}/36.58 + (1.89 \times \text{BMI})) \times (\text{TG}/0.81) \times (1.52/\text{HDL})$$

$$\text{VAI Male} = (\text{WC}/(39.68 + (1.88 \times \text{BMI})) \times (\text{TG}/1.03) \times (1.31/\text{HDL})$$

Result²

- ☐ Normoglikemik $\leq 4,2733$
- ☐ Prediabetes 4,2734– 5,5725
- ☐ Diabetes $> 5,5725$

References

1. Amato MC, Giordano C, Pitrone M, Galluzzo A. (2011) Cut-off points of the visceral adiposity index (VAI) identifying a visceral adipose dysfunction associated with cardiometabolic risk in a Caucasian Sicilian population. *Lipids Health Dis.* 2011 Oct 19;10:183. doi: 10.1186/1476-511X-10-183. PMID: 22011564; PMCID: PMC3224548.
2. Iche Andriyani Liberty, Muhammad Aziz, Puji Rizki Suryani. (2019). Laporan Penelitian Prototipe Diagnostik Non-Invasif untuk Prediksi Konversi Prediabetes Pada Populasi. Universitas Sriwijaya.

Fitur dan Tampilan Lipid Accumulation Product

The screenshot displays an Excel spreadsheet with the following components:

- Title Bar:** "Lipid Index Calc" with a search bar and share icon.
- Formulas Bar:** Shows the formula $=SUM(E20-65)*(E17*0,0555)$ in cell H11.
- Main Form:**
 - Header:** "Lipid Accumulation Product" in a yellow box.
 - Inputs:**
 - Name:
 - Sex:
 - Fasting Triglyceride:
 - Waist Circumference:
 - Outputs:**
 - LAP Laki-laki: 0,0000
 - LAP Perempuan: 0,0000
 - Interpretasi:
 - Normoglikemik jika <= 21,023
 - Risiko Prediabetes jika 21,024- 45,3566
 - Risiko Diabetes jika >45,3566
- Table:**

Nama	Alamat	Usia	Jenis Kelamin	Nomor Hp	Triglyceride	Glucose
- References:**
 - 1. Kahn H. S. (2005). The "lipid accumulation product" performs better than the body mass index for recognizing cardiovascular risk: a population-based comparison. *BMC cardiovascular disorders*, 5, 26. <http://doi.org/10.1186/1471-2261-5-26>
 - 2. Iche Andriyani Liberty, Muhammad Aziz, Puji Rizki Suryani. (2019). Laporan Penelitian Prototipe Diagnostik Non-Invasif untuk Prediksi Konversi Prediabetes Pada Populasi. Universitas Sriwijaya.

Lipid Accumulation Product (LAP)

Formula¹

$$\text{LAP Male} = (\text{WC[cm]} - 65) \times (\text{Trigliserida (mmol/L)})$$

$$\text{LAP Female} = (\text{WC[cm]} - 58) \times (\text{Trigliserida (mmol/L)})$$

Result²

☐ Normoglikemik $\leq 21,023$

☐ Prediabetes 21,024– 45,3566

☐ Diabetes $>45,3566$

References

1. Mirmiran P, Bahadoran Z, Azizi F. (2014). Lipid accumulation product is associated with insulin resistance, lipid peroxidation, and systemic inflammation in type 2 diabetic patients. *Endocrinol Metab (Seoul)* 2014;29:443–449.
2. Iche Andriyani Liberty, Muhammad Aziz, Puji Rizki Suryani. (2019). Laporan Penelitian Prototipe Diagnostik Non-Invasif untuk Prediksi Konversi Prediabetes Pada Populasi. Universitas Sriwijaya.

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