

Ottobre/Novembre 2021

L'ATTIVITÀ FISICA COME “FARMACO”

IL COUNSELLING MOTIVAZIONALE BREVE E LE POSSIBILI RISPOSTE PER I BISOGNI DEI DESTINATARI

«Movimento per la salute»:

un progetto di collaborazione fra MMG e Operatori di fitness Metabolica

Davide Violi

Associazione Fitness Metabolica



- Far interagire l'universo Diabetologico con il Mondo del Fitness
- Elaborare un Protocollo di esercizio fisico per pazienti diabetici
- Formare le professionalità adeguate, [Operatori di Fitness Metabolica](http://www.metabolicfitness.it) (OFM) in grado di sviluppare e supervisionare l'esercizio fisico.
- Organizzare Centri Fitness Metabolica sul territorio.

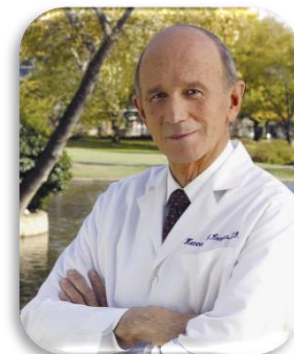
La ricerca sistematica sul rapporto tra Attività fisica e Salute inizia dopo il 1950



J. Morris



R. Paffenbarger



K.H. Cooper



S. Blair



R.J. Sigal



Coronary heart-disease and physical activity of work

Morris JN, Heady JA, Raffle PA, Roberts CG, Parks JW. Lancet. 1953

“Ad oggi, noi occidentali
rappresentiamo la prima generazione
della storia umana in cui gran parte
della popolazione *deve fare
deliberatamente esercizio* con
l’obiettivo di mantenersi in salute.”



Prof. Jeremy Morris



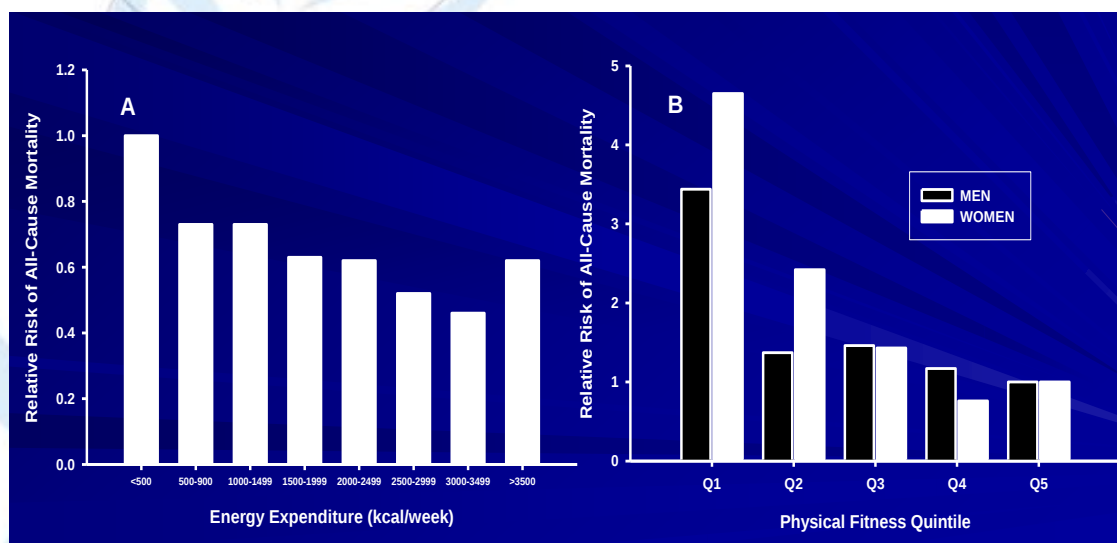
Property of Museum of History & Industry, Seattle

Work activity and fatal heart attack studied by multiple logistic risk analysis

Brand RJ, Paffenbarger RS Jr, Sholtz RI, Kampert JB. Am J Epidemiol. 1978

Harvard Alumni Study

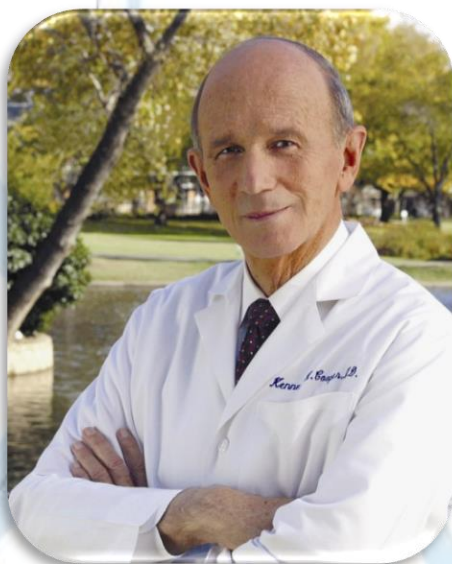
Si presta attenzione anche all'attività svolta nel tempo libero e non solo a quella lavorativa



Collegamento a effetto
Dose Risposta

Paffenbarger et. Al 1986. Physical Activity, all-cause mortality and longevity of college alumni. NEJM

Aerobic Center Longitudinal Study (ACLS)



Uno studio rivoluzionario: si valuta la Physical Fitness

Esame medico preventivo + un test massimale al treadmill

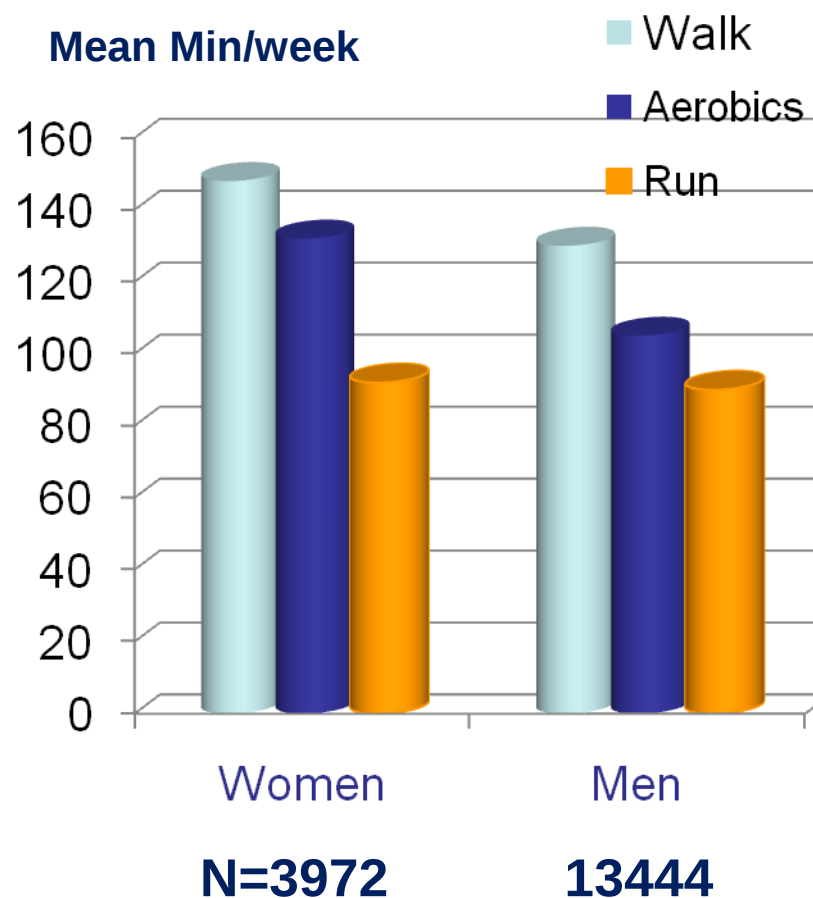
Relazione tra Mortalità per CVD e tutte le cause e categorie di CRF

Low fitness è un importante precursore di mortalità

Modificando il livello di CRF si riduce il rischio di mortalità

Volume di attività fisica eseguita da uomini e donne moderatamente attivi nell'ACLS

**Valutazione dell'attività fisica
mediante quesionari in soggetti
che avevano eseguito il test
massimale al treadmill**



La soluzione al problema?

“È nella cooperazione tra medici e coloro i quali sono coinvolti nella salute pubblica al fine di *motivare* e aiutare la popolazione *a diventare più attiva*”.

S. Blair



Linee guida 2004

Physical Activity/Exercise and Diabetes



Reviews/Commentaries/ADA Statements

Physical Activity/Exercise and Diabetes

Physical Activity/Exercise and Type 2 Diabetes

RONALD J. SIGAL, MD, MPH^{1,2,3}
GLENN P. KIRWAN, PhD^{1,3}DAVID H. WASSERMAN, PhD⁴
CARMIN CASTANEDA-SCOTTA, MD, PhD⁵in the *Manualbook of Exercise* and other review articles for additional details. The present review focuses on type 2 diabetes.

Per migliorare il controllo glicemico, supportare la perdita di peso e ridurre il rischio di patologie cardiovascolari è necessario accumulare almeno **150** minuti/settimana di attività fisica aerobica ad intensità moderata (**40–60% of VO₂max**) e/o almeno **90** minuti/settimana di attività aerobica vigorosa (**>60% of V O₂max**) distribuita in giorni diversi e senza lasciar passare più di tre giorni senza attività fisica. In assenza di controindicazioni eseguire esercizi di forza per tutti i principali gruppi muscolari con set di **8-10 ripetizioni**. Attività fisica dovrebbe essere distribuita su 3 giorni/week intervallati da non più di 2 giorni di pausa.

Italian Diabetes Exercise Study IDES

- Cosa è: Studio Clinico, Multicentrico, Nazionale
- A chi è rivolto: Pazienti Diabetici di tipo II con Sindrome Metabolica
- Qual è lo scopo: Valutare l'efficacia di modelli d'intervento rivolti al cambiamento degli stili di vita
- Con l'obiettivo di: Migliorare il controllo metabolico e ridurre i fattori di rischio cardiovascolare



Italian Diabetes Exercise Study **IDES**



Supportato da



Perché è stato importante lo studio IDES

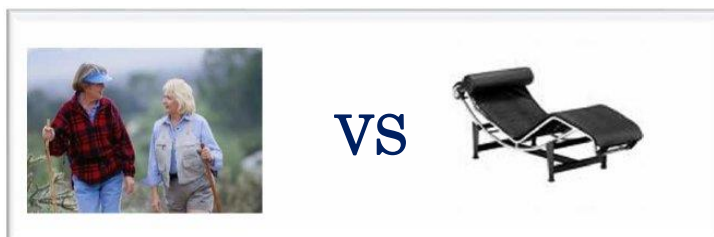


Table 1 Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
1. Type 2 diabetes and waist circumference above >94 cm (M), >80 cm (F); plus >1 other metabolic syndrome trait, as defined according to the IDF criteria ^a	1. All patients with a history of central nervous dysfunction such as hemiparesis, myelopathies, cerebral ataxia, significant musculoskeletal deformities such as an amputation, dysmetria, or scoliosis, patients with movement abnormalities or arthritis limited by pain when exercising
2. Diabetes duration >1 year	2. A history of clinical evidence of severe cardiovascular disease which may limit or be a contraindication for exercise
3. Age 40–75 years at screening	3. Clinical evidence of vestibular dysfunction
4. BMI 27–40 kg/m ²	4. Angina and related symptoms
5. Sedentary for at least 6 months ^b	5. Postural hypotension defined as a fall in arterial blood pressure when changing position of >20 mmHg (systole) or >10 mmHg (diastole)
6. They must have been treated by prescribed diet and/or OHA and insulin	6. History of plantar sores
7. Able to walk for long distances unaided	
8. Eligible after positive outcome of cardiac evaluation	

^a Triglycerides >150 mg/dl and/or HDL cholesterol <40 mg/dl (M), <50 mg/dl (F) or specific treatment; and blood pressure >130/85 mmHg or specific treatment.

^b Sedentary patients were defined: (1) those expending less than 10% of their leisure time expenditure in activities involving >4 MET; (2) those who did not practice any leisure time physical activity and who also were above the median in the number of hours spent sitting down during leisure time.



IDES INVESTIGATION LINES

Clinical

Primary goal

- HbA_{1c} reduction

Secondary goal

- TG reduction
- LDL reduction
- HDL increase
- BP reduction
- WC reduction

Metabolic Targets achievement

- European guidelines

Non traditional risk factors

Ex. Physiology

Physical Activity

- METs .h-1.w-1

Exercise

- V02 max
- Leg strength
- Pectorals Strength
- Lateral Strength
- Flexybility

Psychological

Well Being

- ISF-36

Treatment satisfaction

- WHTO-DTSQ

Economical

- Drugs reduction

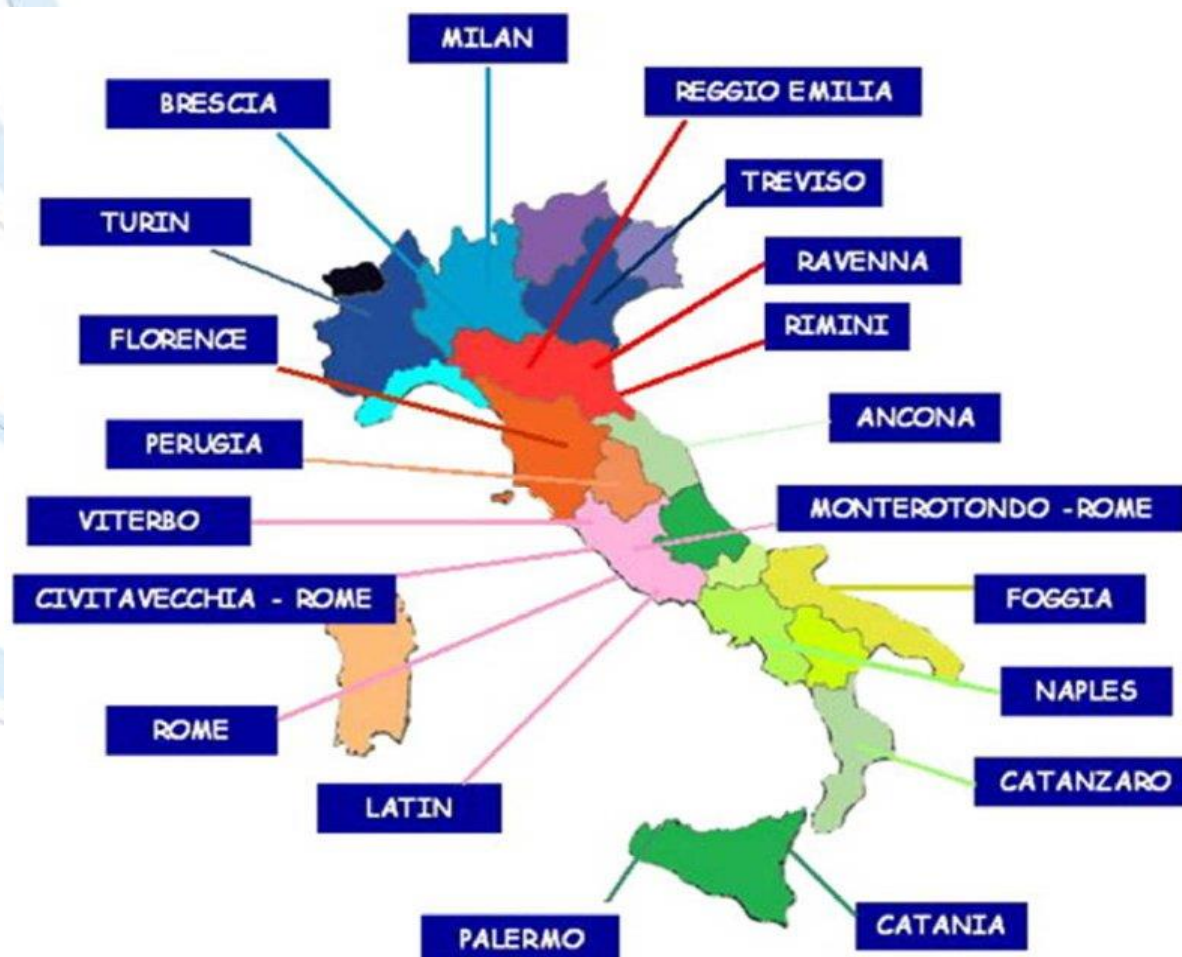
Inflammation: hs-Creative protein, interleukin (IL-1a, 1b, 2, 4, 6, 8, 10) and tumnor necrosis factor- (TNF-a).

Oxidative stress

Endothelial disfunction

Prothrombotic state

IDES Study

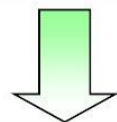


Experimental Groups

Group EXE (Exercise Group)

n = 303

mixed exercise program,
prescribed and supervised
in addition to standard care



150 min/wk in 2 sessions

Aerobic 55-70% of VO_{2max}
(Treadmill and/or Bicycle)

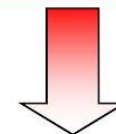
Resistance 60-80% of 1RM
(4 resistance exercises)

(i.e. thrust movement on the transverse
plane, traction movement on the frontal
plane, squat movement, trunk flexion for the
abdominals) 3 stretching positions.

Group CON (Control Group)

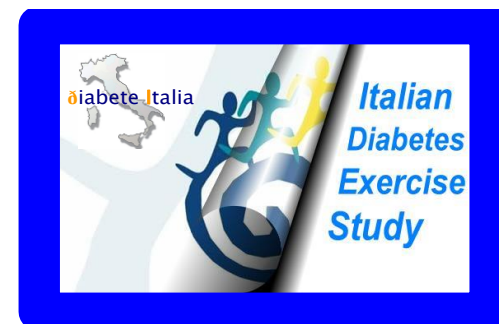
n = 303

standard care
(including structured
exercise counseling)



mainly
Aerobic
Physical activity

12
Months



BRESCIA

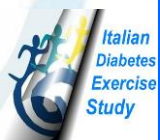
CENTRO DIABETOLOGIA

UO Diabetologia
Spedali Riuniti di Brescia

CENTRO DI FITNESS METABOLICA



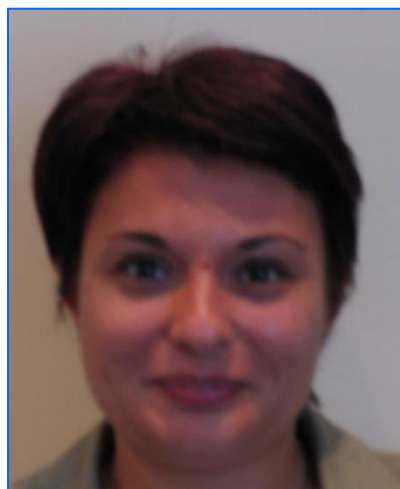
30 Arruolati
2 Drop-out



Umberto Valentini



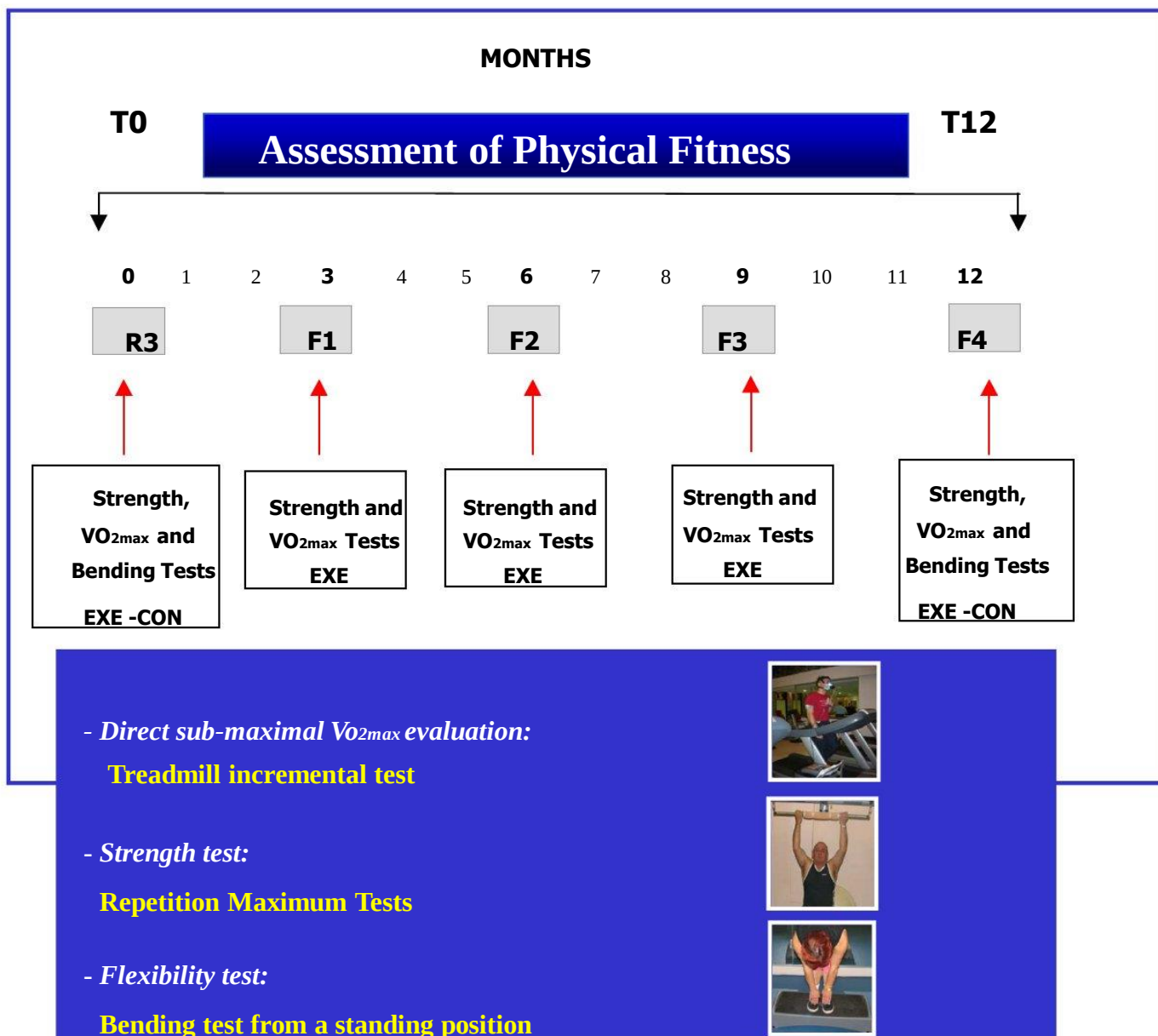
Angela Girelli



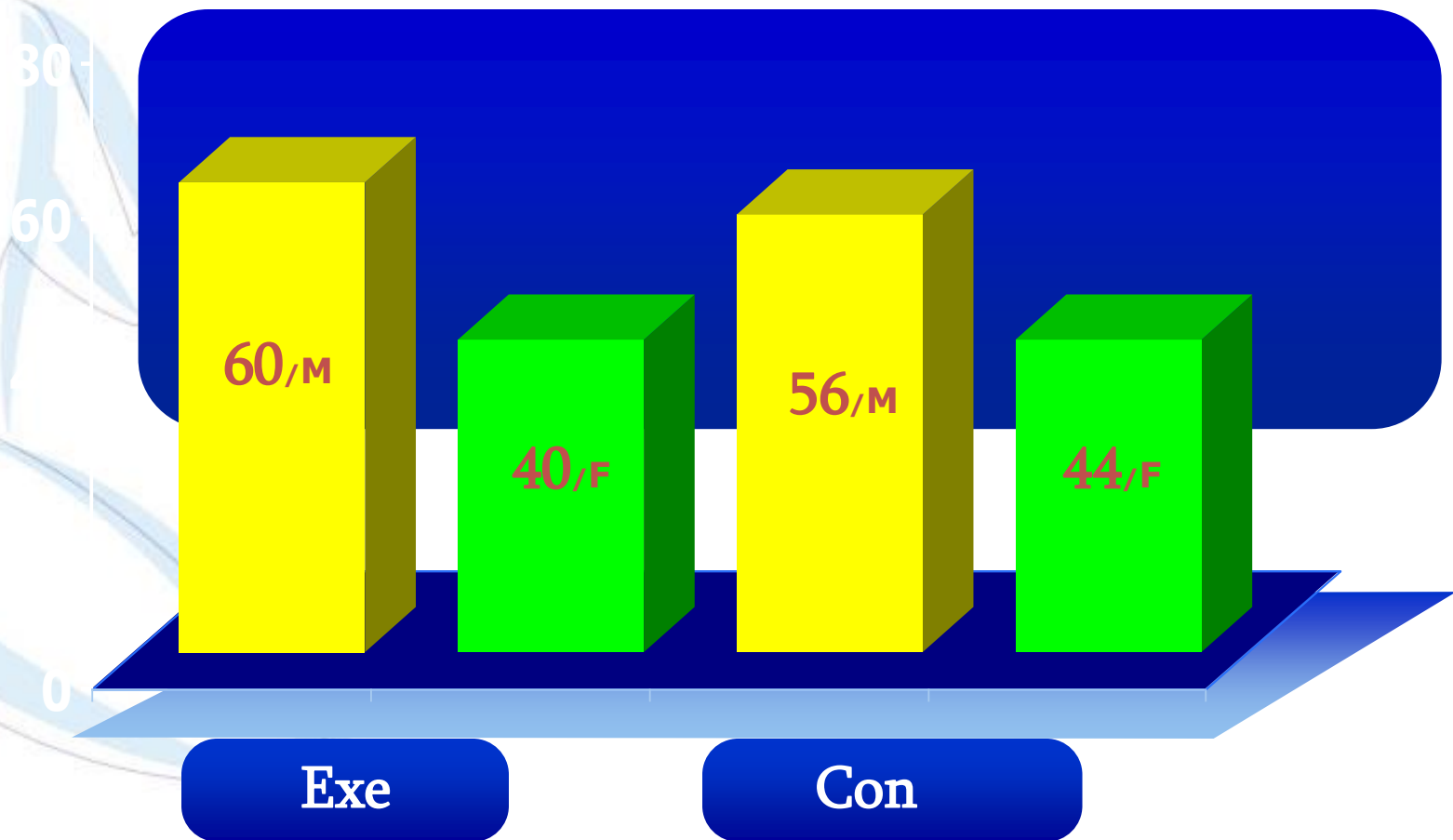
Emanuela Zarra_



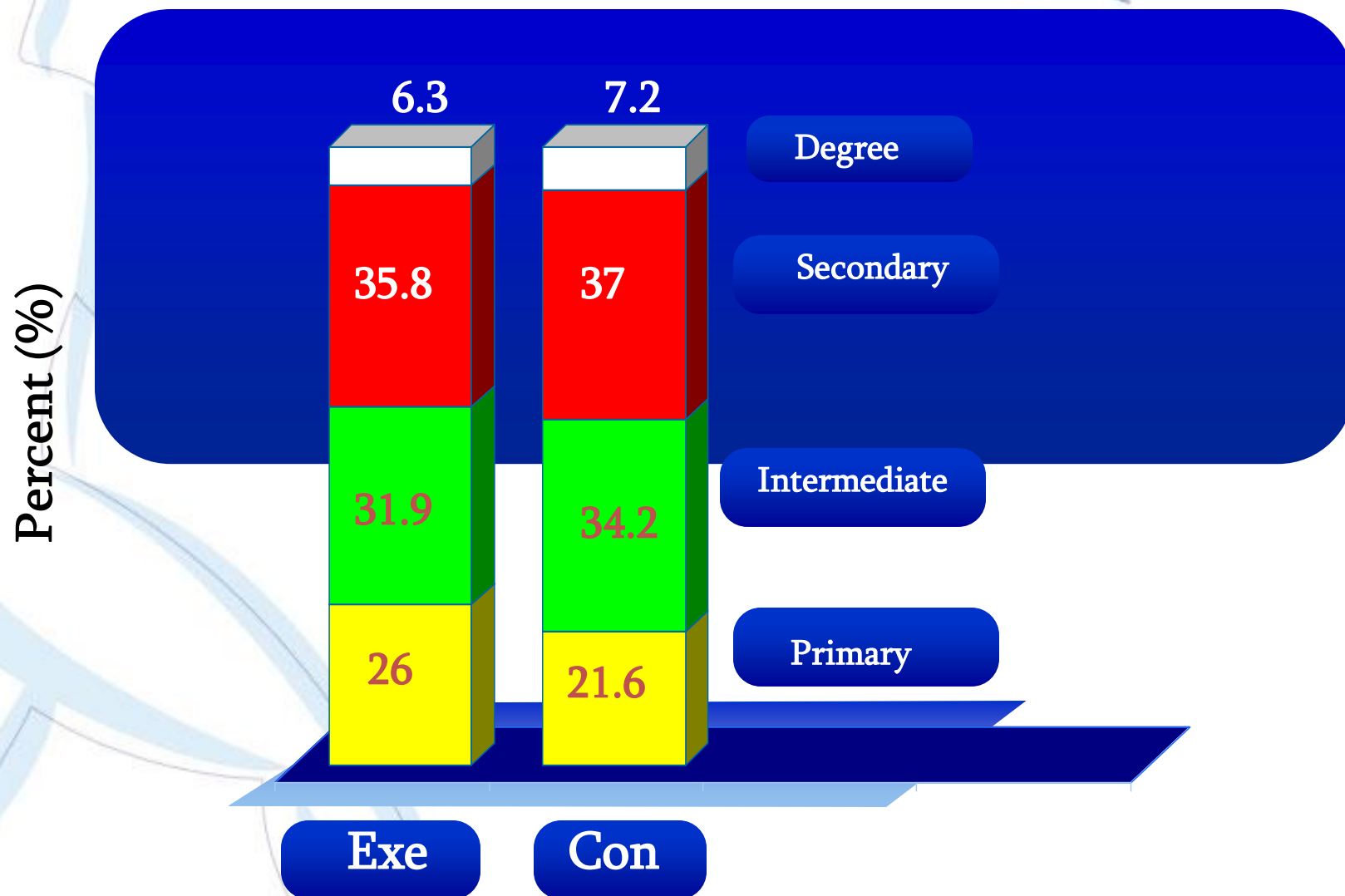
Davide Violi_



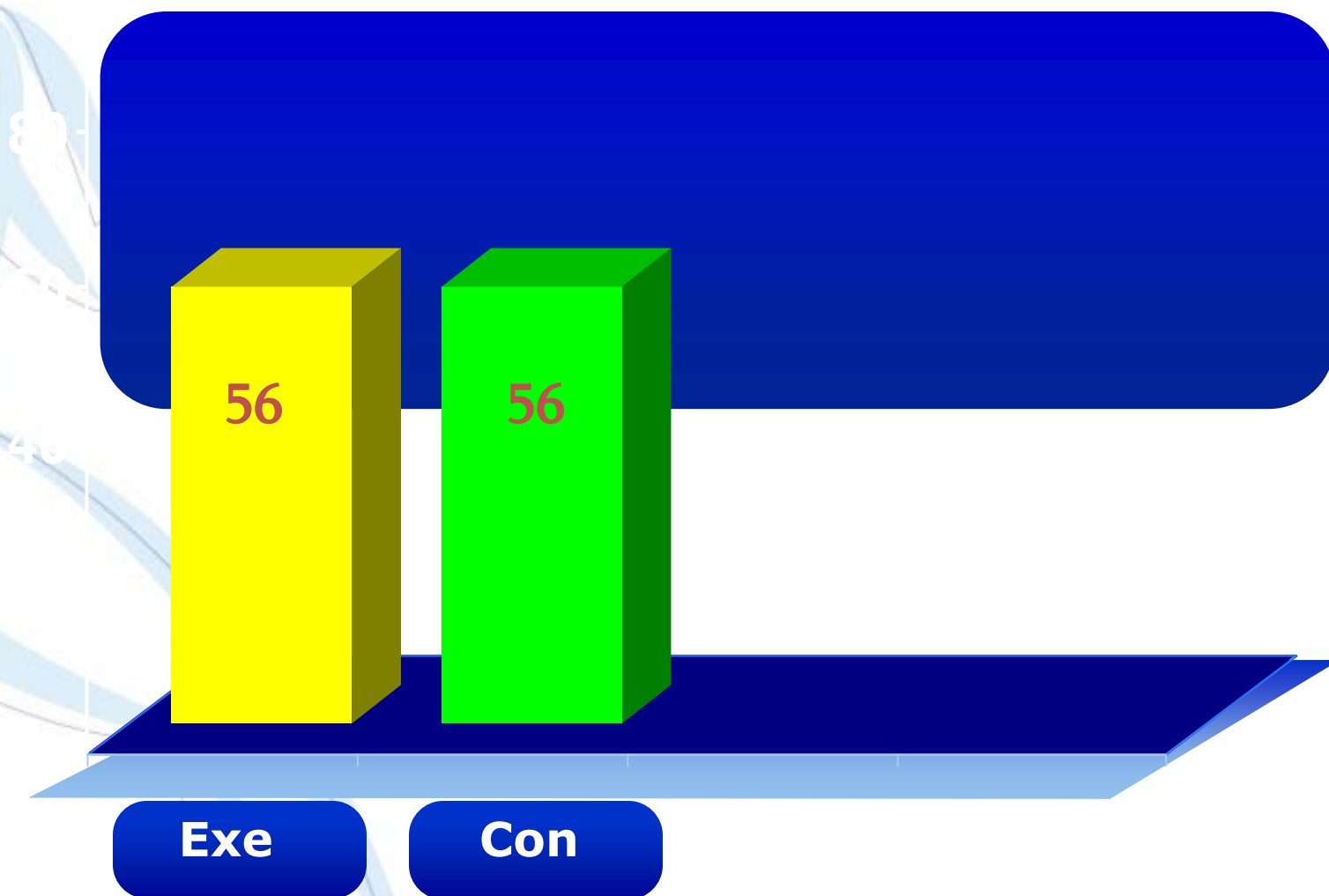
Gender



Schooling



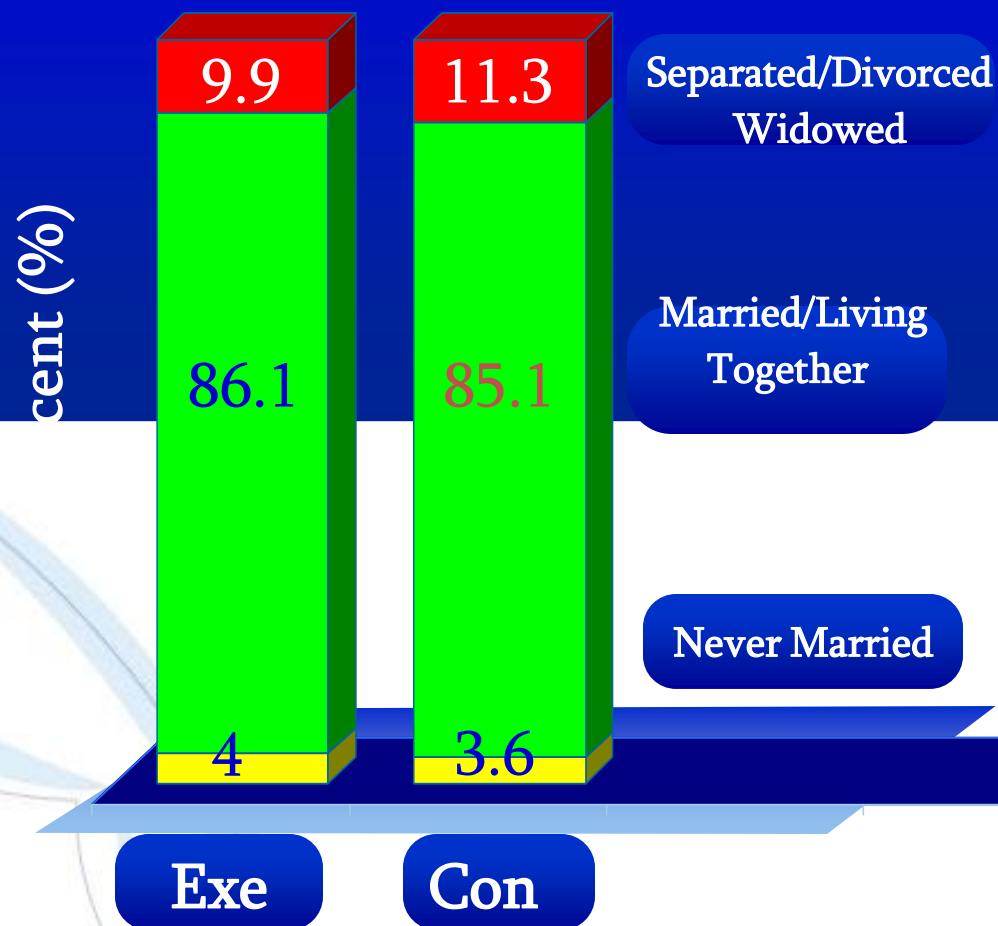
Age



Employment



Marital Status



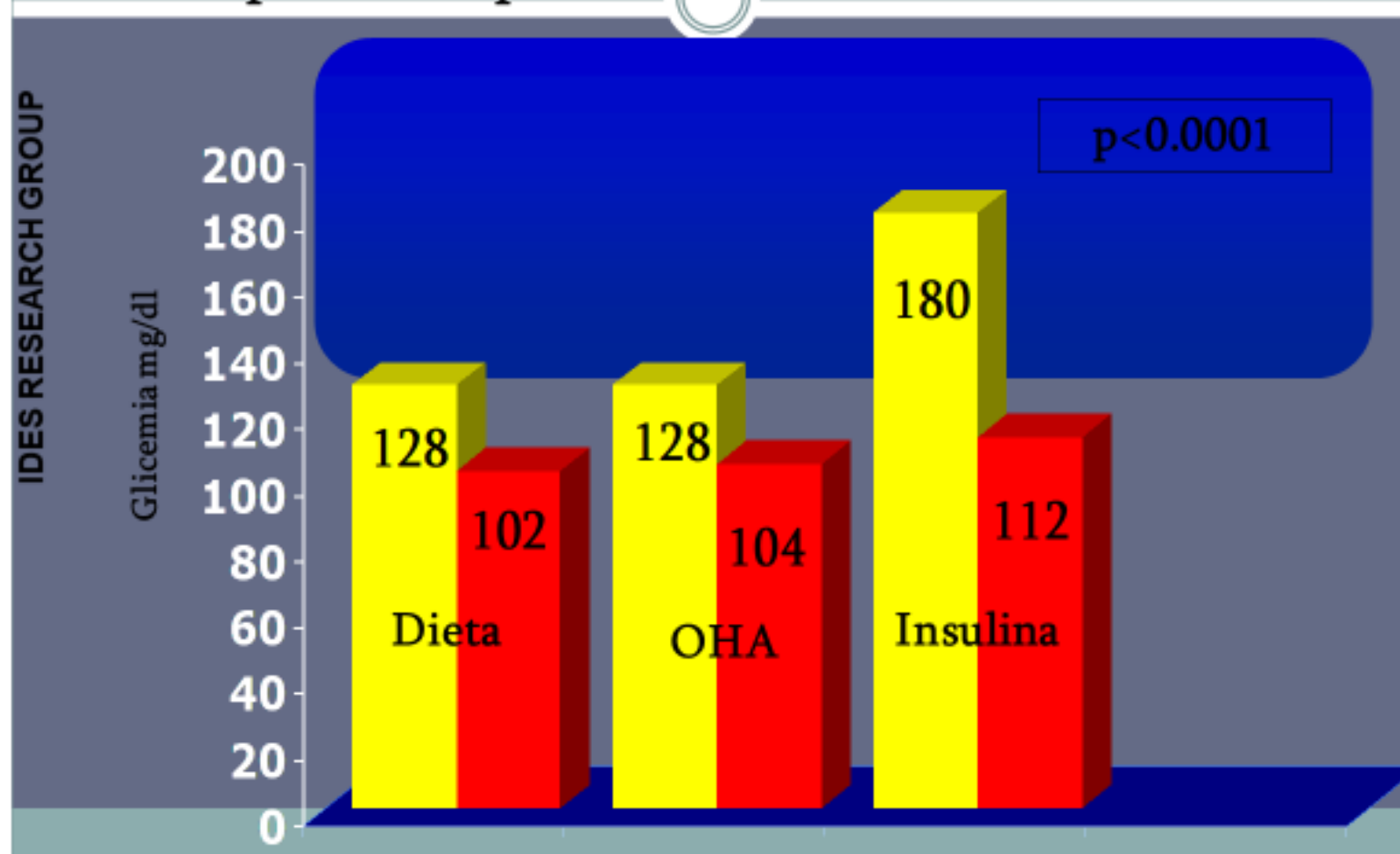
Smoking



Diabetes duration



Delta Glicemico e Terapia Farmacologica prima e dopo la seduta di esercizio fisico



Risultati

ORIGINAL INVESTIGATION

Effect of an Intensive Exercise Intervention Strategy on Modifiable Cardiovascular Risk Factors in Subjects With Type 2 Diabetes Mellitus

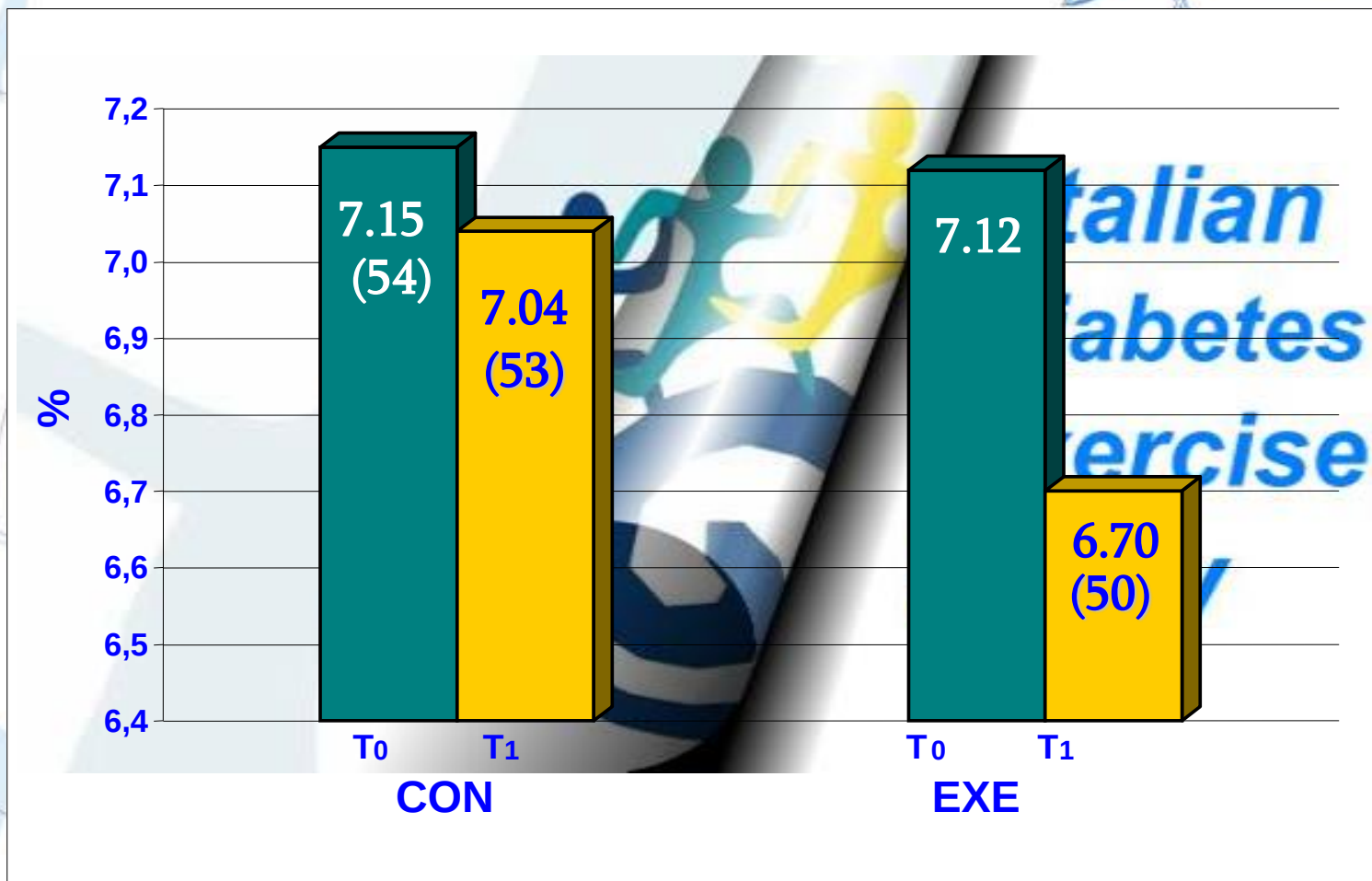
A Randomized Controlled Trial: The Italian Diabetes and Exercise Study (IDES)

Stefano Balducci, MD; Silvano Zanuso, PhD; Antonio Nicolucci, MD; Pierpaolo De Feo, MD, PhD; Stefano Cavallo, PhD; Patrizia Cardelli, PhD; Sara Fallucca, PhD; Elena Alessi, MD; Francesco Fallucca, MD; Giuseppe Pugliese, MD, PhD; for the Italian Diabetes Exercise Study (IDES) Investigators



Nutrition Metabolism Cardiovascular Disease, 2008
Diabetes 2008 (supplement; abstract 1068-P)
Diabetes Metabolism Research and Review, 2009
Diabetes 2010 (supplement; abstract 2391-PO)

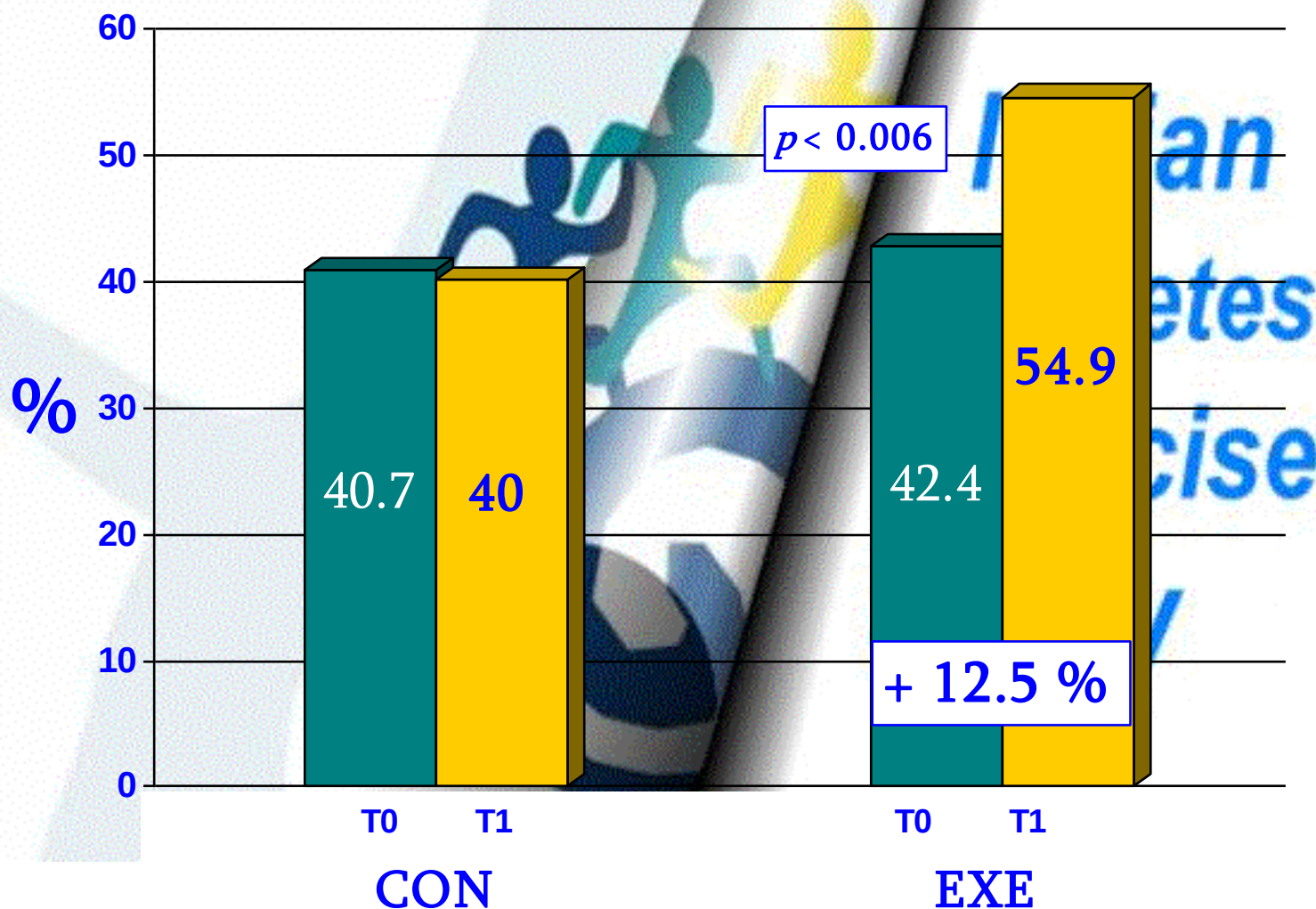
HbA_{1c}



$\Delta = -0.11 \%$
 $p = ns$

$\Delta = -0.42 \%$
 $p < 0.003$

**Pazienti a Target per l' HbA_{1c} (< 6.5)
prima e dopo lo studio in entrambi i gruppi**



Systolic and Dyastolic Blood Pressure (mmHg)

	CON			EXE			CON	EXE	
	T0	T1	p<	T0	T1	p<	Δ	Δ	
Systolic blood pressure	142± 17,9	138±16,2	0.001	141±18	133±14	0.0001	3.9±16.8	7.98±16.5	0.0001
Dyastolic blood pressure	84.8±10.2	83.1±9.3	0.006	84±10.4	80.5±8.4	0.0001	1.76±10	3.5±9.5	0.05

Number and Percent of patients on target for Systolic BP (<130 mmHg) and Dyastolic BP (<80 mmHg)

Number and percent of patients on target for	CON			EXE		
	T0	T1	p<	T0	T1	p<
Systolic blood pressure < 130 mmHg	85 (34.4)	106 (42.9)	ns	95 (38.8)	136 (55.5)	0.0003
Dyastolic blood pressure <80 mmHg	128 (51.2)	136 (54.4)	ns	135 (53.6)	176 (69.8)	0.0002

Plasma Lipid Values

	CON			EXE			CON	EXE	
	T0	T1	p<	T0	T1	p<	Δ	Δ	
Total cholesterol mg/dl	202± 33.7	185±39,9	0.01	199±31.8	181±39.9	0.001	17±46.7	18±45	ns
Triglyceride mg/dl	140± 82.2	158±97.9	0.02	130±96	151±109	0.0003	18±92,7	21±95	ns
HDL cholesterol mg/dl Female	49,2± 10,9	48,6± 12,4	ns	48,7±11,9	51,4±12,9	0.009	0,6±11,4	2,8±10,7	0.03
HDL cholesterol mg/dl Male	44,8± 10,4	43,1± 9,7	ns	43±11,6	45±11	0.02	1,7±11,1	1,5±12,8	0.003
LDL cholesterol mg/dl	128± 34	115± 35	0.0001	128±32	109±31	0.0001	13±43	19±38	ns

Number and Percent of patients on target for Lipid Profile

	CON			EXE		
	T0	T1	p<	T0	T1	p<
Total cholesterol mg/dl	100 (34.7)	153 (53.1)	0.0001	117(40.8)	168(58.5)	0.0001
Triglyceride mg/dl	182(69.7)	156(59.8)	ns	220(76,7)	187(65.2)	0.004
HDL cholesterol mg/dl Female	50(44.6)	40(35.7)	ns	48(42.5)	52(46)	ns
HDL cholesterol mg/dl Male	84±56	81(54)	ns	88(50.9)	113(65)	0.009
LDL cholesterol mg/dl	57(21.8)	85(32.4)	0.008	50(17.5)	118(41.4)	0.0001

Waist Circumference (Cm)

	CON			EXE			CON	EXE	
	T0	T1	p<	T0	T1	p<	Δ	Δ	
Waist Cm	105.4 $\pm$ 11	105.4 $\pm$ 12.4	ns	106 $\pm$ 11.6	102 $\pm$ 11.5	0.0001	0.01 $\pm$ 7.8	3.3 $\pm$ 4.4	0.0001

repeated measures ANOVA was used to test the differences in all variables within-group and among the groups

Body Mass Index (kg/m²)

	CON			EXE			CON	EXE	
	T0	T1	p<	T0	T1	p<	Δ	Δ	p<
BMI kg/m²	31.8± 4.4	31.7± 4.4	ns	31.3 ± 5	30.5± 4.6	0.0001	0.17±2	0.8±1.7	0.0002

repeated measures ANOVA was used to test the differences in all variables within-group and among the groups

Vo2max (Cardiorespiratory fitness)

Strength

Flexibility

	CON			EXE			CON	EXE	
	T0	T1	p<	T0	T1	p<	Δ	Δ	
VO2max ml/Kg/min	26,7± 7,3	27,2±7,2	ns	26,9±6,5	30,4±6,1	0.0001	0,45±5	3.52±5.4	0.0001
Muscle Strength, Kg									
Lower Body	100± 66	104± 68.3	0.02	108.9±67.5	143±75	0.0001	4±20.7	34±35	0.0001
Upper Body	39.3± 14.4	40.6± 14.9	0.001	41±15.3	52.3±16.6	0.0001	1.34±5.2	11.3±8.8	0.0001
Bending Cm	11.4± 10	10.5± 10.8	ns	13±10.5	7.5±9.9	0.0001	0.9±7.3	5.5±6.5	0.0001

repeated measures ANOVA was used to test the differences in all variables within-group and among the groups

In conclusione....

La combinazione di allenamento aerobico e di resistenza è ben tollerata, fattibile, sicura e migliora il controllo glicemico, i fattori di rischio cardiovascolare, e la composizione corporea nei pazienti diabetici tipo 2.

Per trattare adeguatamente i disturbi metabolici cronici l'attività fisica non è abbastanza ma è necessario un esercizio fisico prescritto e controllato.

Grazie per l'attenzione!



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