CONFERME SCIENTIFICHE
SUGLI EFFETTI POSITIVI DELLE DIETE MA-PI
SU DIVERSE PATOLOGIE CRONICHE METABOLICHE

a cura dell'Associazione Nazionale e Internazionale

UPM Un Punto Macrobiotico
2005 **Titolo:** Security and Nutritional Value of the Macrobiotic diet. The Cuban experience.
**Rivista:** Proceedings of EFFoST 2005 INTRAFOOD
**Oggetto:** Resoconto scientifico sui progetti MA-PI a Cuba (2001-2005)

2006 **Titolo:** The self-reliant system for alternative care of diabetes mellitus patients--experience macrobiotic management in Trad Province.
**Rivista:** Journal of the Medical Association of Thailand
**Oggetto:** 1° Progetto Diabete MA-PI in Tailandia (2001), Ministero della Sanità

2007 **Titolo:** Efecto terapéutico de la dieta Macrobiótica MA-PI2 en 25 adultos con Diabetes Mellitus tipo 2.
**Rivista:** Revista Cubana de Investigaciones Biomédicas
**Oggetto:** 3° Progetto Diabete MA-PI a Cuba (2004) presso l’Istituto Finlay

2008 **Titolo:** Caracterización y evaluación nutricional de las dietas macrobióticas MA-PI.
**Rivista:** Revista Cubana de Investigaciones Biomédicas
**Oggetto:** Valutazione nutrizionale diete MA-PI, Cuba (2008)

2009 **Titolo:** MA-PI 2 Macrobiotic Diet Intervention in Adults with Type 2 Diabetes Mellitus. **Rivista:** MEDICC Review; (Senza Impact Factor)
**Oggetto:** 4° Progetto Diabete MA-PI a Cuba (2005)

Título: Preliminary Study on the Effect of G.O.1 on hemorrhages caused by snake bites in rural communities of Northwestern Ghana”
**Rivista:** Revue Société des Sciences Naturelles de Tunisie; (Senza Impact Factor)
**Oggetto:** 1° Progetto GO1 in Ghana (2007)

2010 **Titolo:** Therapeutic effect of Macrobiotic MA-PI diet in Type 1 diabetic children.
**Rivista:** Journal of the Arab Board of Health Specializations, (Senza Impact Factor)
**Oggetto:** 6° Prog. Diabete MA-PI su diabete di tipo 1 Istituto Finlay (2007-2008)

Título: Effet curatif du regime macrobiotique MA-PI 2 chez le diabetique ivoirien
**Rivista:** Cahier de Santé Publique
**Oggetto:** 1° Progetto Diabete MA-PI in Costa d’Avorio Università di Cocody (2008)

2011 **Titolo:** MA-PI 2 macrobiotic diet intervention during 6 months in adults with type 2 diabetes mellitus, Cote d’Ivoire, 2010.
**Rivista:** Revue Société des Sciences Naturelles de Tunisie; (Senza Impact Factor)
**Oggetto:** 2° progetto diabete MA-PI Costa d’Avorio Università di Cocody (2010)

2012 **Titolo:** Medium and Short-Term Interventions with MA-PI 2 Macrobiotic Diet in Type 2 Diabetic Adults of Bauta, Havana.
**Rivista:** Journal of Nutrition and Metabolism;
**Oggetto:** 5° Progetto Diabete MA-PI a Cuba (2007)
Rivista: Minerva Endocrinologica (Impact Factor 1,14)

2012 Titolo: Reduced acid load of the macrobiotic MA-PI diet improves glycemic control and cardiovascular risk factor in type 2 diabetes.
Rivista: Annals of Nutrition & Metabolism

Rivista: Diabetes/ Metabolism Research and Reviews
Oggetto: 5° Progetto Diabete MA-PI a Cuba (2007)
1° Progetto Diabete MA-PI in Ghana Tamale Hospital (2011)

Titolo: Influence of diet on gut-microbiota, inflammation and type 2 diabetes mellitus. First experience with macrobiotic MA-PI 2 diet.
Rivista: Diabetes/ Metabolism Research and Reviews

Titolo: The effects of the MA-PI 2 macrobiotic diet in the treatment of type 2 diabetes and diet-induced metabolic acidosis
Rivista: Diabetes/ Metabolism Research and Reviews

Titolo: Dieta MA-PI 2 e marker infiammatori in pazienti con diabete di tipo 2
Rivista: Il Diabete

Titolo: The Effect of Macrobiotic (MA-PI 2) Diet on Systemic Inflammation in Patients with Type 2 Diabetes
Rivista: Diabetes

Titolo: The effect of the macrobiotic Ma-Pi 2 diet vs. the recommended diet in the management of type 2 diabetes: the randomized controlled MADIAB trial
Rivista: Nutrition and Metabolism

Titolo: Ma-Pi 2 macrobiotic diet intervention during 21 days in adults with type 2 diabetes mellitus, Ghana 2011
Rivista: Internal Medicine Inside
Oggetto: 1° Progetto Diabete MA-PI in Ghana Tamale Hospital (2011)

2015 Titolo: The effect of macrobiotic Ma-Pi 2 diet on systemic inflammation in patients with type 2 diabetes: a post hoc analysis of the MADIAB trial
Rivista: BMJ Open Diabetes Research and Care

Titolo: Gut microbiota and Ma-Pi 2 macrobiotic diet in the treatment of type 2 diabetes
Rivista: World Journal of Diabetes

Titolo: A 6-Months Study of Two Different Diets in Type 2 Diabetes (The Follow-up MADIAB Trial)
Rivista: Diabetes
18 LUGLIO 2005
REGIONE MARCHE
PROGETTO PREVENZIONE DELLE COMPLICANZE DEL DIABETE

Epidemiologia

Il diabete mellito, con le sue complicanze, è uno dei maggiori problemi sanitari dei paesi economicamente evoluti e la sua prevalenza è in continuo aumento, tale da indurre gli esperti a parlare di epidermia mondiale di diabete.

Esistono 2 forme principali di diabete mellito:

- il diabete di tipo 1, che rappresenta l’8% dei casi, è una forma prevalentemente infantile-giovane, richiede il trattamento insulinico sin dall’inizio ed è causato dall’interazione fra predisposizione genetica e cause ambientali non ancora chiare;

- il diabete di tipo 2, che rappresenta oltre il 90% dei casi, è caratteristico dell’età adulta – senile ed è spesso controllabile per anni con dieta, esercizio fisico e/o ipoglicemizzanti orali, mentre il trattamento insulinico si rende di solito necessario dopo un certo numero di anni di malattia.

La prevalenza del diabete di tipo 1 in Italia risulta essere tra lo 0,4 e l’1 per mille. L’incidenza è compresa tra i 6 e i 10 casi per 100.000 per anno nella fascia di età da 0 a 14 anni, mentre è stimata in 6,72 casi per 100.000 per anno nella fascia di età da 15 a 29 anni.

La prevalenza di diabete di tipo 2 è in continua crescita a causa dell’aumento dell’obesità e della seden
tarietà. La malattia nei primi anni è spesso asintomatica e non di rado la diagnosi viene posta in occasione di ricoveri per complicanze già in atto. Da questo discende che la prevalenza della malattia nota è stimata intorno al 3-4%, mentre indagini mirate con curva da carico di glucosio forniscono percentuali sensibilmente più elevate, del 6-11%. Il fenomeno del diabete tipo 2 misconosciuto è pertanto molto importante. Poiché esso si associa spesso con altre condizioni quali obesità, ipertensione, dislipidemia, che concorrono a definire la cosiddetta “sindrome metabolica”, la sua presenza va sempre cercata nelle persone che presentino una o più componenti della sindrome metabolica.

Nelle Marche non esiste un registro dei pazienti diabetici e la stima deve rifarsi a quella nazionale che vede una valutazione che può andare dal 3-4 % della popolazione (casi che sanno di averlo) al 6-11 % di popolazione che ne è effettivamente affetta. Pertanto sul milione e cinquecentomila abitanti della Regione Marche si può stimare una prevalenza della patologia tra 90.000 e 165.000 pazienti, consapevoli o meno.

Breve descrizione del sistema regionale per l’assistenza ai pazienti diabetici

Fonte: [http://www.ccm-network.it/documenti_Ccm/Prp/MARCHE/Piani_Marche/Marche_diabete.pdf](http://www.ccm-network.it/documenti_Ccm/Prp/MARCHE/Piani_Marche/Marche_diabete.pdf)
LOTTA AL DIABETE: LA V COMMISSIONE INCONTRA LE ASSOCIAZIONI DEI PAZIENTI Il Presidente Busilacchi: “Mi adopererò per la creazione di un dipartimento regionale per la cura del diabete.”

Nelle Marche i pazienti diabetici sono 115 mila, pari al 5% della popolazione residente (fonte Istat 2013). Questa patologia causa ogni anno 75mila infarti, 18mila ictus e 18mila morti. È la seconda patologia, per costi diretti e la più comune malattia cronica tra i bambini.

Le Marche sono una delle regioni in cui storicamente la rete dei servizi è stata tra le migliori in Italia, ma negli ultimi anni la patologia sta registrando un aumento con segnali di allarme che richiedono un intervento a livello di organizzazione sanitaria.

Il trend in crescita vede la nostra regione al quarto posto tra quelle del Centro nord. Sono questi i principali dati che le associazioni di pazienti diabetici hanno presentato questa mattina nel corso di un’audizione alla V Commissione Salute, presieduta da Gianluca Busilacchi.

All’incontro sono intervenuti il professor Egidio Archero, Presidente della FAND-Associazione Italiana diabetici e Vicepresidente di Diabete Italia, il Presidente della Federazione delle associazioni di tutela dei diritti dei diabetici marchigiani Emilio Agusto Benini, la Vicepresidente Maria Rosa Zampa e il Presidente del Comitato diabetologico marchigiano Giacomo Vespasiani.

L’incontro è avvenuto a poche ore dal convegno “Marche barometer diabetes”, un workshop promosso da Regione Marche, Inrca e Italian Barometer Diabetes Observatory Foundation, per fare il punto su ricerca, cura e prevenzione di una patologia che colpisce nel mondo 246 milioni di persone e che, secondo la Federazione internazionale del diabete, continuerà a crescere, fino ad interessare, entro il 2025, 380 milioni di pazienti.

Nel corso della seduta la Commissione ha incontrato anche il prof. Giulio Lupidi, docente di biochimica alla Scuola di scienze del farmaco dell’Università di Camerino, che ha presentato i primi risultati di una ricerca su una nuova molecola per la cura dei tumori al seno.

(L.V.)

Comunicato n.147, Venerdì 6 Giugno 2014

Fonte: http://www.consiglio.marche.it/informazione_e_comunicazione/comunicati_stampa/scheda.php?articolo=2965
TITOLO PUBBLICAZIONE SCIENTIFICA:
Dieta Macrobiotica MA-PI 2 e Diabete mellito tipo 2. Studio multicentrico

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CONCLUSIONI RIPORTATE NELLA PUBBLICAZIONE SCIENTIFICA:
L’intervento di 21 giorni con la dieta macrobiotica MA-PI 2 in pazienti adulti con diabete mellito di tipo 2 migliora il metabolismo dei glucidi, dei grassi e delle proteine e la pressione arteriosa. Il miglioramento del metabolismo dei carboidrati è stato simile nei diversi Paesi
PO1945

MA-PI MACROBIOTIC DIET AND TYPE 2 DIABETES. MULTICENTRIC STUDY

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Background and objectives: Satisfactory results have been observed in long term interventions with macrobiotic vegetarian Ma-Pi diet (70% carbohydrate as whole cereals, 12% vegetable protein, 18% fat) in diabetic patients. The aim of this study was to evaluate the short term effect of this diet in type 2 diabetes.

Methods: A 21-day multicenter intervention was carried out in adults from Cuba (n=11), China (n=16), Ghana (n=23) and Italy (n=24), supported by Un Punto Macrobiotics, Italy. Biochemical indicators, body composition and blood pressure were measured at onset and intervention end. Changes were analyzed by univariate and multivariate statistical methods.

Results: Significantly (p<0.001) decreased: glycosmia, 24.1%; cholesterol, 18.6%; LDL cholesterol, 21.5%; LDL/HDL ratio, 20.0%; cholesterol/HDL ratio, 18.2%; triglycerides, 21.4%; area, 32.5%; capillary blood glucose (3.6%), in fasting: 37.0% two hours after breakfast: 32.5%, two hours after lunch) blood pressure (systolic 7.3%; diastolic 6.1%); urine pH increased (13.6%). No adverse events were observed. Four components were extracted by Principal Component Analysis (PCA), which accounted for 69.3% of the total variance: PC1 was characterized by lipid indicators; PC2 by glycemia and glycemic profile; PC3 by blood pressure; PC4 by area and urine pH. Similar behavior was evidenced for glycosmia and glycemic profile in all countries, according to One-Way ANOVA of the extracted PC2 scores (p<0.027).

Conclusions: The 21-day intervention with Ma-Pi macrobiotic diet in type 2 diabetic adults improved carbohydrate, lipid and protein metabolism and blood pressure. The improvement of the carbohydrate metabolism showed a similar pattern in all countries.

Key words: Ma-Pi macrobiotic diet, type 2 diabetes, adults.

PO1946

SUGAR INTAKE IN CUBAN CHILDREN AND ADOLESCENTS

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Background and objectives: High sugar consumption is associated with overweight, glucose intolerance, serum lipids modifications and predisposition to diabetes mellitus. Nutritional recommendations set the sugar upper level intake around 10% of the total energy intake. The objective of this study was to assess its dimension in the Cuban young population.

Methods: 873 children and adolescents (56 preschoolers, 768 school children and 49 adolescents, 4-16 y of age) included in studies of body composition, physical activity and daily energy expenditure by isotopic methods were submitted to semi-quantitative dietary recalls, 24 hours dietary recalls or 3 day weighed dietary records for the assessment of the sugar contribution to the total energy intake. Data were evaluated with the FAO/WHO/UNICEF Software.

Results: High energy intake, fast foods and soft drinks; low consumption of fruits, vegetables, and micronutrients. Sugar intake doubled the nutritional recommendation. In some studied groups, one of each three children consumed more than three times the recommended daily portion.

Conclusions: The observed high sugar intake in all children and adolescents favours fat accretion and the high prevalence of NCDs in adulthood. Those results shall be urgently considered in the nutrition policy.

Key words: Adolescents, children, Sugar intake.
TITOLO PUBBLICAZIONE SCIENTIFICA:
Il ridotto carico acido della dieta macrobiotica MA-PI 2 migliora il controllo glicemico e il fattore di rischio cardiovascolare nel diabete mellito tipo 2

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CONCLUSIONI RIPORTATE NELLA PUBBLICAZIONE SCIENTIFICA:
La dieta macrobiotica MA-PI 2 migliora a breve termine l’insulino resistenza, riduce il rischio cardiovascolare nel diabete mellito tipo 2. E’ stata evidenziata la riduzione del carico acido
PO2171
REDUCED ACID LOAD OF THE MACROBIOTIC MA-PI DIET IMPROVES GYLCEMIC CONTROL AND CARDIOVASCULAR RISK FACTOR IN TYPE 2 DIABETES.
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Background and objectives: The diet acid load has been associated with inflammation, insulin resistance, and cardiovascular risk. Main purpose of this study was to evaluate the impact of the lower acid load of the macrobiotic vegetarian Ma-PI diet (70% carbohydrate as whole cereals, 12% vegetable protein, 18% fat) on this association.

Methods: A prospective 21 days dietary intervention was carried out in 24 adults with type 2 diabetes (13 men, 9 women; 60.3±6.4 y of age). Cases were selected from diabetic patients attending to the Preventive Medicine Centre of IPA, Rome. Subjects were submitted to anthropometric, body composition, biochemical, and blood pressure records. Data at onset and termination were compared.

Results: The lower diet acid load was evidenced by the 7% increase in urinary pH (p = 0.0027) and 10% in blood bicarbonate (p = 0.0014), together with a 27% reduction of the serum anion Gap (p = 0.0076). Significant decreases were present in: leucocytes, 15% (p = 0.0001); glycemia, 15% (p = 0.0000); insulinemia, 13% (p = 0.0000); HOMA-IR, 69% (p = 0.0000); total cholesterol, 18% (p = 0.0000); LDC, 25% (p = 0.0000); LDLc/HDLc 17% (p = 0.0013); triglyceridemia, 53% (p = 0.0000); uric, 5% (p = 0.0000); homocysteinemia, 17% (p = 0.0002); microalbuminuria, 15% (p = 0.0000); systolic blood pressure, 8.3% (p = 0.0000); and diastolic blood pressure, 7.8% (p = 0.0000).

Conclusions: The macrobiotic Ma-PI diet improved, at short-term, insulin resistance and decreased the cardiovascular risk in type 2 diabetic patients. The reduced lower acid load was evidenced.

Key words: macrobiotic diet, diet acid load, insulin resistance, cardiovascular risk, diabetes.

PO2172
EFFECT OF AMARANTH GRAIN CONSUMPTION ON HEALTH AND NUTRITION STATUS OF ADULTS LIVING WITH HIV IN MWEIGA, NYERI-KENYA
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Background and objectives: People living with HIV (PLHIV) are at greater risk of under nutrition, infections and death. Use of nutrient dense foods is one of the interventions to deal with these challenges. Minimal information exists on effect of consumption of amaranth grain on health and nutrition status. The objective of this study was to assess the effect of amaranth grain consumption on health and nutrition status of PLHIV.

Methodology: One group pre-test post-test experimental design was adopted. A comprehensive sample of 66 PLHIV not on antiretroviral therapy was purposively selected. The intervention involved daily consumption of porridge made from 100 grams of amaranth grain flour for six months. Dietary practices, nutrition status and CD4 cell count were monitored during the intervention period. Data were analyzed using SPSS computer software.

Results: Mean energy consumption increased by 13.1% from 3139±305 SD to 3519±386 SD for males and by 16.7% from 2479±312 SD to 2892±330 SD for females. There was a significant increase (p = 0.041) in CD4 cell count by 22.0% (105±16.35D). The proportion of the respondents who met the RDAs for zinc, iron, magnesium, calcium and vitamin E increased from below 40% to over 77% after addition of amaranth grain to the diet. The mean weight gain was 3.35±0.5 kg which led to a reduction on proportion that was underweight from 71.2% at baseline to 7.6% at month six.

Conclusions: Consumption of amaranth grain porridge supplemented the diet of PLHIV and enabled them to meet the RDAs for energy and selected micronutrients. It also led to increased CD4 count. This study recommends adoption of amaranth grain by PLHIV both at community and health facility level for improved health and nutrition status.

Key words: amaranth grain, HIV, CD4 count, weight gain, micronutrient status.
TITOLO PUBBLICAZIONE SCIENTIFICA:
Evidenze preliminari che la Dieta MA-PI 2 è più efficace della dieta standard della nutrizione medica nei pazienti con diabete mellito di tipo 2

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CONCLUSIONI RIPORTATE NELLA PUBBLICAZIONE SCIENTIFICA:
Nei pazienti con diabete mellito di tipo 2 e la sindrome metabolica, una somministrazione a breve termine della Dieta Ma-Pi 2 è più efficace rispetto alla dietes raccomandate dalle nutrizione medica per il profilo glicemico del diabete di tipo 2
Abstract: P-1277

Preliminary evidence that Ma-Mi 2 diet is more effective than standard recommended medical nutrition in subjects with type 2 diabetes

Type 2 diabetes (T2D) is one of the most challenging health problems in the 21st century. Medical nutritional therapy is an integral component of diabetes prevention, management, and self-management education. Modifying carbohydrate remains a key strategy in achieving good metabolic control.

Aims:

Following early data showing that Ma-Mi 2 Macrobiotic diet improves metabolic parameters in subjects with T2D and metabolic syndrome (MetS), we compared in a randomized controlled trial the effect of the Ma-Mi 2 macrobiotic diet vs. the standard diet recommended by the Italian Diabetes Society (40% protein, 30% fats, 59% carbohydrates with 35g fibers x day).

Methods:

We evaluated daily glucose profile, anthropometric and other clinical parameters including blood pressure and heart rate in 23 T2D patients following the Ma-Mi 2 diet (11 males, 12 females) and 27 T2D patients (15 males, 12 females) matched for age (range 41-87 years), body mass index (33.6±±4.4 kg/m²) and glucose control. Patients, guests in two hotels for the period of the trial, received the same caloric intake (1500 kcal for males and 1700 kcal for females, respectively) for 7 days and were strictly supervised by specialized nutritionists. Patients performed 22 blood glucose measurements per week. The Ma-Mi 2 diet consists in 40% vegetable protein, 30% fats and 30% carbohydrates with 40-50g fibers x day.

Results:

After 7 days on the prescribed diet, mean fasting blood glucose was significantly lower in the Ma-Mi 2 group (95±10 mg/dl, range: 79-115 mg/dl) compared to the group on standard diet (122±15 mg/dl, range: 94-202 mg/dl) (p<0.001). Moreover, 24% of patients on Ma-Mi 2 diet vs. 56% of those on standard diet reached blood glucose target (fasting 110 mg/dl, post-prandial 140 mg/dl) (p=0.001). Furthermore, a statistically significant reduction in body weight compared to entry into the trial (2.6 kg in the Ma-Mi 2 vs. 1.5 kg in controls) was observed (p=0.001). Also, a statistically significant reduction in systolic blood pressure was observed in the control group (p=0.05), while in the Ma-Mi 2 group a significant reduction of 24% in the heart rate (p=0.01) was noted.

Conclusions:

In patients with T2D and MetS a short term course of the Ma-Mi 2 diet is more effective than the recommended diet for T2D or blood glucose profile. However, long term safety and adherence data (longings) need to be carry out to demonstrate the efficacy of Ma-Mi 2 diet in the management of T2D.

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TITOLO PUBBLICAZIONE SCIENTIFICA:
Dieta Macrobiotica MA-PI 2 e diabete mellito tipo 2: analisi congiunta di studi a breve termine

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CONCLUSIONI RIPORTATE NELLA PUBBLICAZIONE SCIENTIFICA:
La dieta Ma-Pi 2 ha ridotto significativamente la glicemia, i lipidi serici, l'uricemia ed il rischio cardiovascolare in adulti con Diabete tipo 2. Questi risultati indicano che la dieta Ma-Pi 2 può essere un'alernativa valida di cura per i pazienti con Diabete Mellito tipo 2
Ma-Pi 2 macrobiotic diet and type 2 diabetes mellitus: pooled analysis of short-term intervention studies

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Summary

The macrobiotic, Ma-Pi 2 diet (12% protein, 18% fat and 70% carbohydrate), has shown benefit in adults with type 2 diabetes mellitus (T2DM). This pooled analysis aims to confirm results from four, 21-day intervention studies with the Ma-Pi 2 diet, carried out in Cuba, China, Ghana and Italy. Baseline and end of study biochemical, body composition and blood pressure data, were compared using multivariate statistical methods and assessment of the Cohen effect size (d). Results showed that all measured indicators demonstrated significant changes (p < 0.001); most of them with a very high (d ≥ 1.30), or high (d = 0.80–1.29) effect size. The global effect size of the diet was Italy (1.96), China (1.79), Cuba (1.38) and Ghana (0.98). The magnitude of the individual effect on each variable by country, and the global effect by country, was independent of the sample size (p > 0.05). Similarly, glycemia and glycemic profiles in all four studies were independent of the sample size (p = 0.237). The Ma-Pi diet 2 significantly reduced glycemia, serum lipids, uremia and cardiovascular risk in adults with T2DM. These results suggest that the Ma-Pi 2 diet could be a valid alternative treatment for patients with T2DM and point to the need for further clinical studies. Mechanisms related to its benefits as a functional diet are discussed. © 2013 The Authors. Diabetes/Metabolism Research and Reviews published by John Wiley & Sons, Ltd.

Keywords Ma-Pi 2 macrobiotic diet; type 2 diabetes; adults; vegetarian diets; whole-grain cereals

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TITOLO PUBBLICAZIONE SCIENTIFICA:
Influenza della dieta sul microbiota intestinale, infiammazione a diabete mellito tipo 2: prima esperienza con la dieta macrobiotica MA-PI 2

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CONCLUSIONI RIPORTATE NELLA PUBBLICAZIONE SCIENTIFICA:
In un recente studio clinico di 21 giorni in pazienti con diabete mellito tipo 2 è stato studiato l’impatto della dieta macrobiotica MA-PI 2; i risultati suggeriscano che questa induca un significativo miglioramento della glicemia a digiuno, dei lipidi plasmatici, dell’insulinemia e della omeostasi. E’ quindi possibile che una dieta ricca di prebiotici e probiotici svolga un azione positiva nel diabete mellito tipo 2 probabilmente dovuta alla modulazione del microbiota intestinale.
Influence of diet on gut microbiota, inflammation and type 2 diabetes mellitus. First experience with macrobiotic Ma-Pi 2 diet

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Abstract

Type 2 diabetes mellitus (T2DM) is a complex disorder influenced by both genetic and environmental factors. Recent studies have suggested that an imbalance of the intestinal microbiota may be involved in the development of several human diseases, including obesity and T2DM. The main regulators of the intestinal microbiota are age, ethnicity, the immune system and diet. A high-fat diet may induce dysbiosis, which can result in a low-grade inflammatory state, obesity and other metabolic disorders. Adding prebiotics to the diet may reduce inflammation, endotoxaemia and cytokine levels as well as improving insulin resistance and glucose tolerance. The administration of prebiotics such as fermentable dietary fibres, promotes glucagon-like peptide 1 and peptide YY (anorexigenic) and decreases ghrelin (orexigenic). In a recent 21-day intervention study in patients with T2DM, the effect of using the macrobiotic Ma-Pi 2 diet was investigated. Results suggested that it could induce a significant improvement in fasting blood glucose, plasma lipid fractions, plasma insulin and homeostasis. It is therefore possible that a diet rich in prebiotics and probiotics can play a role in T2DM management, probably due to positive intestinal microbiota modulation. However, this must be demonstrated by larger studies including randomized controlled trials that measure indicators of inflammation. Copyright © 2013 John Wiley & Sons, Ltd.
TITOLO PUBBLICAZIONE SCIENTIFICA:
Dieta Macrobiotica MA-PI 2 e Marker infiammatori in pazienti con diabete di tipo 2

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CONCLUSIONI RIPORTATE NELLA PUBBLICAZIONE SCIENTIFICA:
Possiamo affermare che la dieta MA-PI 2 è efficace nel ridurre l’infiammazione e l’insulino-resistenza
Le attuali linee guida sottolineano l’importanza della dieta come terapia di prima scelta nel paziente con diabete tipo 2 (T2D) o con sindrome metabolica (SM). Tuttavia l’effetto della dieta sull’infiammazione e sull’insulinoresistenza rimane poco chiaro, per questo abbiamo valutato gli effetti sui marker infiammatori di una dieta macrobiotica, Ma-Piz, rispetto ad una dieta standard (dieta di controllo) in pazienti con T2D. È stato condotto uno studio randomizzato e controllato (durata 21 giorni) su 51 pazienti (25 maschi, 26 femmine) con T2D o SM paragonabili per età (41-77 anni), indice di massa corporea (33.6 ± 6.4 kg/m²) e controllo metabolico. In tutti i pazienti, all’inizio ed alla fine dello studio, sono stati valutati introito calorico/die, perdita di peso, sensibilità all’insulina, potenziale antiossidante del plasma (BAP-test), livelli di proteina C-reattiva (hs-CRP), fattore di necrosi tumorale-alfa (TNF-alfa) e fattore di crescita insulino-simile 1 (IGF-1). L’introito calorico medio giornaliero era pari a 1803 kcal (12% proteine, 15% grassi, 73% carboidrati, fibre 29 g/1000 kcal) per il gruppo Ma-Pi e a 1798 kcal (18% proteine, 32% grassi, 49% carboidrati, fibre 20.5 g/1000 kcal) per il gruppo di controllo. I risultati dello studio hanno mostrato: una diminuzione nella resistenza insulinica nel gruppo Ma-Pi (HOMA-IR 15% [95% CI 3.65: 37.51]), una riduzione del peso corporeo significativamente più alta nel gruppo Ma-Pi (p < 0.001), una riduzione dei marker infiammatori (TNF-alfa_Ma-Pi: 18 pg/mL [95% CI: 8.1; 28.1] TNF-alfa_controlli: 20 pg/mL [95% CI: 4.9; 27.9], hs-CRP_Ma-Pi: 33.1% [95% CI: 11.4; 54.9] hs-CRP_controlli: 23.1% [95% CI: 1.2; 45]), un miglioramento di BAP test nel gruppo Ma-Pi (-26.9% [95% IC: -44.7; -9.1]) ed una riduzione di IGF-1 nel gruppo Ma-Pi (p < 0.001). Concludendo possiamo affermare che la dieta Ma-Piz è efficace nel ridurre l’infiammazione e l’insulino-resistenza.
TITOLO PUBBLICAZIONE SCIENTIFICA:
L’Effetto della Dieta Macrobiotica (Ma-Pi 2) sulla infiammazione sistemica nei pazienti con diabete tipo 2

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CONCLUSIONI RIPORTATE NELLA PUBBLICAZIONE SCIENTIFICA:
La dieta Ma-Pi 2 è una strategia sana per ridurre gli indicatori di insulino-resistenza e di infiammazione e deve essere considerata per i pazienti con diabete mellito di tipo 2
The Effect of Macrobiotic (Ma-Pi 2) Diet on Systemic Inflammation in Patients with Type 2 Diabetes

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Nutrition - Clinical
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Current guidelines for the management of the components of type 2 diabetes (T2D) and the metabolic syndrome (MetS) emphasize diet as essential therapy, however the effect of diet on systemic inflammation and peripheral insulin resistance remains unclear.

We investigated the effects of a Macrobiotic (Ma-Pi 2) diet vs. standard recommended diet (control diet) on markers of inflammation in patients with T2D.

A 21-days randomized controlled trial was conducted among 51 patients (25 males and 26 females) with T2D or MetS only matched for age (range 41-77 years), body mass index (33.6±6.4 kg/m2) and glucose control.

Nutrient intake, weight loss, insulin sensitivity, biological antioxidant potential of plasma (BAP-test) and circulating levels of high-sensitivity C-reactive protein (hs-CRP), interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-alpha) and insulin-like growth factor 1 (IGF-1) were assessed.

After 21 days on the prescribed diet, the daily average energy intake was of 1803 kcal (12 % protein, 15 % fat, and 73 % complex carbohydrates, with 29 g/1000 kcal fiber) for the Ma-Pi group and of 1798 kcal (18 % protein, 32 % fat, and 49 % carbohydrates, with 20.5 g/1000 kcal fiber) for the control group (p = 0.860). A major decreased in insulin resistance was obtained in the Ma-Pi group (HOMA-IR 15% [95% CI 3.65; 37.51]) vs. control diet. Weight loss was obtained in both group, however it was significantly higher in the Ma-Pi group vs. control group (p<0.001). At the end of the study inflammation was reduced in both groups (TNF-alpha Ma-Pi diet: 18 pg/mL [95%CI:8.1,28.1; Control diet: 20 pg/mL [95%CI:4.9,27.9], hs-CRP (Ma-Pi diet: 33.1% [95%CI:11.4;54.9; Control diet: 23.1% [95%CI:1.2;45]). BAP improved significantly in the Ma-Pi group (-26.9%[95%CI:-44.7; -9.1]). A significant reduction in IGF-1 was observed in the Ma-Pi group vs. control group (p<0.001).

Ma-Pi diet is a safe strategy to reduce, markers of insulin resistance and inflammation and may be considered for patients with T2D.
The effect of the macrobiotic Ma-Pi 2 diet vs. the recommended diet in the management of type 2 diabetes: the randomized controlled MADIAB trial

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Abstract

Background: Diet is an important component of type 2 diabetes therapy. Low adherence to current therapeutic diets points out to the need for alternative dietary approaches. This study evaluated the effect of a different dietary approach, the macrobiotic Ma-Pi 2 diet, and compared it with standard diets recommended for patients with type 2 diabetes.

Methods: A randomized, controlled, open-label, 21-day trial was undertaken in patients with type 2 diabetes comparing the Ma-Pi 2 diet with standard (control) diet recommended by professional societies for treatment of type 2 diabetes. Changes in fasting blood glucose (FBG) and post-prandial blood glucose (PPBG) were primary outcomes. HbA1c, insulin resistance (IR), lipid panel and anthropometrics were secondary outcomes.

Results: After correcting for age, gender, BMI at baseline, and physical activity, there was a significantly greater reduction in the primary outcomes FBG (95% CI: 1.79; 13.46) and PPBG (95% CI: 5.39; 31.44) in those patients receiving the Ma-Pi 2 diet compared with those receiving the control diet. Statistically significantly greater reductions in the secondary outcomes, HbA1c (95% CI: 1.28; 5.46), insulin resistance, total cholesterol, LDL cholesterol and LDL/HDL ratio, BMI, body weight, waist and hip circumference were also found in the Ma-Pi 2 diet group compared with the control diet group. The latter group had a significantly greater reduction of triglycerides compared with the Ma-Pi 2 diet group.

Conclusions: Intervention with a short-term Ma-Pi 2 diet resulted in significantly greater improvements in metabolic control in patients with type 2 diabetes compared with intervention with standard diets recommended for these patients.

Trial registration: Current Controlled Trials ISRCTN10467793.

Keywords: Fasting blood glucose, Macrobiotic diet, Type 2 diabetes
Diet and Lifestyle Changes as Therapy for Type 2 Diabetes
The effects of the MA-PI 2 macrobiotic diet in the treatment of type 2 diabetes and diet-induced metabolic acidosis

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Dear Editor,

In a recent issue of Diabetes/Metabolism Research and Reviews, Porrata-Maury et al. [1] describe a pooled analysis of four different studies on the effects of the MA-PI 2 macrobiotic diet on type 2 diabetes mellitus (T2DM).

The findings of this analysis suggested a link between dietary intake of foods that contain high levels of animal protein and low amounts of vegetables and a chronic state of untreated metabolic acidosis [2]. Recently, T2DM and insulin resistance have been associated with changes in metabolic acidosis markers, including low serum bicarbonate, high serum anion gap and low urine pH [3]. Our data derived from a small pilot study in Italy highlight a specific biochemical and physiological mechanism that may be useful in explaining these results.

This 21-day, single-arm, prospective pilot study was designed as a follow-on from other preliminary studies [4] and aimed to evaluate the potential of the MA-PI 2 macrobiotic diet in Caucasian patients with T2DM and to assess whether the MA-PI 2 diet improved the markers of metabolic acidosis. Twenty-four adults with T2DM (mean age 60.3 ± 6.4 years; body mass index 30.2 ± 4.67 kg/m²) were enrolled in the study from the Preventive Medicine Center of Rome Municipality. Of the 24 patients, 13 were newly diagnosed or were previously untreated, nine had been treated with oral hypoglycaemic agents, and two with oral hypoglycaemic agents plus insulin. Dietary compliance was assessed, and energy intake was recorded on a weekly basis. Capillary glucose profiles were generated once every 3 days on fasting blood samples, as well as on samples taken 2 h after breakfast and 2 h after lunch. Blood sample analyses and anthropometrical measurements were assessed at baseline (T0) and after 21 days (T21). The homeostatic model assessment (HOMA) was used for assessing insulin resistance (IR); the HOMA2-IR index was obtained using the HOMA Calculator v2.2.2 programme [5].

Results showed that compliance with the MA-PI 2 diet was good with no dropouts. The average daily energy intake in the 3 months prior to study was 2164 kcal, consisting of 18.2% protein, 36.2% fat, 45.6% carbohydrate and 18.8 g fibre. During the study, the MA-PI 2 diet average daily energy intake was 2003 kcal, consisting of 12% protein, 18% fat, 70% complex carbohydrate and 61 g fibre.

Changes in clinical measures after 21 days of the MA-PI 2 diet were highly significant (Table 1). In addition, both urinary pH (p = 0.0027)
Table 1. Changes in clinical measures after 21 days of MA-PI 2 diet administration, based on 24 participants

<table>
<thead>
<tr>
<th>Variables</th>
<th>T0 Mean ± SD</th>
<th>T21 Mean ± SD</th>
<th>Change %</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting venous blood glucose (mg/dl)</td>
<td>139.0 ± 32.2</td>
<td>89.7 ± 15.6</td>
<td>-35.5</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>2-h post-breakfast blood glucose (mg/dl)</td>
<td>158.3 ± 54.8</td>
<td>97.4 ± 13.7</td>
<td>-38.5</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>2-h post-lunch capillary blood glucose (mg/dl)</td>
<td>179.2 ± 44.9</td>
<td>100.7 ± 9.5</td>
<td>-43.8</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td>6.7 ± 1.1</td>
<td>6.1 ± 0.8</td>
<td>-9</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>HOMA2-IR</td>
<td>2.2 ± 2.8</td>
<td>2.7 ± 2.7</td>
<td>-8.2</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Total cholesterol (mg/dl)</td>
<td>153.6 ± 35.1</td>
<td>149.3 ± 35.6</td>
<td>-22.9</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>LDL (mg/dl)</td>
<td>123.0 ± 26.1</td>
<td>93.3 ± 29.5</td>
<td>-24.1</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Triglycerides (mg/dl)</td>
<td>209.7 ± 129.8</td>
<td>98.1 ± 32.0</td>
<td>-53.2</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Creatinine (mg/dl)</td>
<td>0.89 ± 0.17</td>
<td>0.84 ± 0.21</td>
<td>-5.6</td>
<td>0.013</td>
</tr>
<tr>
<td>Microalbuminuria (mg/L)</td>
<td>37.2 ± 29.5</td>
<td>6.9 ± 8.5</td>
<td>-81.5</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>30.2 ± 4.7</td>
<td>28.4 ± 4.4</td>
<td>-6</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Waist circumference (cm)</td>
<td>100.6 ± 10.9</td>
<td>96.9 ± 10.0</td>
<td>-3.7</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Urinary pH</td>
<td>5.8 ± 0.4</td>
<td>6.2 ± 0.6</td>
<td>7</td>
<td>0.0027</td>
</tr>
<tr>
<td>Serum anion gap (mEq/L)</td>
<td>18.9 ± 3.8</td>
<td>13.8 ± 4.3</td>
<td>-27</td>
<td>0.0006</td>
</tr>
<tr>
<td>Serum HCO₃ (mEq/L)</td>
<td>22.6 ± 2.5</td>
<td>24.8 ± 3.2</td>
<td>10</td>
<td>0.0014</td>
</tr>
</tbody>
</table>

HbA1c, glycosylated haemoglobin; HOMA, homeostatic model assessment; IR, insulin resistance; LDL, low-density lipoprotein; SD, standard deviation; BMI, body mass index.

*aPaired t-test or Wilcoxon signed-rank test.

*bHOMA2-IR results are based on N = 22 because two participants were treated with insulin.

and serum bicarbonate (p = 0.0014) increased significantly, and serum anion gap (p = 0.0006) decreased significantly.

These preliminary findings suggest that short-term intervention with MA-PI 2 diet can reduce insulin resistance and improve metabolic control in T2DM Caucasian subjects and help with the treatment of metabolic acidosis. These findings point to the need for randomized controlled trials of the MA-PI 2 diet.

Conflicts of interest

The authors declare that they have no conflict of interest.

References


The effect of macrobiotic Ma-Pi 2 diet on systemic inflammation in patients with type 2 diabetes: a post hoc analysis of the MADIAB trial

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ABSTRACT

Introduction: Current guidelines for the management of type 2 diabetes (T2D) emphasize diet as essential therapy. However, the effect of diet on systemic inflammation remains unclear. We investigated the effects of consuming a macrobiotic Ma-Pi 2 diet versus a standard recommended diet (control diet) on markers of inflammation in patients with T2D.

Methods: This was a post hoc analysis of the MADIAB trial, a 21-day randomized controlled trial conducted in 51 patients (25 males and 26 females) with T2D. Patients were randomized 1:1 to the Ma-Pi 2 macrobiotic diet or a control diet based on dietary guidelines for T2D. Biological antioxidant potential of plasma and circulating levels of high-sensitivity C reactive protein, interleukin-6, tumor necrosis factor-α, and insulin-like growth factor-1 were assessed.

Results: After 21 days on the Ma-Pi 2 or control diet, markers of inflammation were reduced in both groups. The antioxidant potential of plasma improved significantly in the Ma-Pi group. A significant reduction in insulin growth factor-1 was observed in the Ma-Pi group versus control group (p<0.001).

Conclusions: Findings of this post hoc analysis demonstrated that the Ma-Pi 2 diet is a safe dietary strategy to reduce levels of the markers of insulin resistance and inflammation, compared with baseline values, in the short term. Furthermore, the Ma-Pi 2 diet was superior to the control diet in reducing insulin growth factor-1 and may be beneficial for patients with T2D.

Trial registration number: Current Controlled Trials ISRCTN10467793.

Key messages

- Results of this post hoc analysis of the MADIAB Trial, a 21-day randomized controlled trial in patients with type 2 diabetes, showed that the macrobiotic Ma-Pi 2 diet is a safe dietary treatment to reduce levels of the inflammatory markers in the short term.
- The Ma-Pi 2 diet was superior to the standard recommended diet for type 2 diabetes in reducing insulin resistance, insulin growth factor-1.
- Further studies are required to elucidate whether the short term changes in inflammatory markers obtained with the Ma-Pi 2 diet are maintained over a longer time.

Type 2 diabetes (T2D) is one of the major public health challenges of the 21st century. Diet and lifestyle directly influence the health status of a population, and rates of T2D continue to increase with the global trend toward a greater prevalence of obesity and reduced physical activity.1 Major risk factors for T2D have also been found to induce local or systemic low-grade chronic inflammation. Systemic inflammation is independently associated with insulin resistance, as supported by studies conducted in adults and adolescents.2 4

Chronic low-grade inflammation has been hypothesized as an underlying pathophysiological mechanism linking obesity to T2D.3 Tumor necrosis factor (TNF) α is a potent cytokine produced by adipose tissue that induces the production of interleukin-6 (IL-6).5 Plasma levels of TNF are persistently elevated in patients with obesity or T2D, and the role of TNF in promoting insulin resistance is mediated by an increase in adipocyte lipolysis.6 Because TNF is the first step in the inflammatory cascade, it is not surprising that plasma levels of IL-6 are high in patients with obesity or T2D. Similarly, IL-6 concentrations also correlate with insulin resistance in humans.7 One of the most important effects of IL-6 is that it controls hepatic C reactive protein (CRP) production. CRP is a key inflammatory marker in humans, and is positively associated with degree of obesity, and fasting glucose and insulin levels.8

Gut microbiota and Ma-Pi 2 macrobiotic diet in the treatment of type 2 diabetes

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Author contributions: Fallucca F and Pianesi M conceived and designed the manuscript; Fallucca F, Fontana L and Fallucca S searched the literature and selected relevant studies; Fallucca F and Fontana L drafted the manuscript; Fallucca S and Pianesi M critically reviewed the manuscript drafts; all authors read and approved the final manuscript.

Conflict-of-interest: The authors declare that they have no conflicts of interest.

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Abstract
In the past 10 years the prevalence of type 2 diabetes mellitus (T2DM) has increased hugely worldwide, driven by a rise in the numbers of overweight and obese individuals. A number of diets have been shown to be effective for the management of T2DM: the Mediterranean diet, the vegetarian diet and the low-calorie diet. Results of studies clearly indicate, however, that the efficacy of these diets is not solely related to the biochemical structure of the individual nutrients they contain. This review discusses this point with reference to the potential role of the intestinal microbiota in diabetes. The macrobiotic Ma-Pi 2 diet is rich in carbohydrates, whole grains and vegetables, with no animal fat or protein or added sugar. In short- and medium-term trials conducted in patients with T2DM, the Ma-Pi 2 diet has been found to significantly improve indicators of metabolic control, including fasting blood glucose, glycosylated hemoglobin, the serum lipid profile, body mass index, body weight and blood pressure. The diet may also alter the gut microbiota composition. Hence, the Ma-Pi 2 diet could be considered a valid additional short- to medium-term treatment for T2DM.

Key words: Ma-Pi 2 macrobiotic diet; Type 2 diabetes; Low-grade inflammation; Gut microbiota; Metabolic control

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