

DESIDERO UNA GRAVIDANZA MA.... COME GESTIRE

Insulino resistenza e PCOS

Basilio Pintaudi

SC Diabetologia

Ospedale Niguarda - Milano

Diapositiva preparata da BASILIO PINTAUDI e ceduta alla Società Italiana di Diabetologia.
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Io sottoscritto Pintaudi Basilio

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Polycystic ovary syndrome: definition, aetiology, diagnosis and treatment

Héctor F. Escobar-Morreale^{1,2,3,4}

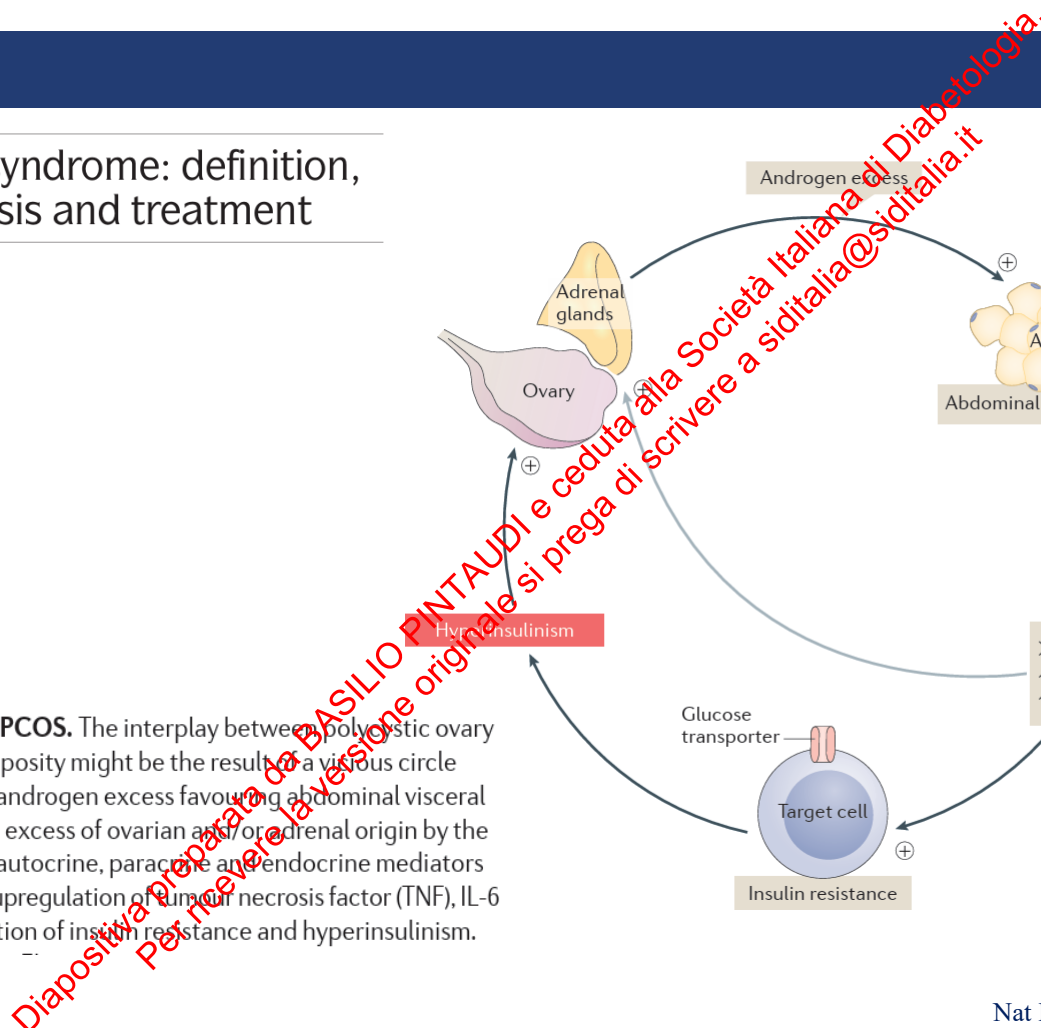
Abstract | Polycystic ovary syndrome (PCOS) is one of the most common endocrine and metabolic disorders in premenopausal women. Heterogeneous by nature, PCOS is defined by a combination of signs and symptoms of androgen excess and ovarian dysfunction in the absence of other specific diagnoses. The aetiology of this syndrome remains largely unknown, but mounting evidence suggests that PCOS might be a complex multigenic disorder with strong epigenetic and environmental influences, including diet and lifestyle factors. PCOS is frequently associated with abdominal adiposity, insulin resistance, obesity, metabolic disorders and cardiovascular risk factors. The diagnosis and treatment of PCOS are not complicated, requiring only the judicious application of a few well-standardized diagnostic methods and appropriate therapeutic approaches addressing hyperandrogenism, the consequences of ovarian dysfunction and the associated metabolic disorders. This article aims to provide a balanced review of the latest advances and current limitations in our knowledge about PCOS while also providing a few clear and simple principles, based on current evidence-based clinical guidelines, for the proper diagnosis and long-term clinical management of women with PCOS.

Polycystic ovary syndrome: definition, aetiology, diagnosis and treatment

Héctor F. Escobar-Morreale^{1,2,3,4}

Polycystic ovary syndrome (PCOS) is a heterogeneous disorder that is defined by a combination of signs and symptoms of androgen excess (hirsutism and/or hyperandrogenaemia) and ovarian dysfunction (oligo-ovulation and/or polycystic ovarian morphology (PCOM)), provided that other specific diagnoses, such as hyperprolactinaemia and non-classic congenital adrenal hyperplasia, have been excluded.

The prevalence of PCOS in premenopausal women ranges from ~6% to ~20%, possibly making this syndrome the most common endocrine and metabolic disorder in women of reproductive age.

Héctor F. Escobar-Morreale^{1,2,3,4}Héctor F. Escobar-Morreale^{1,2,3,4}

Androgen excess

Adrenal glands

Ovary

Abdominal

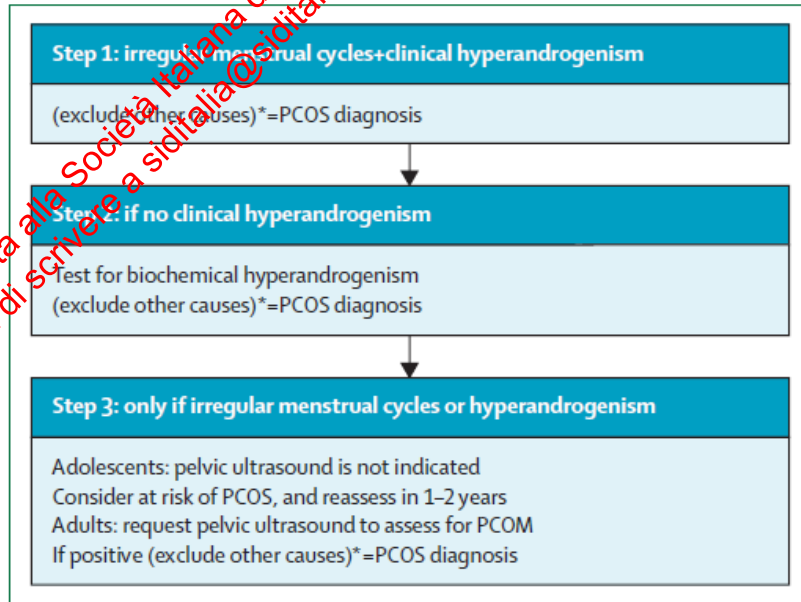
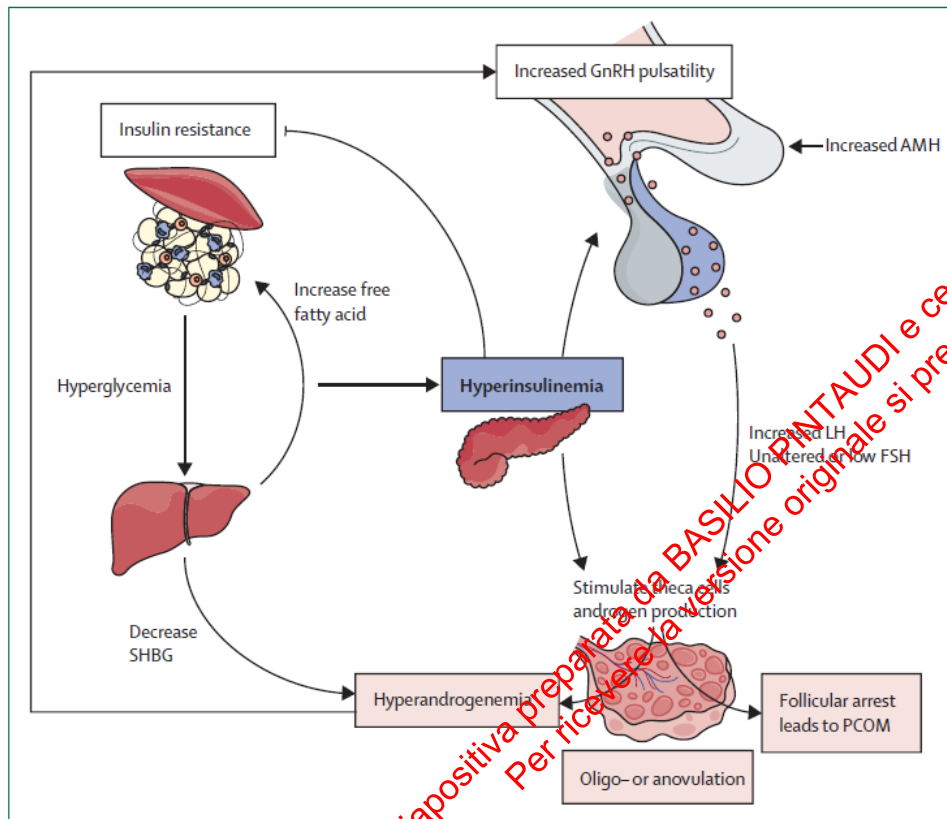
Glucose transporter

Target cell

Insulin resistance

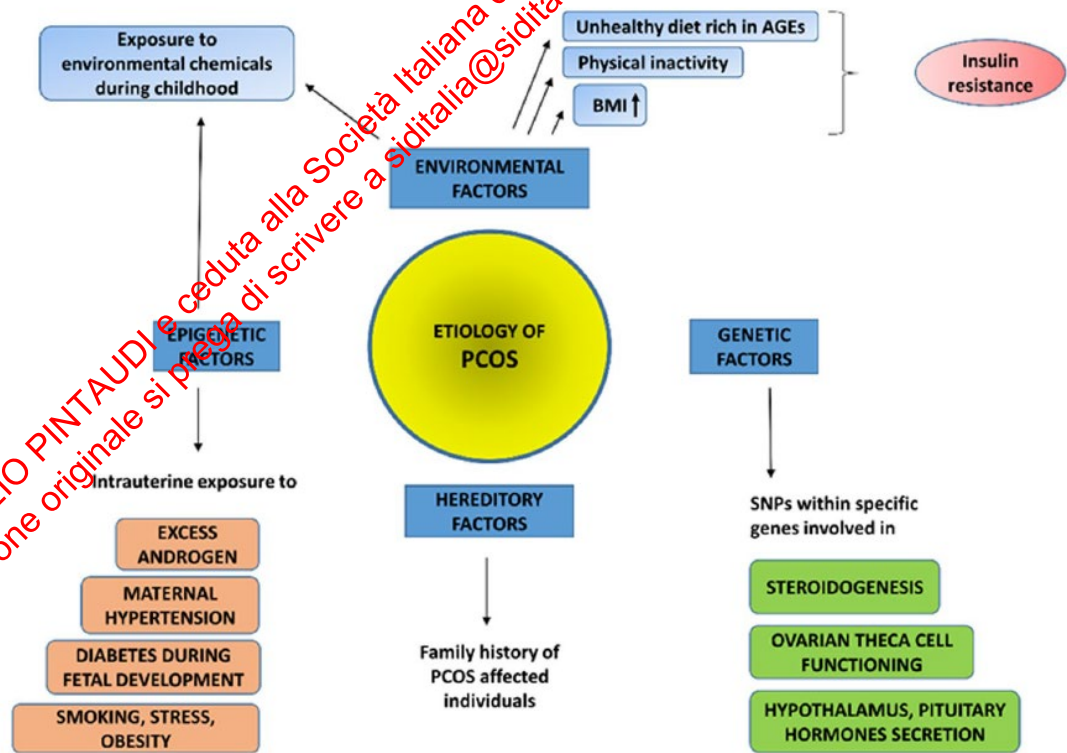
Hyperinsulinism

PCOS. The interplay between polycystic ovary syndrome and insulin resistance might be the result of a vicious circle of androgen excess favouring abdominal visceral fat accumulation, excess of ovarian and/or adrenal origin by the autocrine, paracrine and endocrine mediators, upregulation of tumour necrosis factor (TNF), IL-6 and consequent insulin resistance and hyperinsulinism.



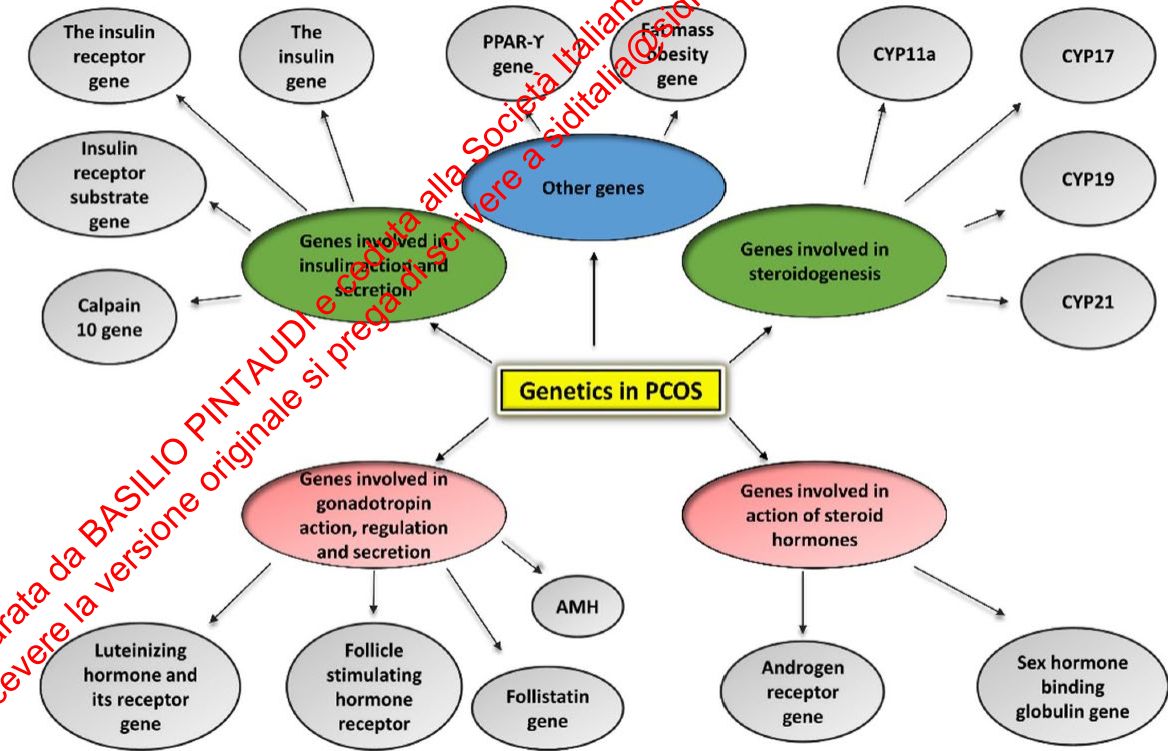
A brief insight into the etiology, genetics, and immunology of polycystic ovarian syndrome (PCOS)

Sana Siddiqui¹ · Somaiya Mateen¹ · Rizwan Ahmad¹ · Shagufta Moin¹



A brief insight into the etiology, genetics, and immunology of polycystic ovarian syndrome (PCOS)

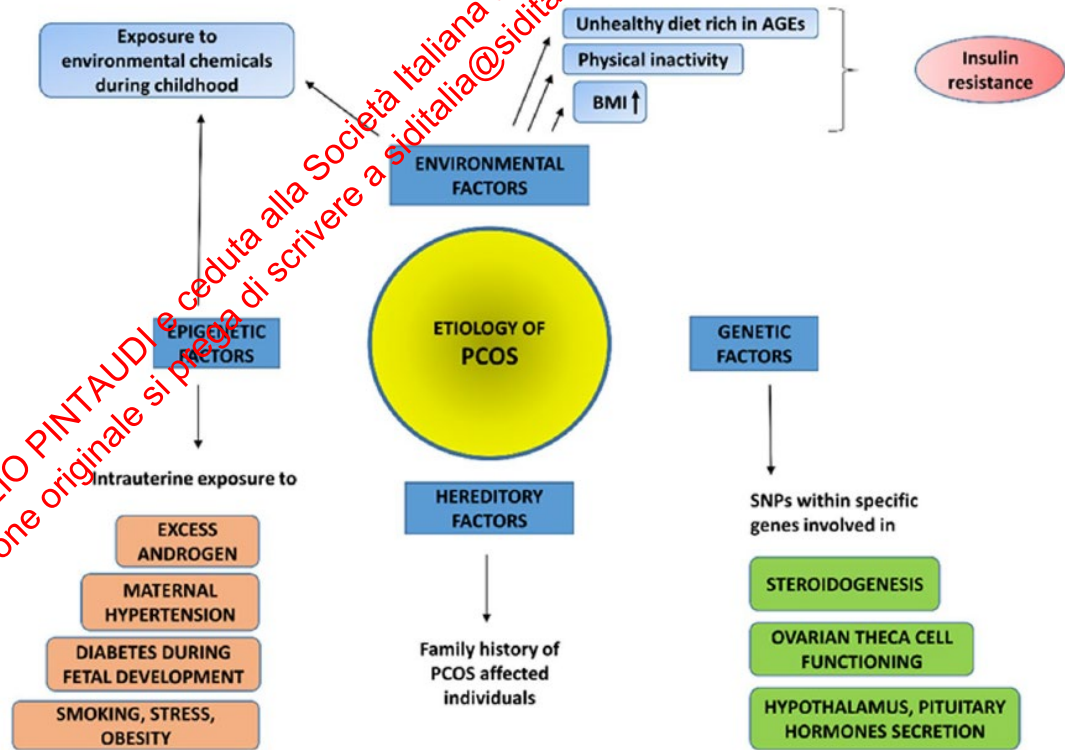
Sana Siddiqui¹ · Somaiya Mateen¹ · Rizwan Ahmad¹ · Shagufta Moin¹ 



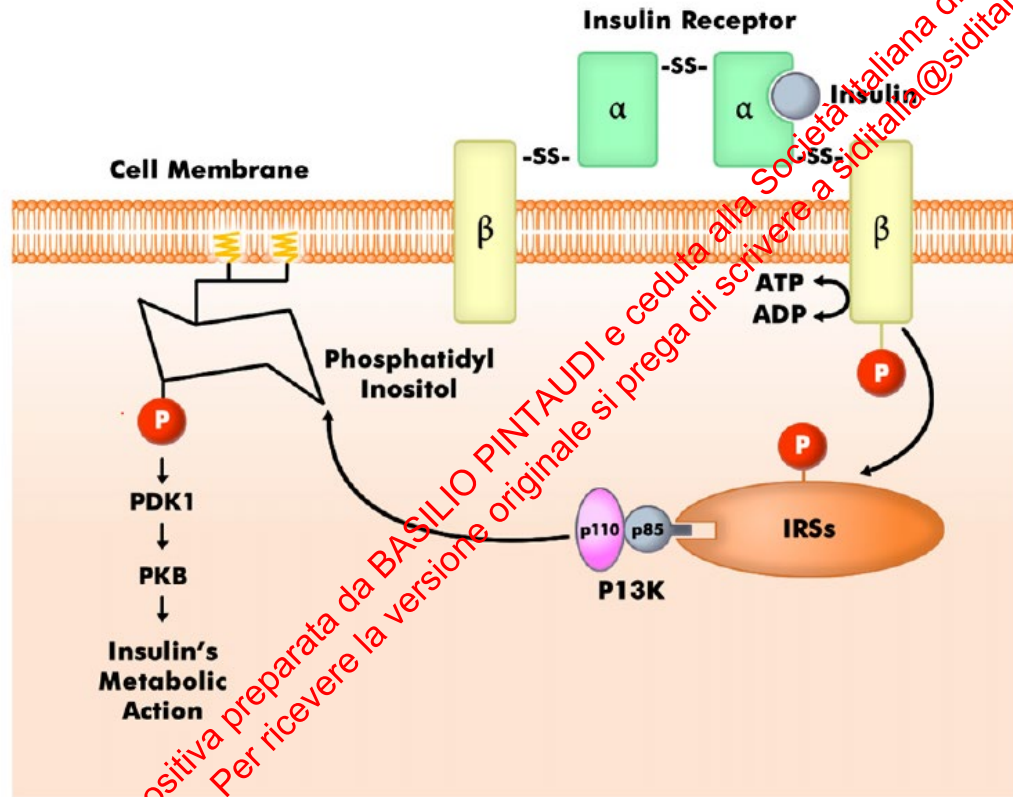
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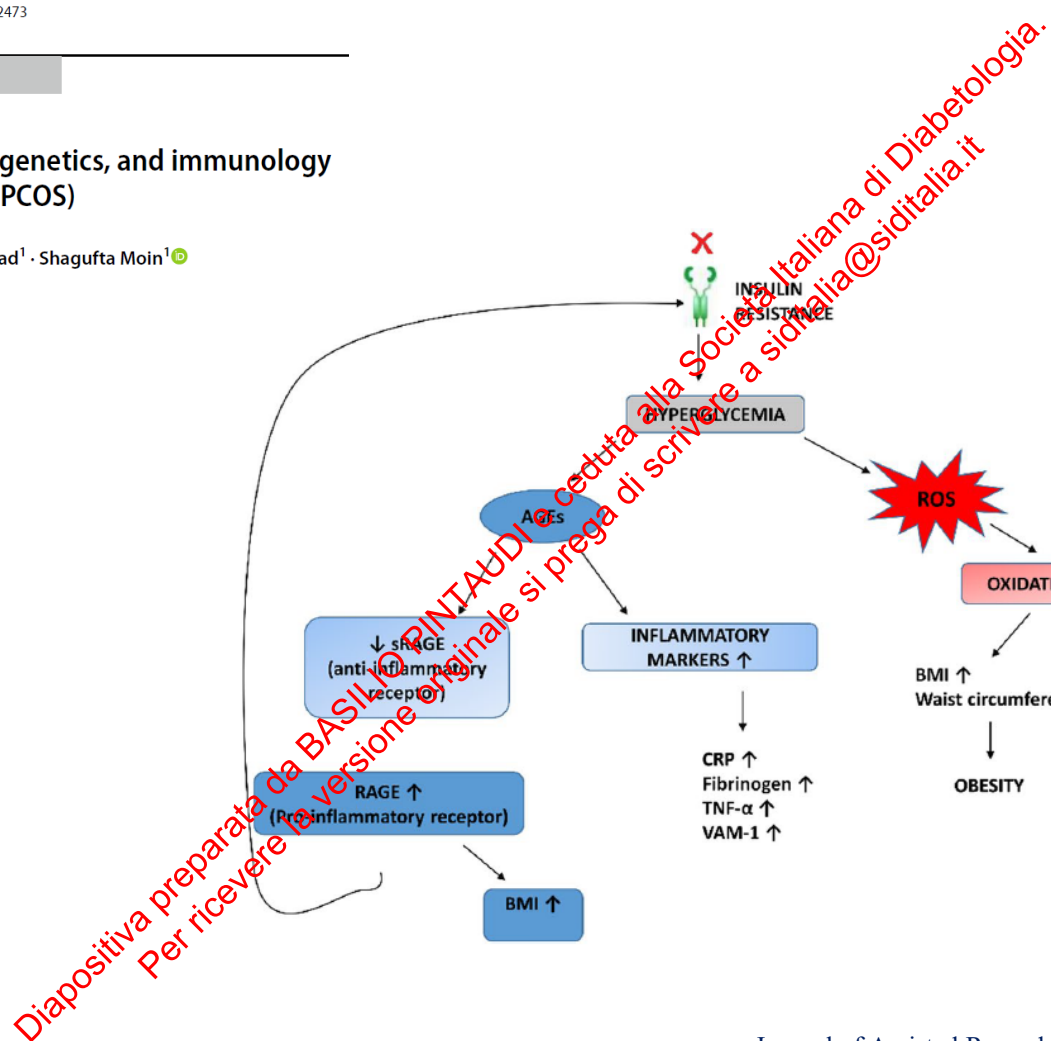


Fisiopatologia dell'insulino resistenza



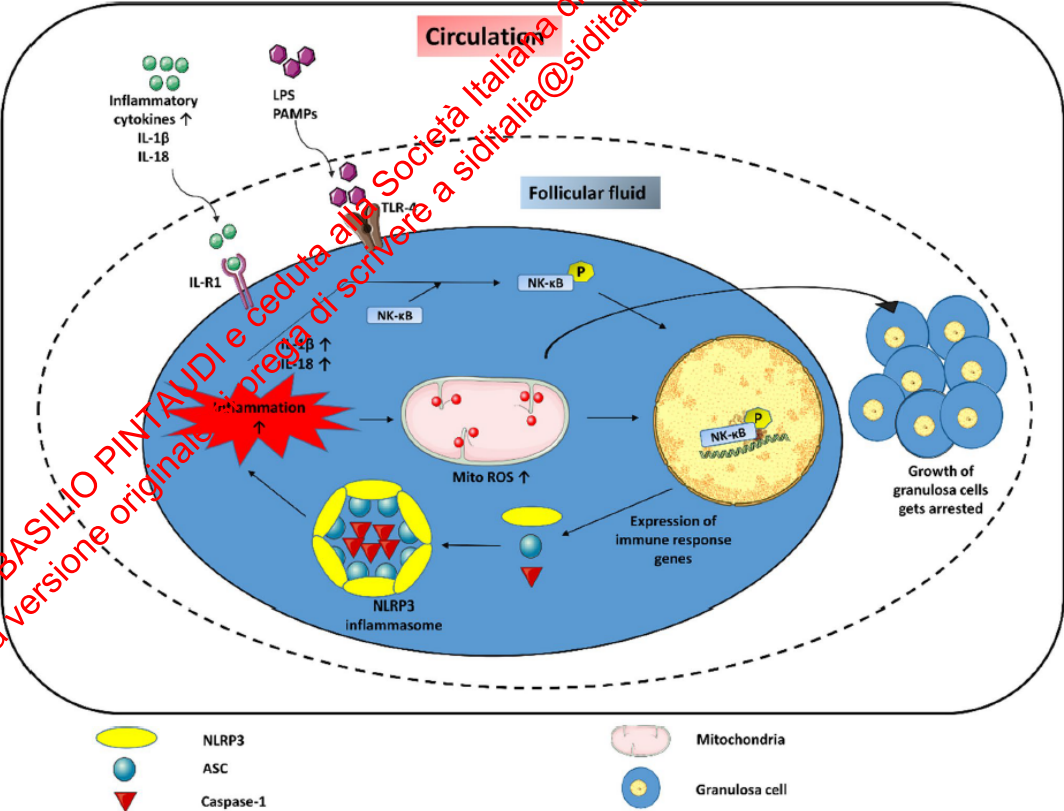
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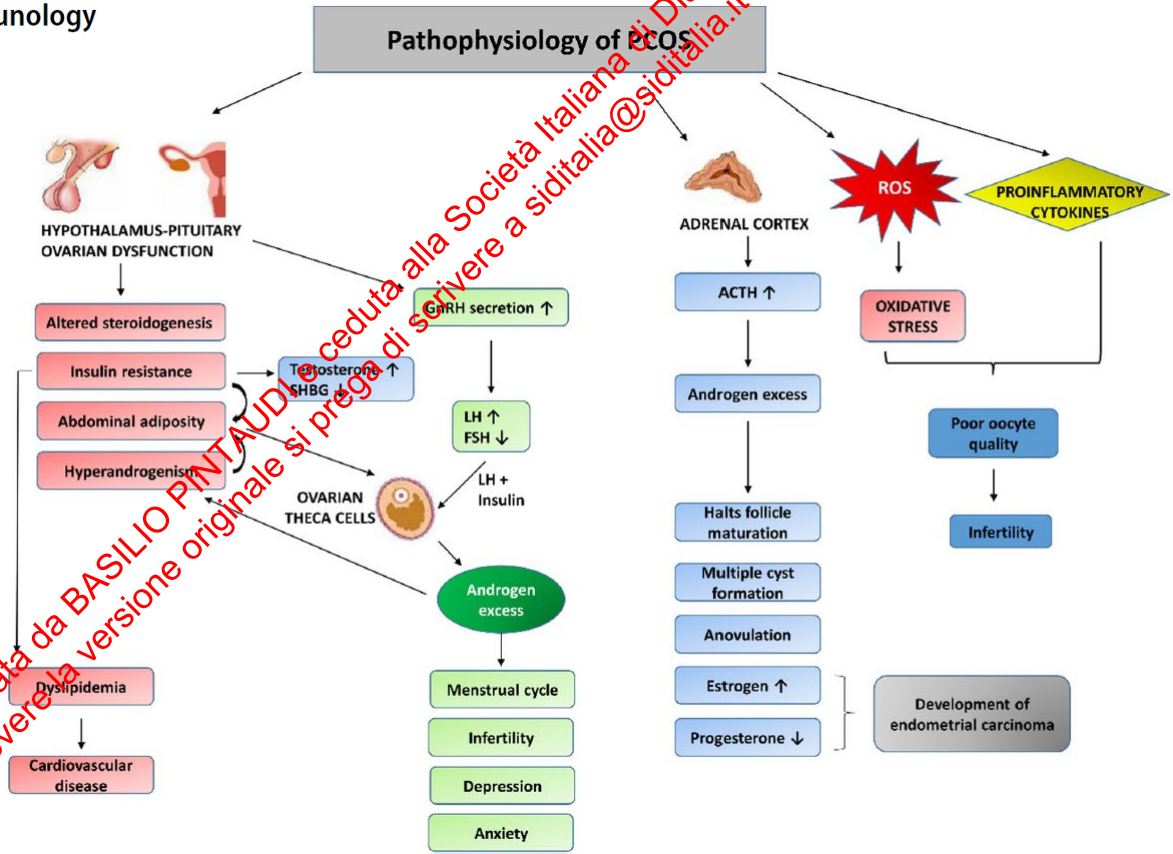
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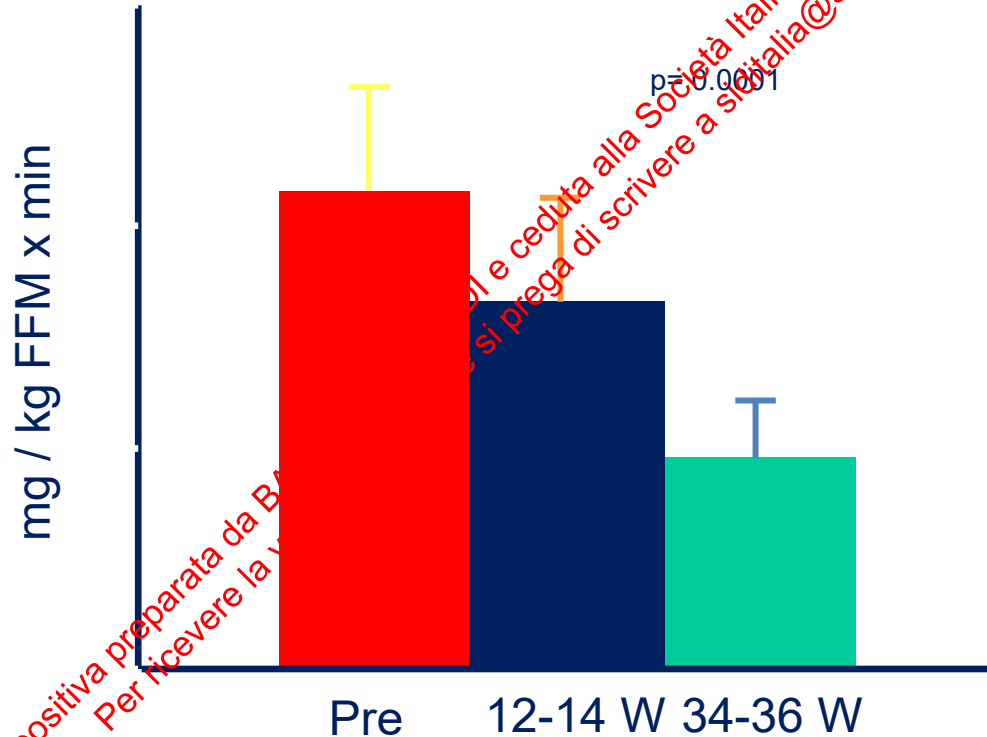
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L'insulino-resistenza **NON** è una malattia

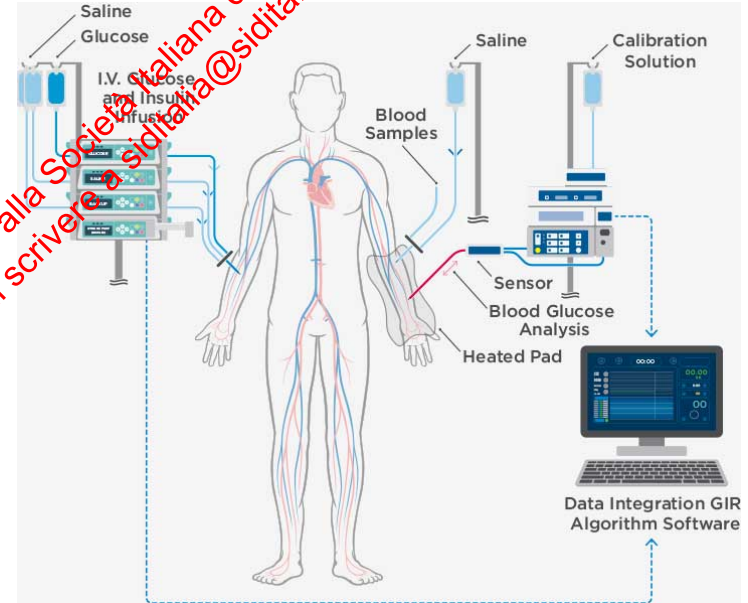
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Changes in insulin sensitivity during pregnancy in nondiabetic women



Glucose clamp technique: a method for quantifying insulin secretion and resistance

RALPH A. DeFRONZO, JORDAN D. TOBIN, AND REUBIN ANDRES
Department of Medicine, Yale University School of Medicine, New Haven, Connecticut 06510; and Clinical Physiology Branch, Gerontology Research Center, National Institute of Aging, Baltimore City Hospitals, Baltimore, Maryland 20014



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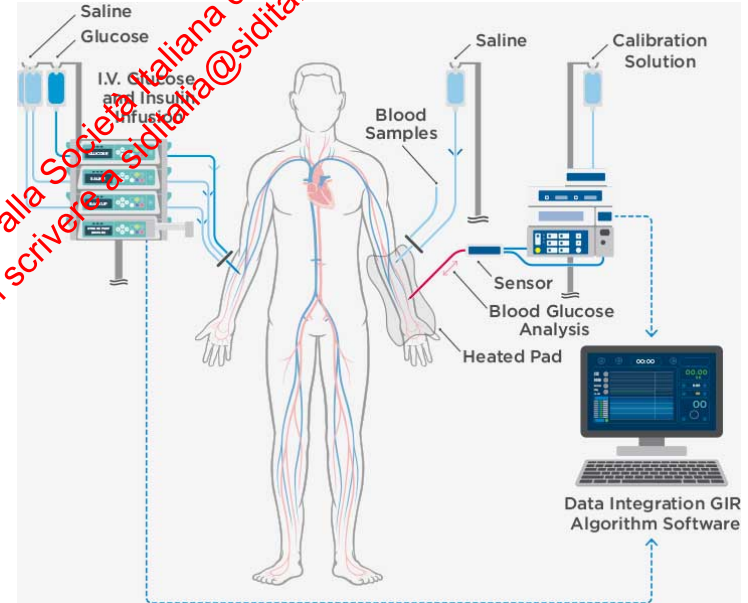
Homeostatic Model Assessment for Insulin Resistance

$$\text{HOMA-IR} = (\text{glucemia} \times \text{insulinemia}) / 22.5$$

Glicemia in mmol/L

Insulina in mU/L

Valori di normalità: 0,23-2,5





Polycystic ovary syndrome

Anju E Joham, Robert J Norman, Elisabet Stener-Victorin, Richard S Legro, Stephen Franks, Lisa J Moran, Jacqueline Boyle, Helena J Teede

	1990 NIH criteria			
	2003 Rotterdam criteria ¹¹ endorsed by NIH ¹⁰ and international evidence-based PCOS guidelines			
	Phenotype A	Phenotype B	Phenotype C	Phenotype D
Hyperandrogenism				
Ovulatory dysfunction				
PCOM				

Figure 3: PCOS diagnostic criteria and phenotypes



Available online at www.sciencedirect.com

Metabolism

www.metabolismjournal.com



Female Reproductive Endocrinology

Polycystic ovarian syndrome (PCOS): Long-term metabolic consequences

Panagiotis Anagnostis^{a,*}, Basil C. Tarlatzis^a, Robert P. Kauffman^b



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Manifestazioni cliniche dell'insulino resistenza

- ✓ Alterazioni minori della glicemia
- ✓ Diabete mellito
- ✓ Sindrome metabolica
- ✓ Diabete gestazionale

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Metabolic disturbances in non-obese women with polycystic ovary syndrome: a systematic review and meta-analysis

Shiqin Zhu, M.D.,^{a,b,c} Bingqian Zhang, M.D.,^{a,b,c} Xiao Jiang, M.D.,^{a,b,c} Zeyan Li, M.D.,^d
Shigang Zhao, M.D., Ph.D.,^{a,b,c} Linlin Cui, M.D., Ph.D.,^{a,b,c} and Zi-Jiang Chen, M.D., Ph.D.,^{a,b,c,e,f}

Diapositiva preparata da BASILIO PATAUDA e presentata alla Società Italiana di Diabetologia.
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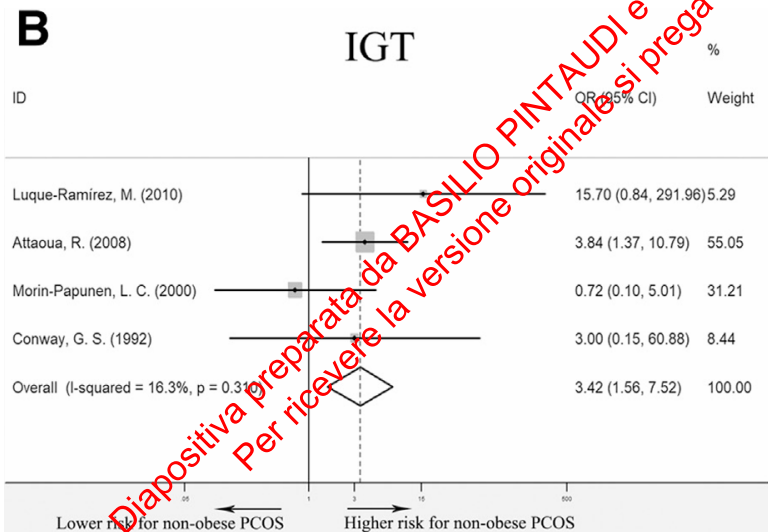
PCOS e Impaired Glucose Tolerance

Meta-analysis results for glucose metabolic disturbances and cardiovascular disease risk factors.

Outcome	No. of studies	Effects model	OR (95%CI)	P value	Heterogeneity	
					P_h value	I^2 (%)
Comparison in glucose metabolism disturbances						
HIN	1		36.27 (1.76, 747.12)			
IR	3	Random	5.70 (1.46, 22.32)	.012	0.005	81.1
IFG	4	Random	1.08 (0.46, 2.53)	.864	0.309	50.4
IGT	4	Fixed	3.42 (1.56, 7.52)	.002	0.310	16.3
Pre-DM	3	Fixed	1.39 (0.73, 2.63)	.317	0.459	0
T2DM	5	Fixed	1.47 (1.11, 1.93)	.005	0.555	0
T2DM cohort	3	Fixed	1.48 (1.12, 1.95)	.007	0.245	29

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Manifestazioni cliniche dell'insulino resistenza

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PCOS in Diabete mellito di tipo 2 pediatrico



Original Investigation | Diabetes and Endocrinology

Prevalence of Polycystic Ovary Syndrome in Patients With Pediatric Type 2 Diabetes A Systematic Review and Meta-analysis

Milena Cioana, BHSc; Jiawen Deng; Ajantha Nadarajah, BHSc; Maggie Hou, BHSc; Yuan Qiu, BHSc; Sondra Song Jie Chen, BHSc; Angelica Rivas, BHSc; Laura Banfield, MLIS, MHSc; Haifa Alfaraidi, MD; Ahlam Alotaibi, MD; Lehana Thabane, PhD, MSc; Constantine Samaan, MD, MSc

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PCOS in Diabete mellito di tipo 2 pediatrico

JAMA
Meta-Analysis
Open.

Original Investigation | Diabetes and Endocrinology

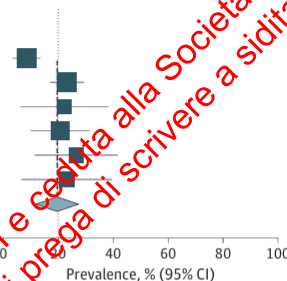
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Figure 2. Forest Plot Showing Prevalence of Polycystic Ovary Syndrome in Patients With Pediatric Type 2 Diabetes

Study	Diagnoses	Total	Weight, %	Prevalence (95% CI)
Amed et al, 2012 (Canada) ⁴⁵	11	130	23.4	8.46 (3.68-13.25)
Amutha et al, 2012 (India) ⁴⁶	45	195	22.3	23.08 (17.16-28.99)
Balasanthiran et al, 2012 (UK) ⁴⁷	6	27	12.2	22.22 (6.54-37.90)
Pérez-Perdomo et al, 2005 (Puerto Rico) ⁴⁸	12	58	17.3	20.69 (10.26-31.11)
Shield et al, 2009 (UK and Republic of Ireland) ⁵⁰	9	34	13.0	26.47 (11.64-41.30)
Zdravkovic et al, 2004 (Canada) ⁴⁹	6	26	11.8	23.08 (6.88-39.27)
Total (95% CI)		470	100.0	19.58 (12.02-27.14)

Heterogeneity: $\tau^2 = 0.0058$; $\chi^2_3 = 19.06$; $P = .002$; $I^2 = 74\%$

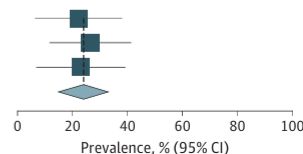


Size of boxes is proportional to weight of each study. Solid lines represent confidence interval for the prevalence value reported in each study. Dotted line represents the pooled estimate.

Figure 3. Forest Plot Showing Prevalence of Polycystic Ovary Syndrome (PCOS) in Patients With Pediatric Type 2 Diabetes in Studies Following PCOS Definition in Adolescence

Study	Diagnoses	Total	Weight, %	Prevalence (95% CI)
Balasanthiran et al, 2012 (UK) ⁴⁷	6	27	32.1	22.22 (6.54-37.90)
Shield et al, 2009 (UK and Republic of Ireland) ⁵⁰	9	34	26.6	26.47 (11.64-41.30)
Zdravkovic et al, 2004 (Canada) ⁴⁹	6	26	30.7	23.08 (6.88-39.27)
Total (95% CI)		87	100.0	24.04 (15.07-33.01)

Heterogeneity: $\tau^2 = 0$; $\chi^2_2 = 0.17$; $P = .92$; $I^2 = 0\%$



Età alla diagnosi di diabete:
12,9-16,1 anni

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PCOS e Diabete mellito di tipo 2

Endocrine (2021) 74:245–253

<https://doi.org/10.1007/s12020-021-02801-2>

META- ANALYSIS

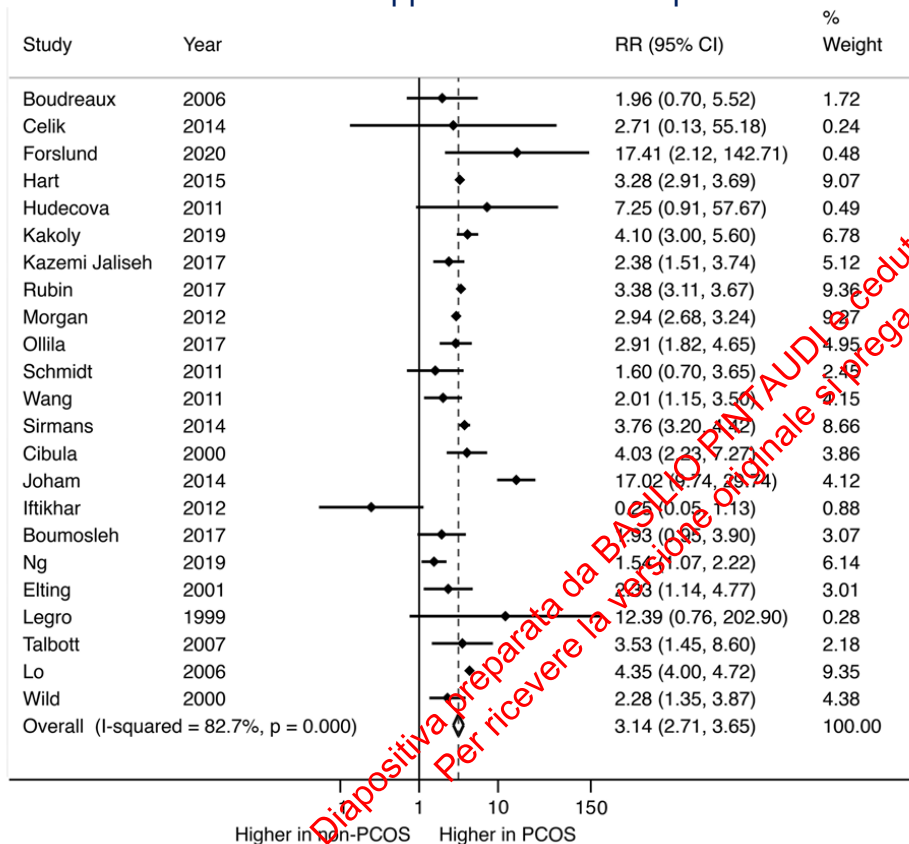
Risk of type 2 diabetes mellitus in polycystic ovary syndrome is associated with obesity: a meta-analysis of observational studies

Panagiotis Anagnostis¹  • Rodis D. Paparodis² • Julia K. Bosdou³ • Christina Bothou⁴ • Djuro Macut⁵ • Dimitrios G. Goulis¹ • Sarantis Livadas⁶

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PCOS e Diabete mellito di tipo 2

Rischio di sviluppare il Diabete di tipo 2



Endocrine (2021) 62:249–253
https://doi.org/10.1007/s12020-020-02006-2

META-ANALYSIS

Risk of type 2 diabetes mellitus in polycystic ovary syndrome is associated with obesity: a meta-analysis of observational studies

Georgios Anagnostis¹ · Rodis D. Paparodis² · Julia K. Bosdou³ · Christina Bothou⁴ · Djuro Macut⁵ · Dimitrios G. Goulis¹ · Sarantis Livadas⁶

The direction or the magnitude of the effect remained significant when the analysis was restricted to studies including participants matched for **age** (n = 13; RR 3.57, 95% CI 3.07–4.14) or to studies including only **premenopausal** women (n=11; RR 3.68, 95% CI 2.93–4.62)

PCOS e Diabete mellito di tipo 2

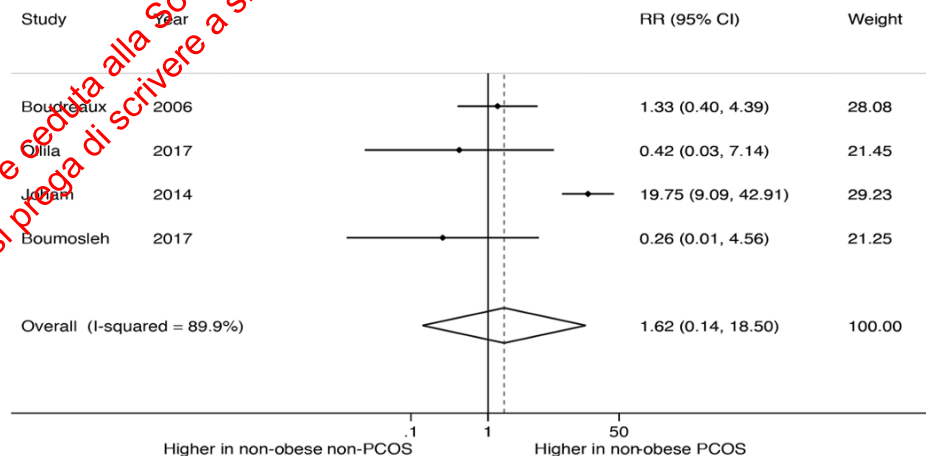
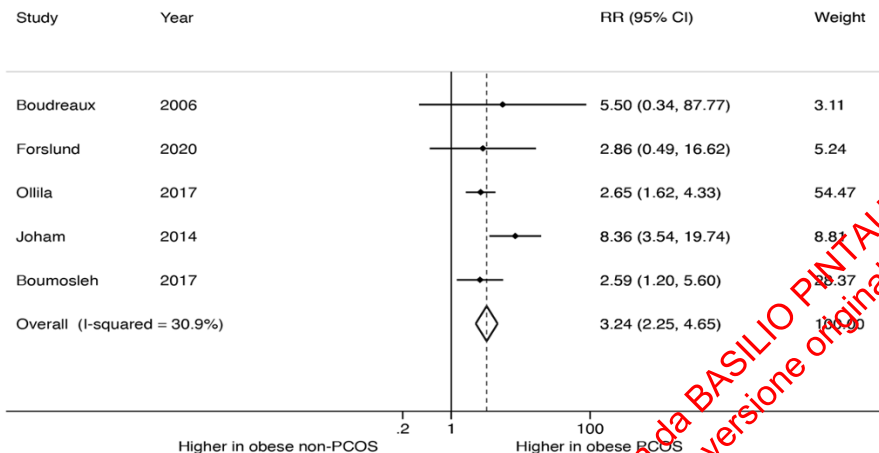
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Quale il ruolo dell'obesità?



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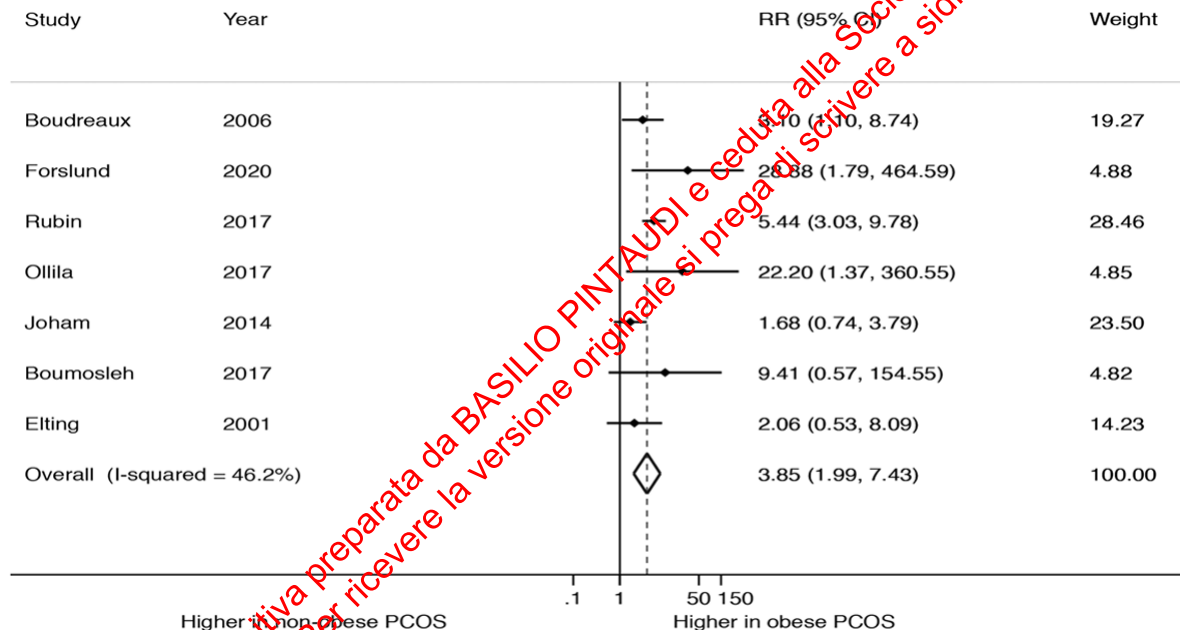
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Diabetes mellitus and insulin resistance in mothers, fathers, sisters, and brothers of women with polycystic ovary syndrome: a systematic review and meta-analysis

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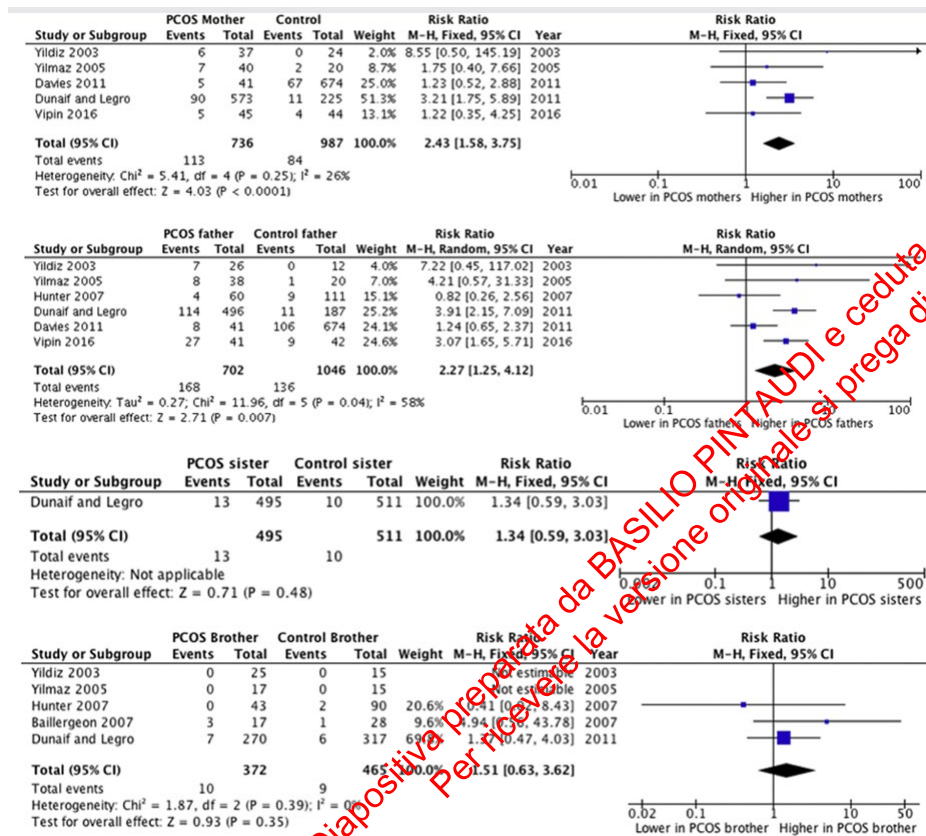
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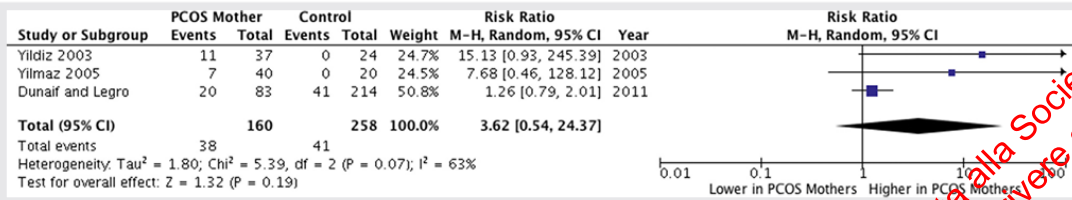
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Rischio di diabete tipo 2



PCOS e Diabete mellito di tipo 2

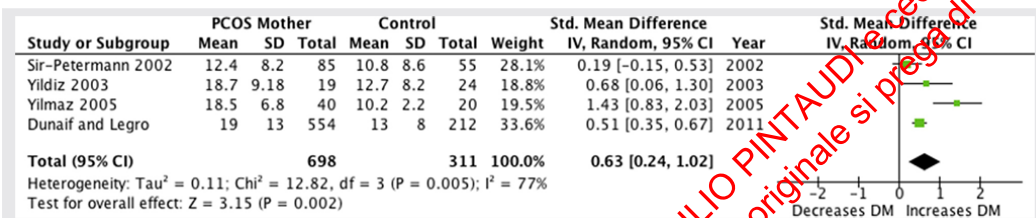
Mother



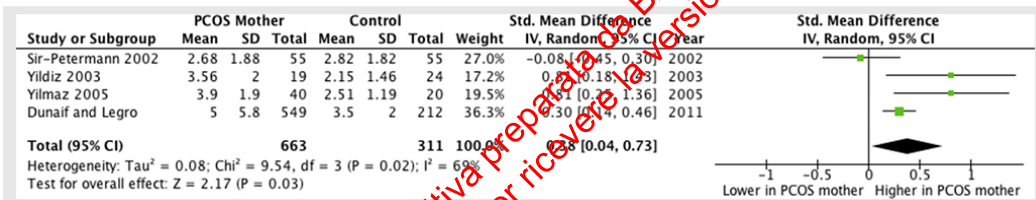
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Impaired Glucose Tolerance



Fasting insulin

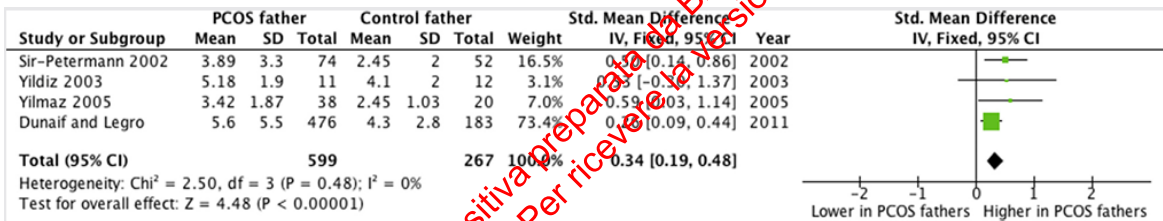
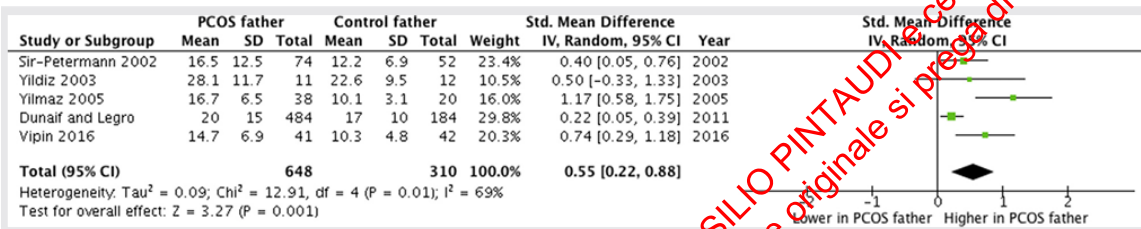
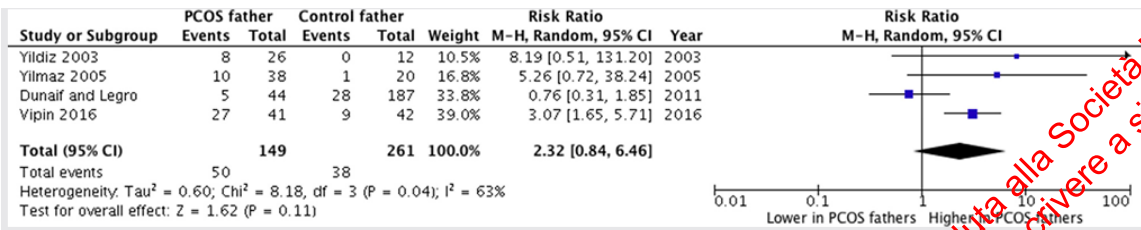


HOMA-IR

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PCOS e Diabete mellito di tipo 2

Father



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Impaired Glucose Tolerance

Fasting insulin

HOMA-IR

Manifestazioni cliniche dell'insulino resistenza

- ✓ Alterazioni minori della glicemia
- ✓ Diabete mellito
- ✓ **Sindrome metabolica**
- ✓ Diabete gestazionale

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PCOS e Sindrome Metabolica

Criteri	Valore
Circonferenza della vita (cm)	≥ 102 (≥ 40) per gli uomini ≥ 88 (≥ 35) per le donne
Glicemia a digiuno (mg/dL [mmol/L])	≥ 100 ($\geq 5,6$)
Pressione arteriosa (mmHg)	$\geq 130/85$
Trigliceridi, a digiuno (mg/dL [mmol/L])	≥ 150 ($\geq 1,7$)
Colesterolo lipoproteine ad alta densità (HDL) (mg/dL [mmol/L])	< 40 ($< 1,04$) per gli uomini < 50 ($< 1,29$) per le donne
*Almeno 3 criteri devono essere presenti per formulare diagnosi.	

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PCOS e Sindrome Metabolica

Diabetes & Metabolic Syndrome: Clinical Research & Reviews 13 (2019) 1481–1488



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Review

The association between metabolic syndrome and polycystic ovary syndrome: A systematic review and meta-analysis

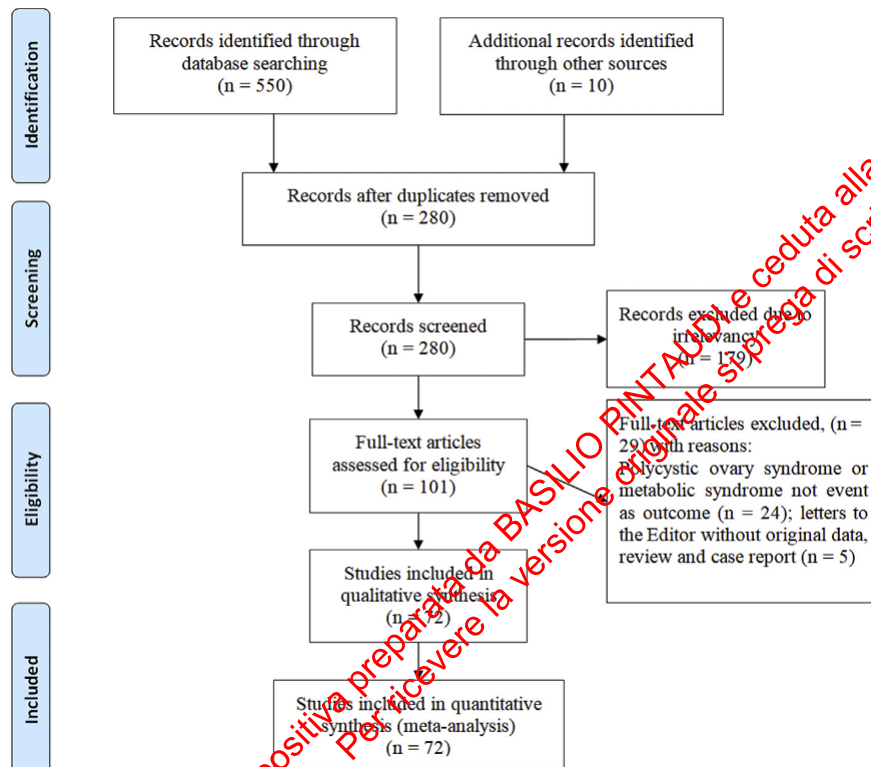
Masoumeh Otaghi ^a, Milad Azami ^b, Ali Khorsandi ^b, Milad Borji ^c, Zainab Tardeh ^{b,*}



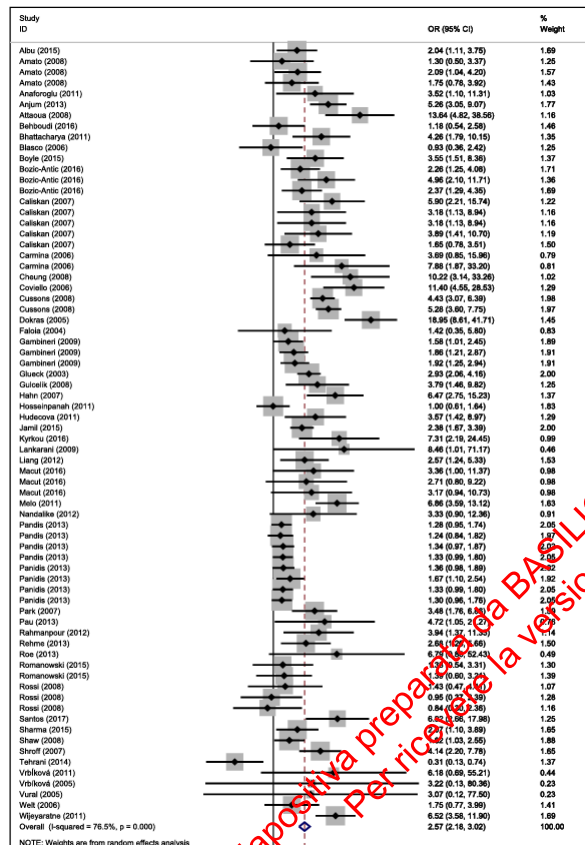
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PCOS e Sindrome Metabolica

M. Otaghi et al. / Diabetes & Metabolic Syndrome: Clinical Research & Reviews 13 (2019) 1481–1489



PCOS e Sindrome Metabolica



Diabetes & Metabolic Syndrome: Clinical Research & Reviews 13 (2019) 1481–1489



Diabetes & Metabolic Syndrome: Clinical Research & Reviews

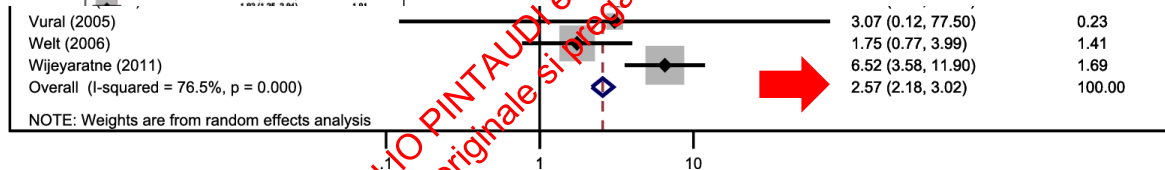
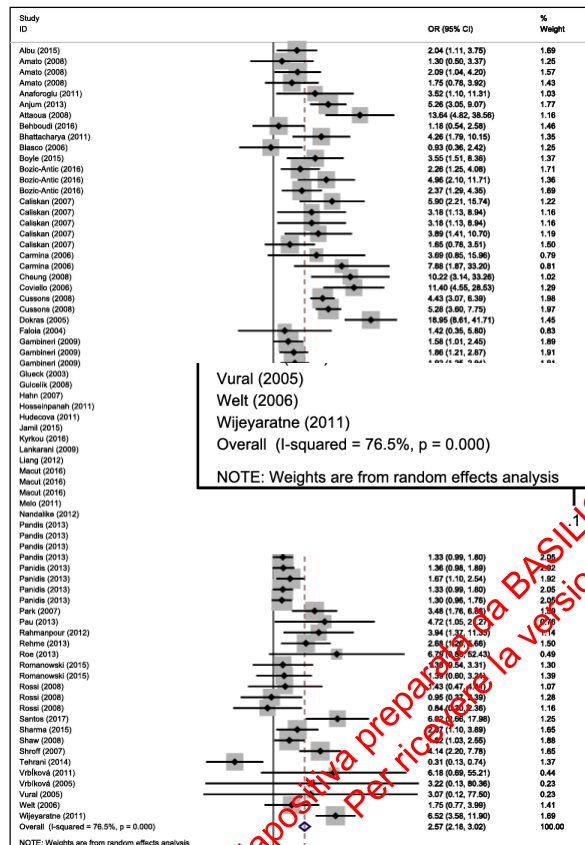
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Review

The association between metabolic syndrome and polycystic ovary syndrome: A systematic review and meta-analysis

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PCOS e Sindrome Metabolica



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Diabetes & Metabolic Syndrome: Clinical Research & Reviews

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Review

The association between metabolic syndrome and polycystic ovary syndrome: A systematic review and meta-analysis

Masoumeh Otaghi^a, Milad Azami^b, Ali Khorshidi^c, Milad Borji^c, Zainab Tardeh^{b, *}

Meta-analysis of studies on the association between metabolic syndrome and polycystic ovary syndrome according to metabolic syndrome diagnostic criteria.

Diagnostic criteria	IDF ^a	JSS ^b	COOK	NCEP-ATPIII ^c	AHA/NHLBI ^d	WHO ^e	JIS ^f
Studies (n)	16	2	2	34	5	3	7
OR ^g	2.41	2.80	2.08	3.93	1.44	8.10	1.43
95%CI ^h	1.75–3.31	0.47–16.58	0.29–14.99	2.51–3.90	1.18–1.74	2.51–26.11	0.95–2.15
I ^b	73.3%	87.9%	69.1%	69.1%	0%	72.7%	75.5%

^a IDF: International diabetes foundation.

^b JSS: Joint scientific statement.

^c NCEP ATP III: The national cholesterol education program adult Treatment panel.

^d AHA/NHLBI: American Heart Association and the National Heart, Lung and Blood Institute.

^e WHO: World health organization.

^f JIS: Joint interim statement.

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PCOS e Sindrome Metabolica negli adolescenti

Reproductive Sciences (2023) 30:28–40
<https://doi.org/10.1007/s43032-022-00864-8>

REVIEW

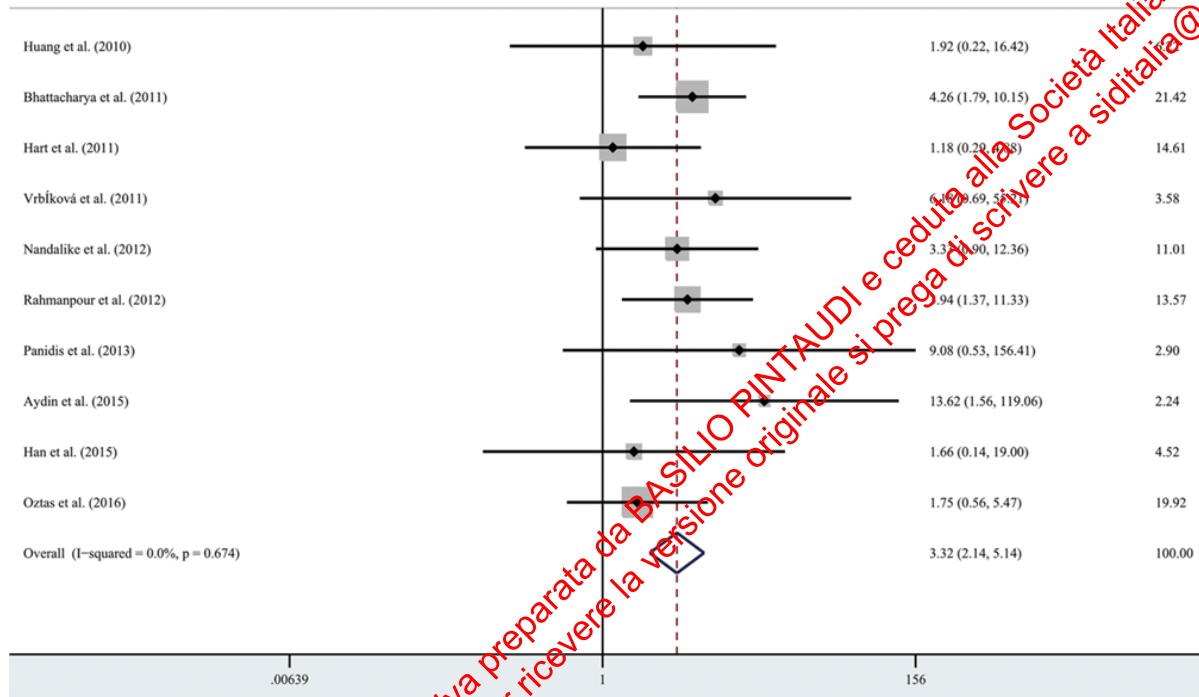
The Association Between Polycystic Ovary Syndrome and Metabolic Syndrome in Adolescents: a Systematic Review and Meta-analysis

Leyi Fu¹  · Ningning Xie¹  · Fan Qu¹  · Jue Zhou²  · Fangfang Wang¹ 

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PCOS e Sindrome Metabolica negli adolescenti

Rischio di sviluppare la Sindrome Metabolica



Non-PCOS

PCOS

Reproductive Sciences (2023) 30:26–40
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REVIEW

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Leyi Fu¹ · Ningning Xie¹ · Fan Qu¹ · Jue Zhou² · Fangfang Wang¹

PCOS e Sindrome Metabolica negli adolescenti

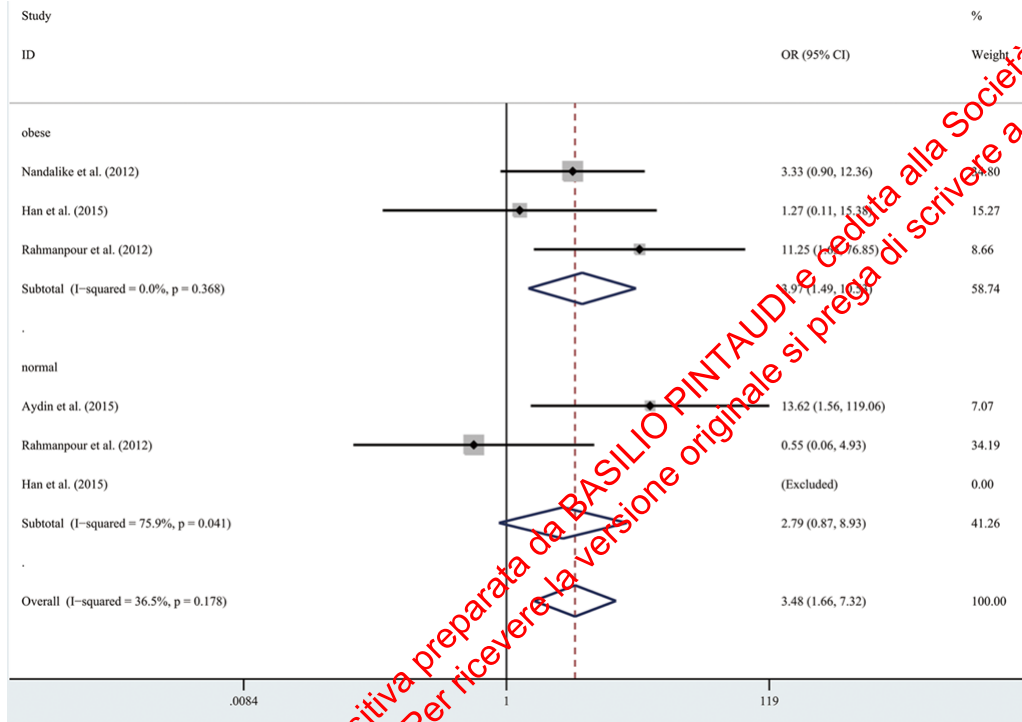
Il ruolo dell'obesità

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REVIEW

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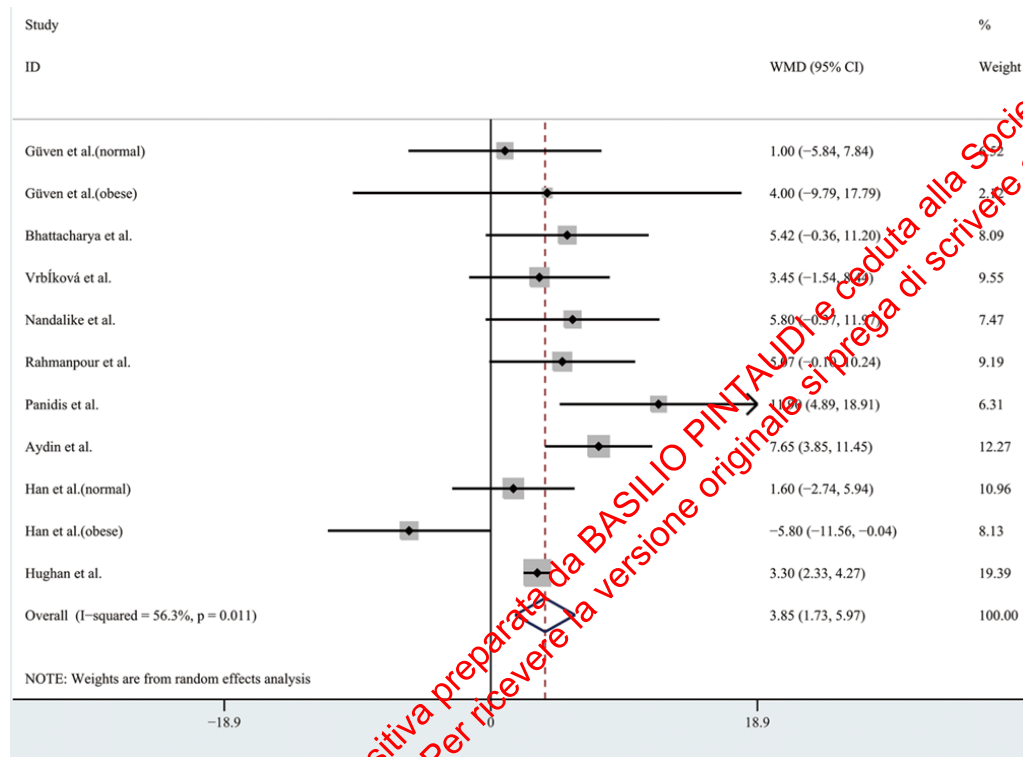


Non-PCOS

PCOS

PCOS e Sindrome Metabolica negli adolescenti

Pressione arteriosa sistolica



Non-PCOS

PCOS

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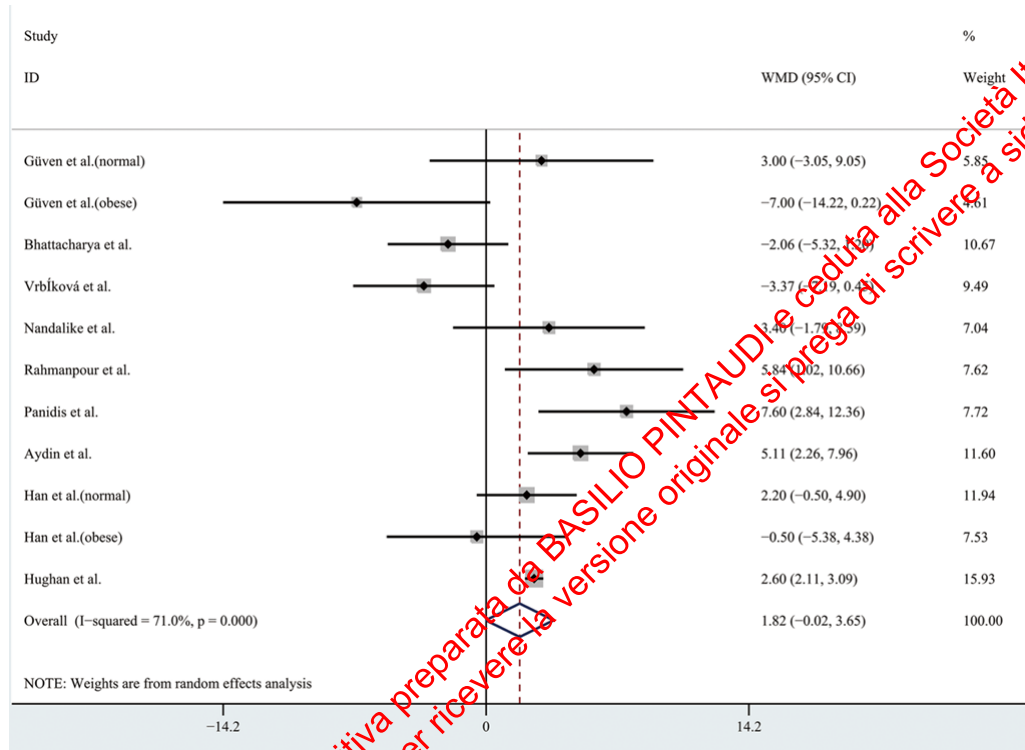
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PCOS e Sindrome Metabolica negli adolescenti

Pressione arteriosa diastolica



Non-PCOS

PCOS

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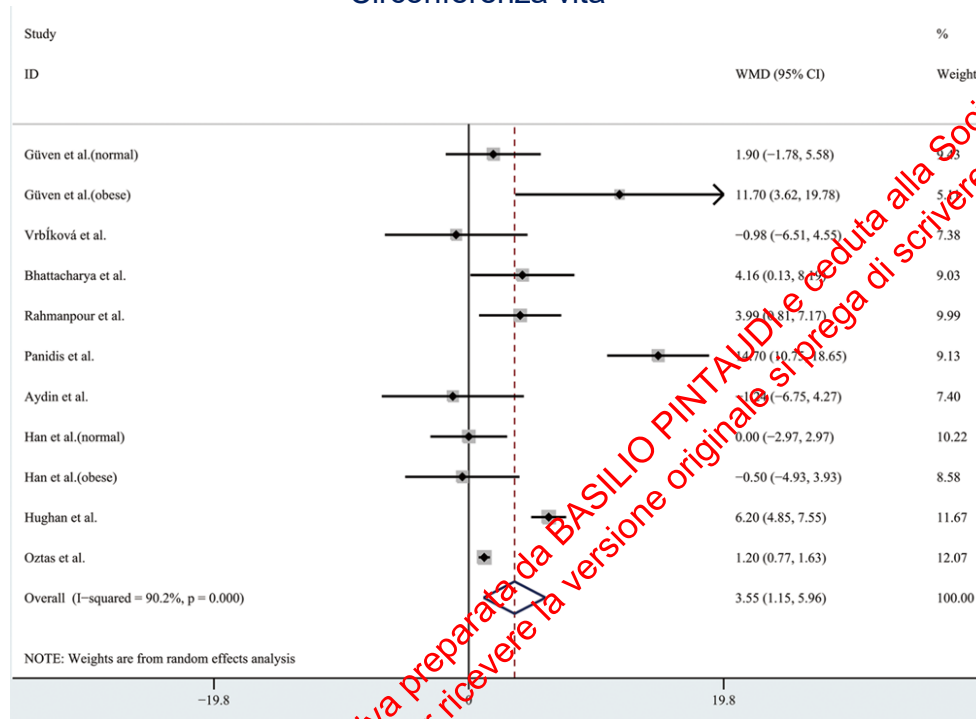
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Leyi Fu¹ · Ningning Xie¹ · Fan Qu¹ · Jue Zhou² · Fangfang Wang¹

PCOS e Sindrome Metabolica negli adolescenti

Circonferenza vita



Non-PCOS

PCOS

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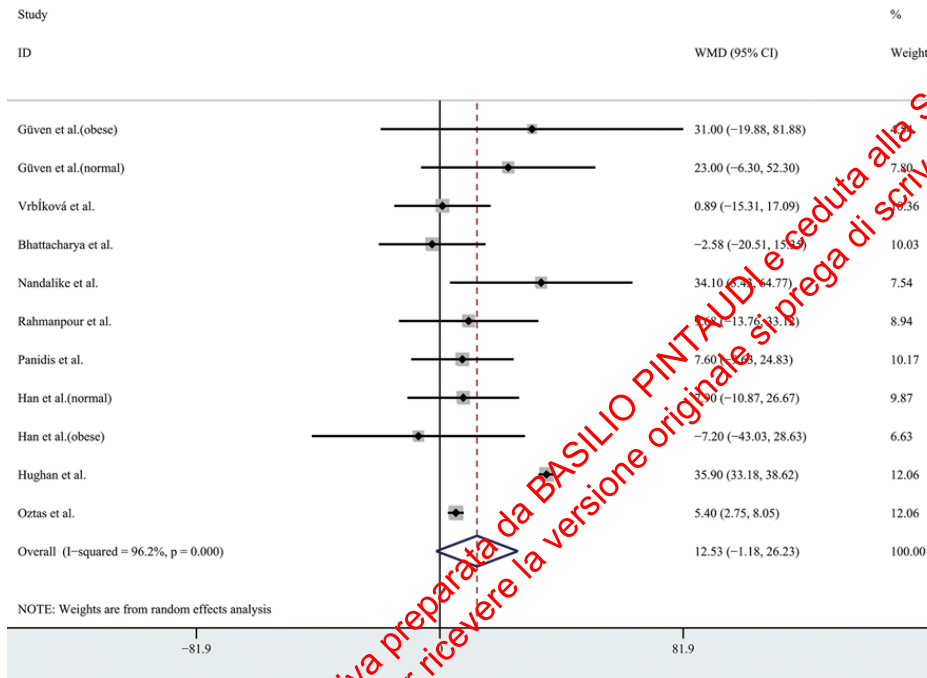
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Leyi Fu¹ · Ningning Xie¹ · Fan Qu¹ · Jue Zhou² · Fangfang Wang¹

PCOS e Sindrome Metabolica negli adolescenti

Trigliceridi



Non-PCOS

PCOS

Reproductive Sciences (2023) 30:28–40
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REVIEW

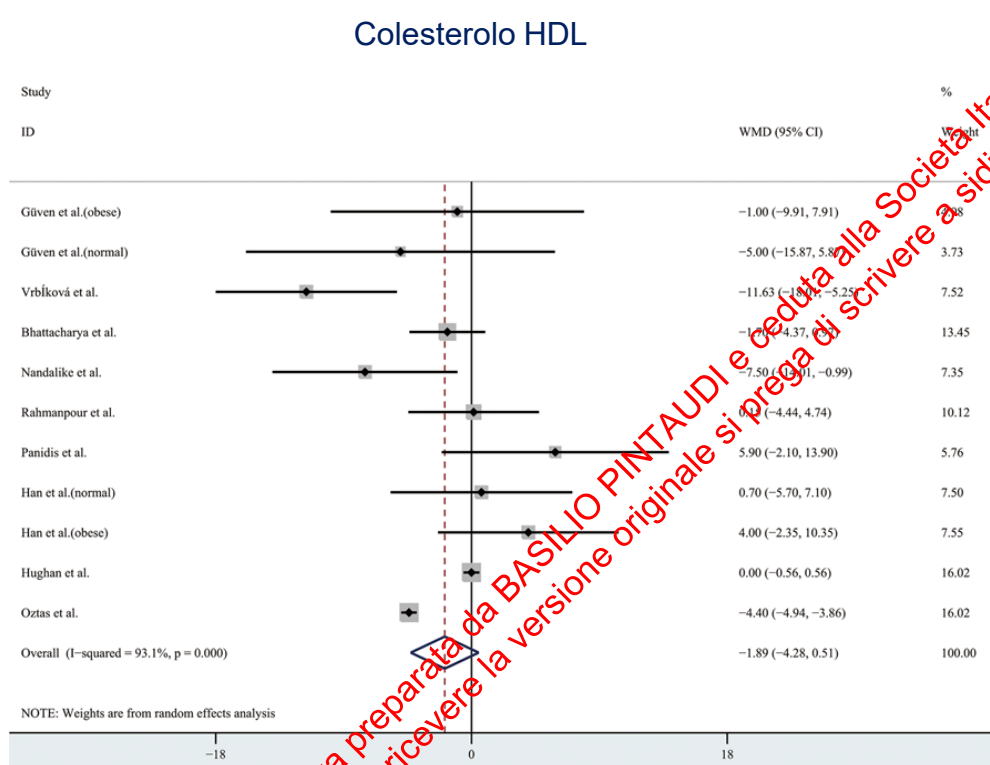
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PCOS e Sindrome Metabolica negli adolescenti

Colesterolo HDL



Non-PCOS

PCOS

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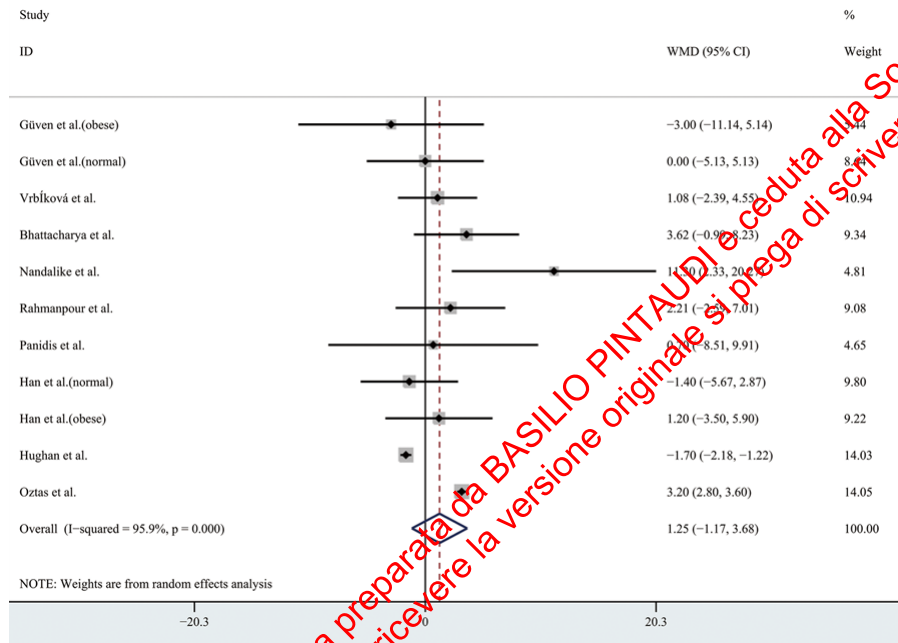
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Leyi Fu¹ · Ningning Xie¹ · Fan Qu¹ · Jue Zhou² · Fangfang Wang¹

PCOS e Sindrome Metabolica negli adolescenti

Glicemia a digiuno



Non-PCOS

PCOS

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REVIEW

The Association Between Polycystic Ovary Syndrome and Metabolic Syndrome in Adolescents: a Systematic Review and Meta-analysis

Leyi Fu¹ · Ningning Xie¹ · Fan Qu¹ · Jue Zhou² · Fangfang Wang¹

Manifestazioni cliniche dell'insulino resistenza

- ✓ Alterazioni minori della glicemia
- ✓ Diabete mellito
- ✓ Sindrome metabolica
- ✓ **Diabete gestazionale**

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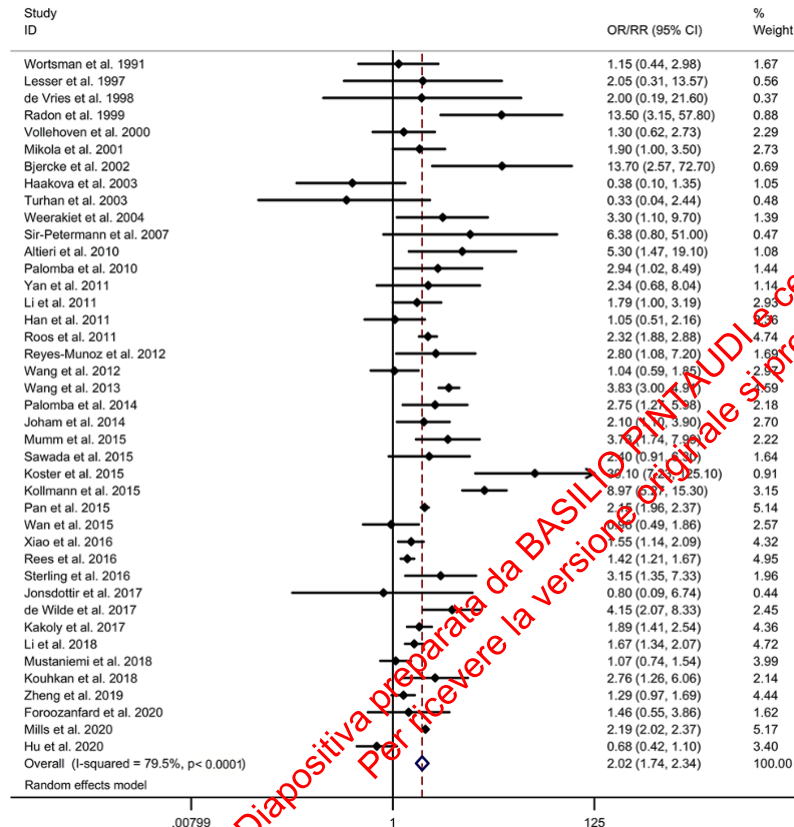
Association between Polycystic Ovarian Syndrome and Risk of Gestational Diabetes Mellitus: A Meta-Analysis

Yu Qiu Xueqin Zhang Yan Ni

Department of Obstetrics, Women and Children's Hospital, School of Medicine, Xiamen University, Xiamen, China

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PCOS e Diabete Gestazionale



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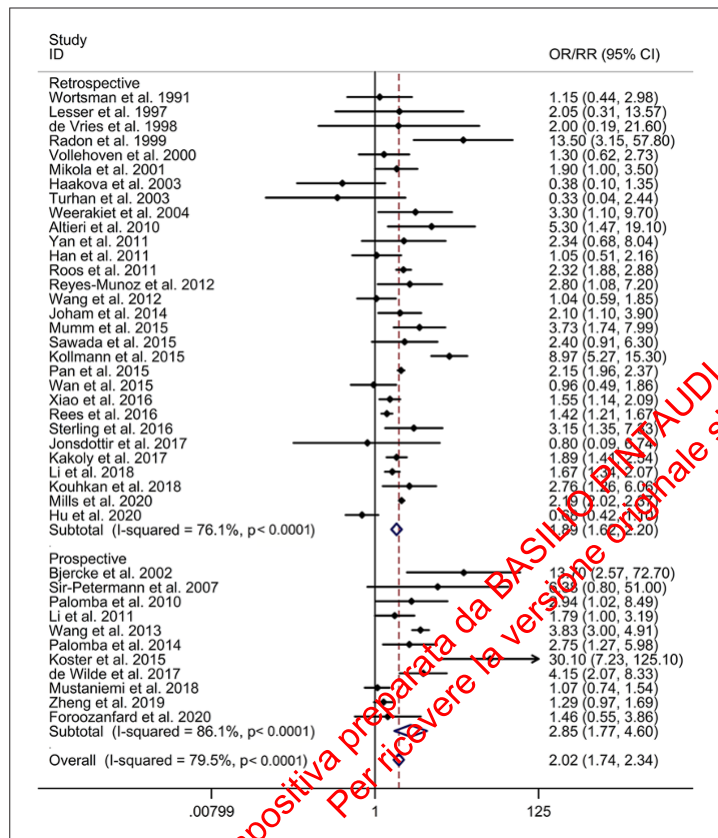
Department of Obstetrics, Women and Children's Hospital, School of Medicine, Xiamen University, Xiamen, China

Rischio di Diabete gestazionale

OR 2,02 (95%CI 1,74-2,34)

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PCOS e Diabete Gestazionale



Association between Polycystic Ovarian Syndrome and Risk of Gestational Diabetes Mellitus: A Meta-Analysis

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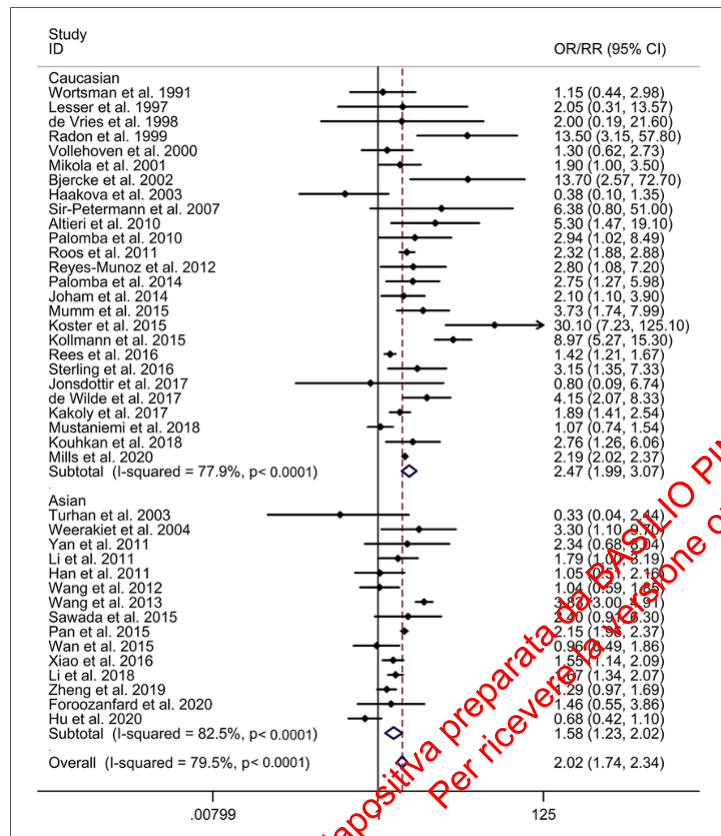
Subgroup analysis per tipologia di studio

PCOS e Diabete Gestazionale

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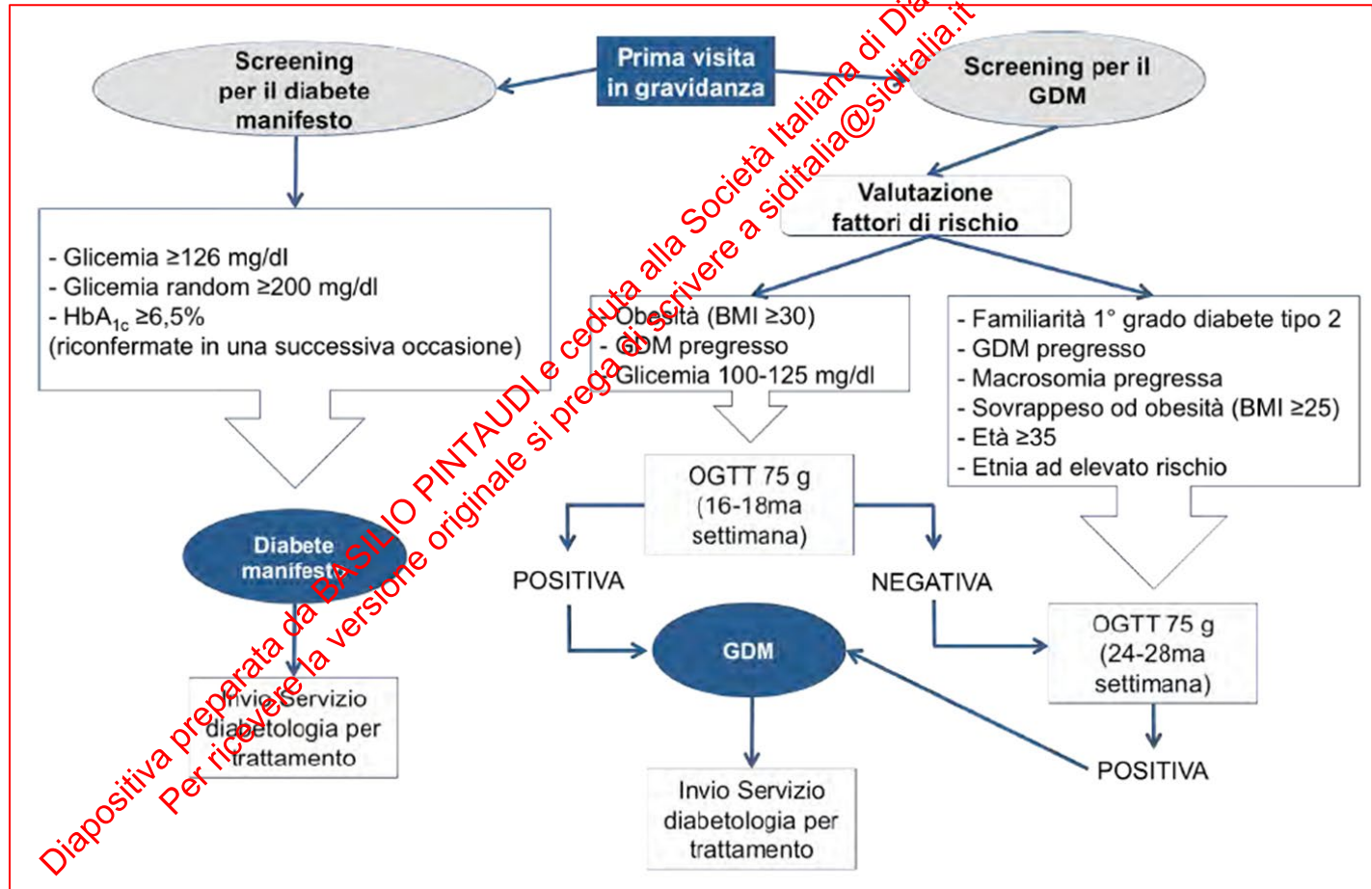
Department of Obstetrics, Women and Children's Hospital, School of Medicine, Xiamen University, Xiamen, China



Subgroup analysis per etnia

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PCOS e Diabete Gestazionale



European Journal of Endocrinology, 2023, 189, G43–G64
<https://doi.org/10.1093/ejendo/lvad096>
Advance access publication 15 August 2023
Clinical Practice Guideline



Recommendations from the 2023 international evidence-based guideline for the assessment and management of polycystic ovary syndrome

Helena J. Teede,^{1,2,*}  Chau Thien Tay,^{1,2} Joop J.E. Laven,^{2,3} Anuja Dokras,⁴ Lisa J. Moran,^{1,2} Terhi T. Piltonen,⁵  Michael F. Costello,^{2,6} Jacky Boivin,⁷  Leanne M. Redman,⁸ Jacqueline A. Boyle,^{2,9} Robert J. Norman,^{2,10} Aya Mousa,¹  and Anju E. Joham^{1,2} on behalf of the International PCOS Network[†]

Diapositiva preparata da BASILIO PINTAUDIPresentata alla Società Italiana di Diabetologia.
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Recommendations from the 2023 international evidence-based guideline for the assessment and management of polycystic ovary syndrome

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1.9		Impaired glucose tolerance and type 2 diabetes risk	
1.9.1	EBR	Healthcare professionals and women with PCOS should be aware that, regardless of age and BMI, women with PCOS have an increased risk of impaired fasting glucose, impaired glucose tolerance, and type 2 diabetes.	◆◆◆◆ ⊕⊕○○
1.9.2	EBR	Glycaemic status should be assessed at diagnosis in all adults and adolescents with PCOS.	◆◆◆◆ ⊕⊕○○
1.9.3	CR	Glycaemic status should be reassessed every 1-3 years, based on additional individual risk factors for diabetes.	◆◆◆◆
1.9.4	CR	Healthcare professionals, women with PCOS, and other stakeholders should prioritize preventative strategies to reduce type 2 diabetes risk.	◆◆◆◆
1.9.5	CR	Funding bodies should recognize that PCOS is highly prevalent, has significantly higher risk for diabetes, and should be funded accordingly.	◆◆◆◆
1.9.6	CR	Diabetes general population guidelines should consider the inclusion of PCOS as an independent risk factor for diabetes.	◆◆◆◆
1.9.7	PP	Healthcare professionals, adults, and adolescents with PCOS and their first-degree relatives should be aware of the increased risk of diabetes and the need for regular glycaemic assessment.	
1.9.8	PP	Women with type 1 and type 2 diabetes have an increased risk of PCOS, and screening should be considered in individuals with diabetes.	

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Recommendations from the 2023 international evidence-based guideline for the assessment and management of polycystic ovary syndrome

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Glycaemic testing

1.9.9	EBR	Healthcare professionals and women with PCOS should recommend the 75-g oral glucose tolerance test (OGTT) as the most accurate test to assess glycaemic status in PCOS, regardless of BMI.	◆◆◆◆ ⊕○○○
1.9.10	EBR	If an OGTT cannot be performed, fasting plasma glucose and/or glycated haemoglobin (HbA1c) could be considered, noting significantly reduced accuracy.	◆◆◆◆ ⊕○○○
1.9.11	EBR	An OGTT should be considered in all women with PCOS and without pre-existing diabetes, when planning pregnancy or seeking fertility treatment, given the high risk of hyperglycaemia and the associated comorbidities in pregnancy. If not performed preconception, an OGTT could be offered at the first prenatal visit and all women with PCOS should be offered the test at 24–28 weeks gestation.	◆◆◆◆ ⊕○○○
1.9.12	PP	Insulin resistance is a pathophysiological factor in PCOS; however, clinically available insulin assays are of limited clinical relevance and are not recommended in routine care (refer to 3.1.10).	

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From Prediabetes to Type 2 Diabetes Mellitus in Women with Polycystic Ovary Syndrome: Lifestyle and Pharmacological Management

Arianna Pani,¹ Ilaria Gironi,² Giacomina Di Vieste,³ Elena Mion,⁴ Federico Bertuzzi,⁴
and Basilio Pintaudi ⁴

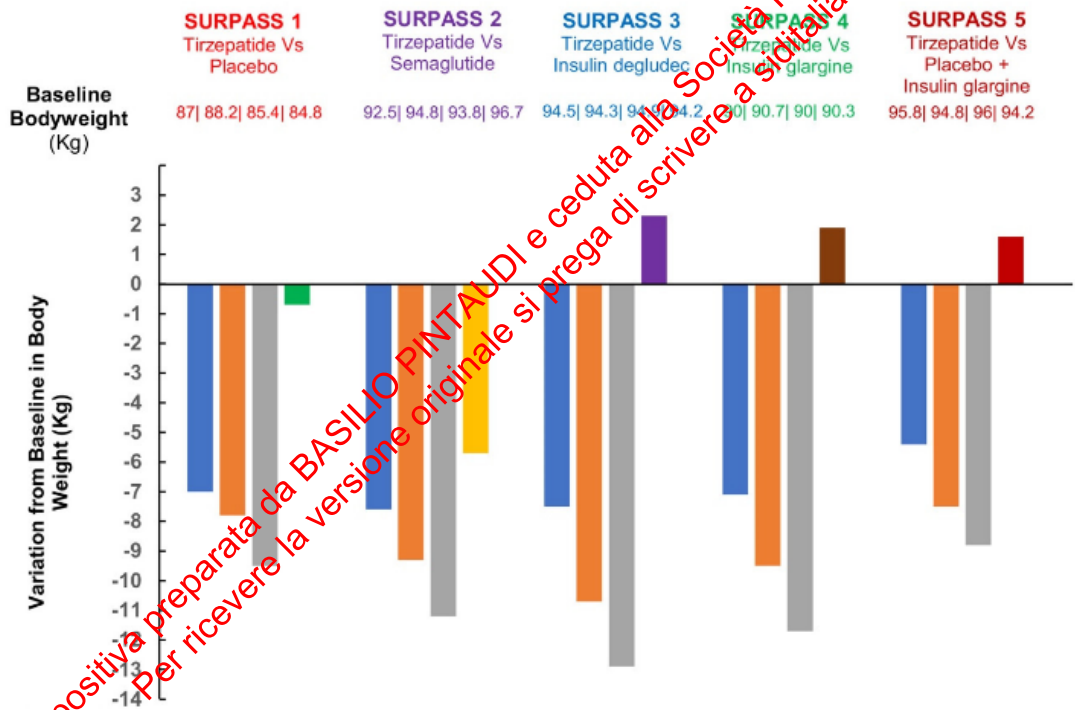
TABLE 1: Effect of different treatments on impaired glucose tolerance and impaired fasting glucose in women with polycystic ovary syndrome.

Intervention	Impaired glucose tolerance (IGT)	Impaired fasting glucose (IFG)
Lifestyle modifications	Improved (28, 29, 33, 34)	Improved (28, 29, 33, 34)
Metformin	(i) Improvement in 2-hour glucose levels at the OGTT (46, 47) (ii) Reversion from IGT to normal glucose tolerance (47)	Reduction in fasting glucose levels compared to placebo (42)
Thiazolidinediones	Reversion from IGT to normal glucose tolerance (60)	Reduction in fasting glucose levels compared to placebo (58)
SGLT2i	Neutral effect (60)	Neutral effect (61)
GLP-1 RA	Improved with the combination of liraglutide and metformin (62)	Improved with the combination of liraglutide and metformin (62)
DPP4i	Improved with the combination of saxagliptin and metformin (63)	Improved with the combination of saxagliptin and metformin (63)
Inositol	Improved (78)	Improved (78)

The Potential Utility of Tirzepatide for the Management of Polycystic Ovary Syndrome

Alekya Devi Anala ^{1,†}, Insiya Sajjad Hussain Saifudeen ^{1,†}, Maryam Ibrahim ^{1,†}, Moksha Nanda ^{1,†}, Nida Naaz ^{1,†} and Stephen L. Atkin ^{*}

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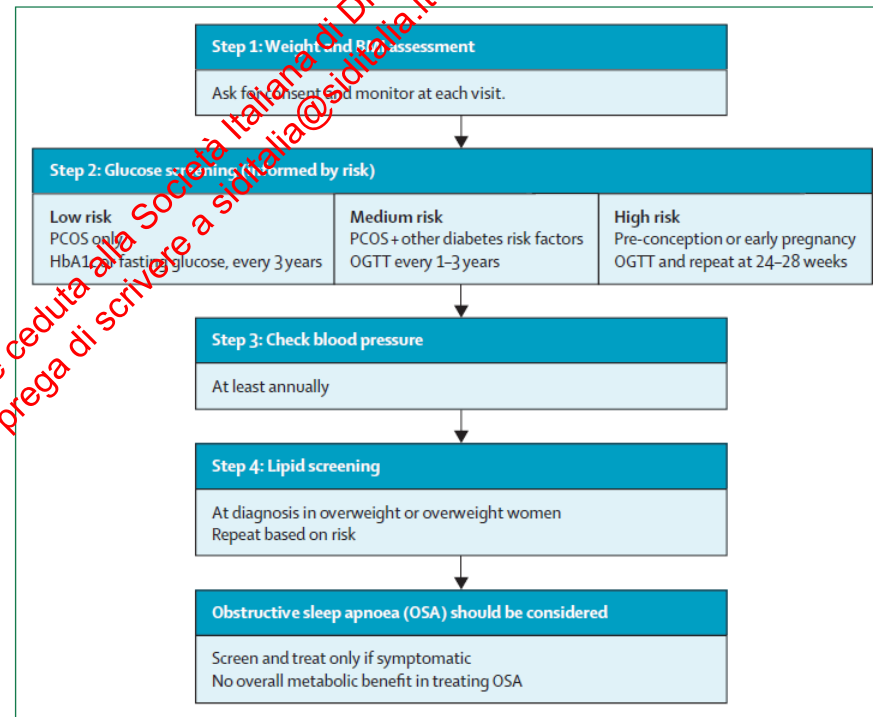


Polycystic ovary syndrome

Anju E Joham, Robert J Norman, Elisabet Stener-Victorin, Richard S Legro, Stephen Franks, Lisa J Moran, Jacqueline Boyle, Helena J Teede

1990 NIH criteria				
2003 Rotterdam criteria ¹¹ endorsed by NIH ¹⁰ and international evidence-based PCOS guidelines				
	Phenotype A	Phenotype B	Phenotype C	Phenotype D
Hyperandrogenism				
Ovulatory dysfunction				
PCOM				

Figure 3: PCOS diagnostic criteria and phenotypes

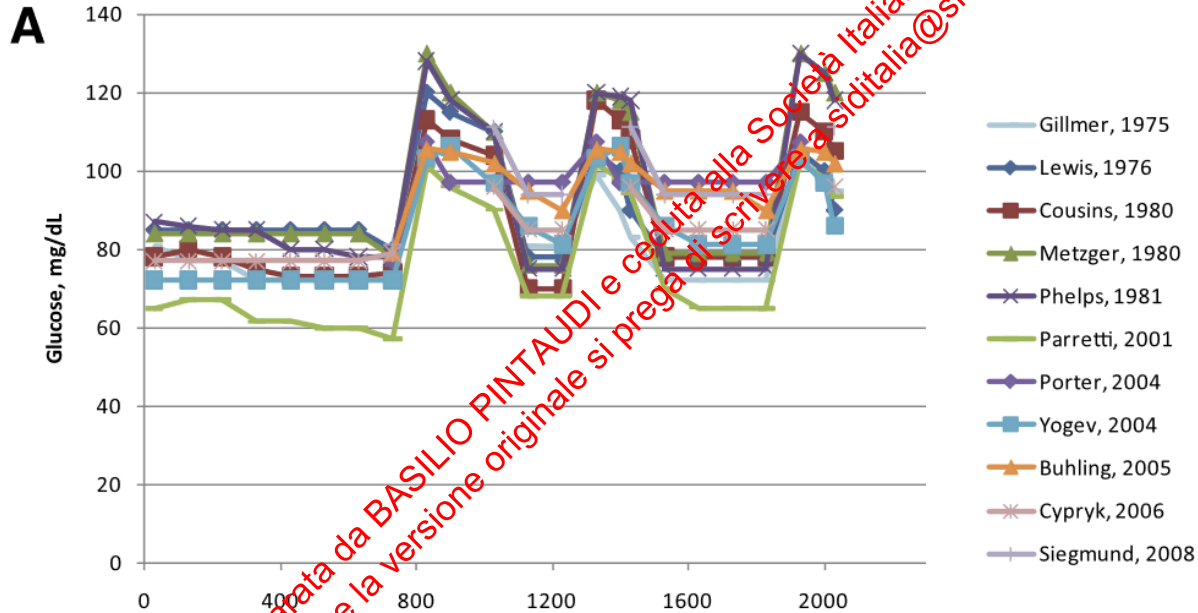




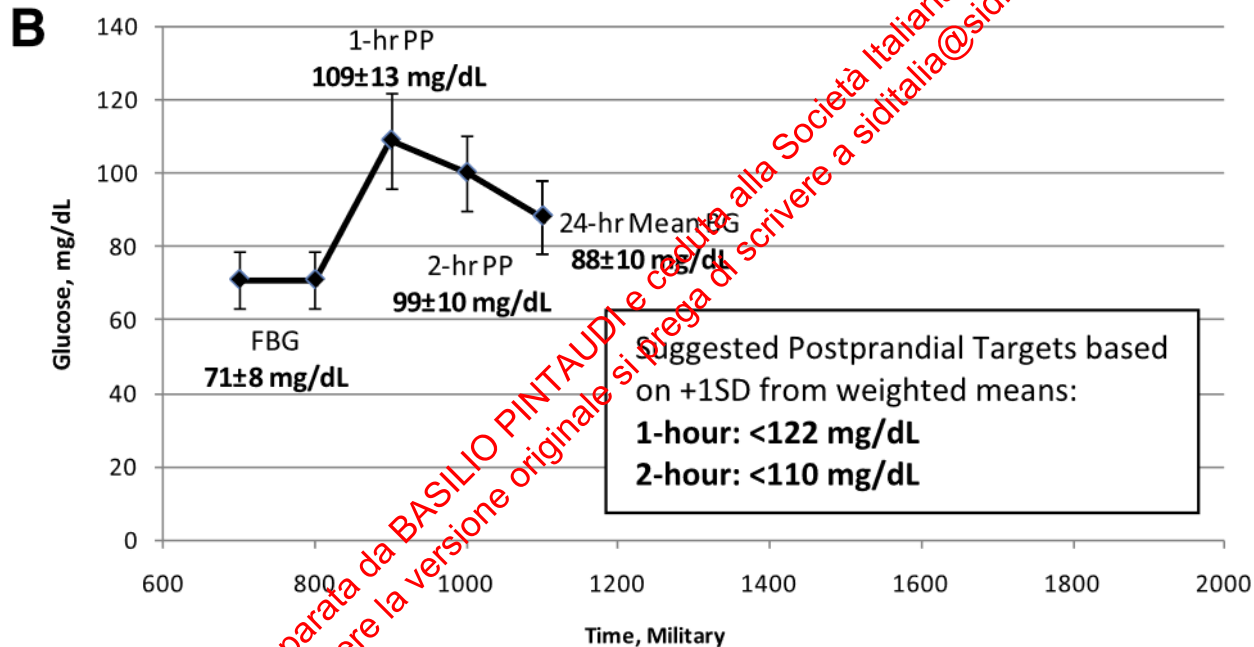
Grazie per l'attenzione

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Patterns of Glycemia in Normal Pregnancy



Patterns of Glycemia in Normal Pregnancy



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