



# Le comorbidity delle cefalee primarie del bambino

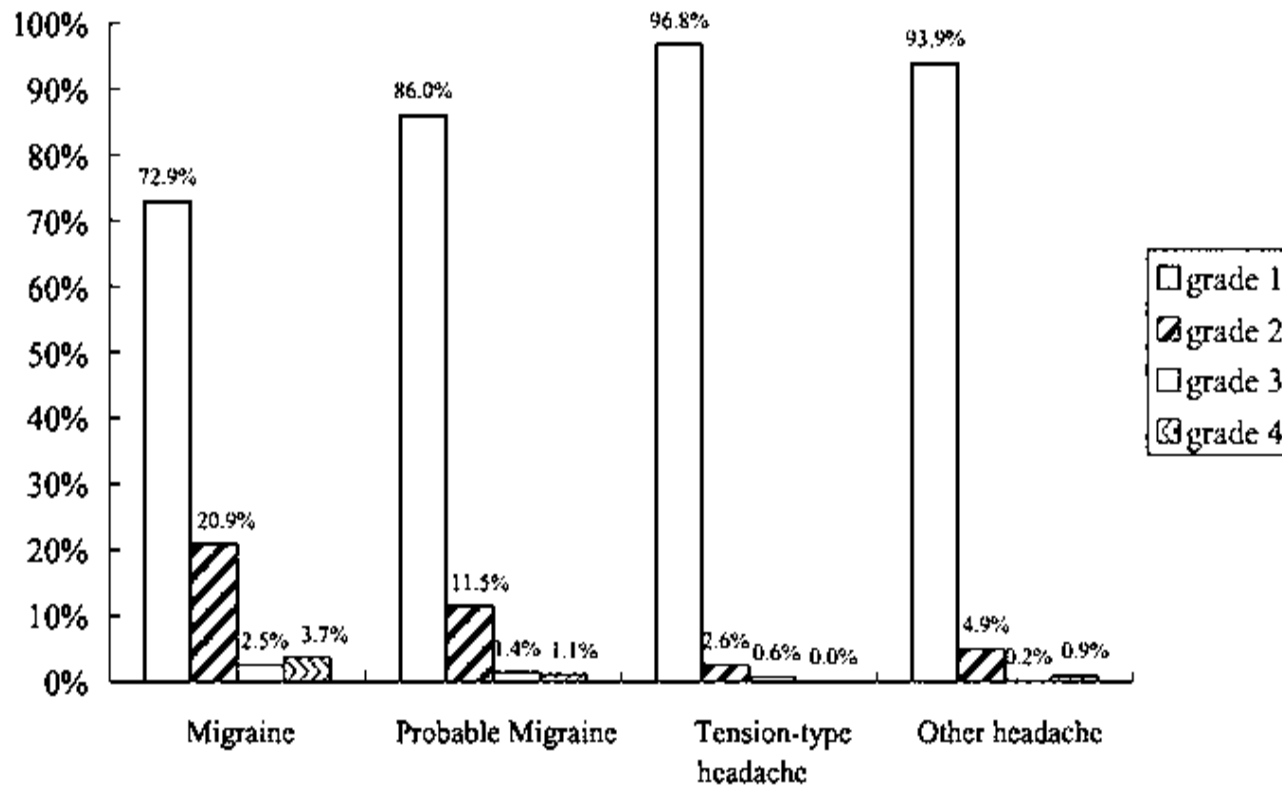
Maria Esposito

Ricercatore  
UOC Neuropsichiatria Infantile  
Dipartimento di Salute Mentale, Fisica e Medicina Preventiva  
Seconda Università degli Studi di Napoli

# Cefalea e Disabilità

On the World Health Organization's ranking of causes of disability, headache disorders are brought into the **10 most disabling conditions for the two genders**, and into the five most disabling for women

# DISABILITÀ CEFALEA-CORRELATA



The distribution of the Pediatric Migraine Disability Assessment grades in adolescents with different headache diagnoses

# DISABILITÀ CEFALEA-CORRELATA

The 3 subscores and total PedMIDAS scores significantly differed between students who had headache frequencies <7days/month and >7 days/month (*t-test*,  $P < .001$ ) and among the adolescents with different headache intensities (ANOVA,  $P < .001$ )

Items	<7/ month (n = 2200)	≥7/ month (n = 265)	Mild (n = 1548)	Moderate (n = 773)	Severe (n = 144)
School subscore	1.5 +/- 3.9	5.7+/-10.9	1.2+/- 3.2	3.0+/- 7.3	5.1+/- 8.1
Home activity subscore	0.8 +/- 2.1	3.2 +/- 8.4	0.6 +/- 2.1	1.5 +/- 4.4	2.6 +/- 7.1
<b>Play, social,or leisure activity subscore</b>	1.3 +/-3.6	5.4 +/-12.0	1.0+/- 3.2	2.7+/- 6.3	4.8 +/- 12.2
Total score	3.5+/- 8.2	14.3 +/-25.7	2.8+/- 6.9	7.2+/-15.1	12.5+/-23.8

**A) DISABILITA' CRITICA:** disabilità dovuta alla singola crisi cefalalgica, strettamente legata al quadro sintomatologico, alla frequenza ed alla intensità dell'attacco

**B) DISABILITA' INTERCRITICA:**



# Comorbidity

- General medical conditions
- Psychopathological disorders
- Academic disability
- Motor competence



# Condizioni mediche generali

Asma

Febbre da fieno

Otiti ricorrenti

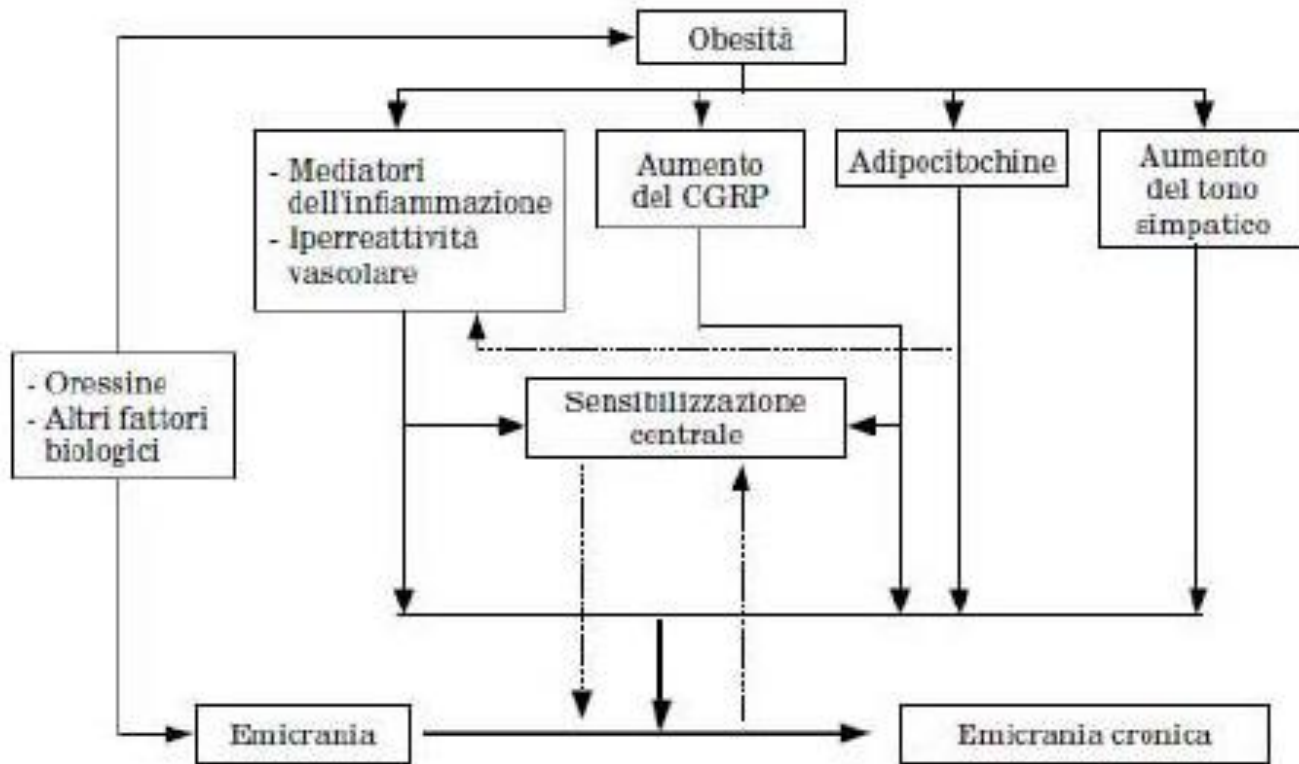
The 41.6% of children with headache had at least one of these conditions, and in general, the group examined had a probability of 3.2 times higher to present two of the above conditions and a probability of 13.6 times greater to submit all three

# Cefalea e Atopia

It was also found a higher comorbidity of headache, in particular migraine, with **atopic disorders** (asthma, rhinitis or eczema), studied in a sample of children presenting with such disorders. The prevalence of migraine was significantly higher in children with atopic disorders than those without. In particular, the greater association was detected with **rhinitis**

# Cefalea e Obesità

- Recent researches suggest that **obesity was significantly correlated with migraine frequency and disability in children**, as well as in adult population studies.
- Translational and basic science research shows **multiple areas of overlap between migraine pathophysiology and the central and peripheral pathways regulating feeding**.
- A relationship between migraine and body mass index exists, and therefore, interventions to modify body mass index may provide a useful treatment model for investigating whether **modest weight loss reduces headache frequency and severity in obese migraineurs**.



*Bigal ME, Lipton RB, Holland PR, Goadsby PJ. Neurology. 2007*

SHORT COMMUNICATION

## Impact of a weight loss program on migraine in obese adolescents

A. Verrotti<sup>a</sup>, S. Agostinelli<sup>a</sup>, C. D'Egidio<sup>a</sup>, A. Di Fonzo<sup>a</sup>, M. Carotenuto<sup>b</sup>, P. Parisi<sup>c</sup>, M. Esposito<sup>b</sup>, E. Tozzi<sup>d</sup>, V. Belcastro<sup>e</sup>, A. Mohn<sup>a</sup> and P. A. Battistella<sup>f</sup>

<sup>a</sup>Department of Pediatrics, University of Chieti, Chieti; <sup>b</sup>Clinic of Child and Adolescent Neuropsychiatry, Second University of Naples, Naples; <sup>c</sup>Department of Child Neurology, II Faculty of Medicine, "La Sapienza" University, Rome; <sup>d</sup>Department of Child Neuropsychiatry, University of L'Aquila, L'Aquila; <sup>e</sup>Department of Neuroscience, Neurology Clinic, Sant'Anna Hospital, Como; and <sup>f</sup>Department of Pediatrics, University of Padua, Padua, Italy

## PEDIATRIC OBESITY

ORIGINAL RESEARCH

doi:10.1111/ijpo.245

## Migraine and obesity: metabolic parameters and response to a weight loss programme

A. Verrotti<sup>1</sup>, M. Carotenuto<sup>2</sup>, L. Altieri<sup>3</sup>, P. Parisi<sup>4</sup>, E. Tozzi<sup>5</sup>, V. Belcastro<sup>6</sup>, M. Esposito<sup>2</sup>, N. Guastaferrò<sup>7</sup>, A. Ciuti<sup>3</sup>, A. Mohn<sup>3</sup>, F. Chiarelli<sup>3</sup> and S. Agostinelli<sup>3,7</sup>

<sup>1</sup>Department of Pediatrics, University of Perugia, Perugia, Italy; <sup>2</sup>Clinic of Child and Adolescent Neuropsychiatry, Second University of Naples, Naples, Italy; <sup>3</sup>Department of Pediatrics, University of Chieti, Chieti, Italy; <sup>4</sup>Child Neurology, La Sapienza University, Rome, Italy; <sup>5</sup>Department of Child Neuropsychiatry, University of L'Aquila, L'Aquila, Italy; <sup>6</sup>Neurology Clinic, Department of Neuroscience, Sant'Anna Hospital, Como, Italy; <sup>7</sup>Pediatric Unit, Ospedale Madonna del Soccorso, San Benedetto del Tronto, Italy; <sup>8</sup>Obstetrics and Gynecology Unit, Ospedale Madonna del Soccorso, San Benedetto del Tronto, Italy

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ORIGINAL RESEARCH

Verrotti A, Agostinelli S, D'Egidio C, et al (2013) European J Neurol 20:394–397  
Verrotti A, Carotenuto M, Altieri L, et al (2014) Pediatr Obes. *In press*

# Disturbi psicopatologici

- Migraine children show more psychological symptoms, detected by using Child Behavior Checklist (CBCL), than healthy controls
- Clinical and population-based studies suggest that, relative to children without headaches, those with migraine are more likely to have symptoms suggestive of anxiety and depression, as well as to have psychological comorbidities.

Ballottin U, Chiappedi M, Rossi M, et al (2011) *Med Hypotheses* 76:778–781

Arruda M, Bigal M. *Cephalalgia*. 2012;32:1093-1100.

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Galli F, D'Antuono G, Tarantino S, et al. *Cephalalgia*. 2007;27:211-219.

Bruijn J, Locher H, Passchier J, et al. *Pediatrics*. 2010;126:323-332.

Anttila P, Sourander A, Metsahonkala L, et al. *J Am Acad Child Adolesc Psychiatry*. 2004;43:412-419.

Virtanen R, Aromaa M, Koskenvuo M, et al. *Pediatrics*. 2004;114:981-987.

# L' ANSIA

- L'ansia è un predittore della persistenza della cefalea primaria.
- La presenza di comorbidità psichiatrica comporta anche una scarsa risposta al trattamento farmacologico della cefalea



# LA DEPRESSIONE

L'insorgenza dell'ansia precede la comparsa della depressione maggiore.

La comorbidità di disturbi depressivi e cefalea è stata osservata più frequentemente nel campione di sesso femminile (75% dei casi), tra i pazienti con una lunga storia di malattia (15 +/- 5 anni) od un'elevata frequenza di attacchi (17 +/- 5 al mese).

It is still a matter of controversy about whether children with migraine have specific psychological vulnerabilities or if they only cope differently with stressful situations.

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## Feature Article

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### **Psychosocial Adjustment of Children With Migraine and Tension-Type Headache – A Nationwide Study**

Marco A. Arruda, MD, PhD; Renato Arruda; Vincenzo Guidetti, MD; Marcelo E. Bigal, MD, PhD

- Children with EM are more likely to present **emotional symptoms**, conduct problems, hyperactivity, peer problems, and total **difficulties in psychosocial adjustment**
- Children with ETTH were significantly more likely to have **emotional symptoms** and total difficulties causing impact in their **psychosocial adjustment** compared with controls
- Compared with children with ETTH, children with EM were significantly more likely to have abnormal score in all but one SDQ scale (prosocial behavior problems score)

# Ruolo della genitorialità

**Table 2** Mean differences in Parenting Stress Index-Short Form scores between children affected by migraine without aura and controls

	MoA n = 218	Controls n = 405	P
PD	41.93 ± 7.12	26.94 ± 5.44	<0.001
PCDI	33.97 ± 4.79	22.18 ± 3.05	<0.001
DC	24.58 ± 2.93	22.96 ± 3.19	<0.001
DEF	14.01 ± 3.27	13.96 ± 4.19	NS
Total stress	101.38 ± 7.81	65.27 ± 4.39	<0.001

**Notes:** The t-test and Chi-square test were applied as appropriate;  $P < 0.05$  were considered statistically significant.

**Abbreviations:** PD, Parental Distress domain; PCDI, Parent-Child Dysfunctional Interaction domain; DC, Difficult Child subscale; DEF, defensive responding subscale; MoA, migraine without aura; NS, not significant.

# Personalità materna

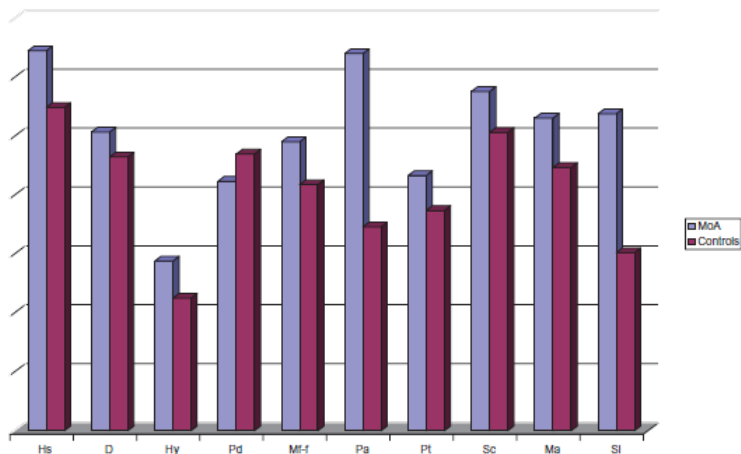


Figure 1 Comparisons in MMPI-2 clinical basic scales results between mothers of MoA children and mothers of control children.  
Abbreviations: MMPI-2, Minnesota Multiphasic Personality Inventory – second edition; MoA, migraine without aura; Hs, hypochondriasis; D, depression; Hy, hyst Pd, psychopathic deviate; Mf-I, masculinity/femininity; Pa, paranoia; Pt, psychasthenia; Sc, schizophrenia; Ma, hypomania; Si, social introversion.

Le madri dei bambini affetti da Emicrania presentano un profilo di personalità peculiarmente differente rispetto alle madri dei bambini non affetti

Le peculiarità personologiche delle madri correlano in maniera significativa con le caratteristiche cliniche della emicrania quali frequenza ed intensità degli attacchi

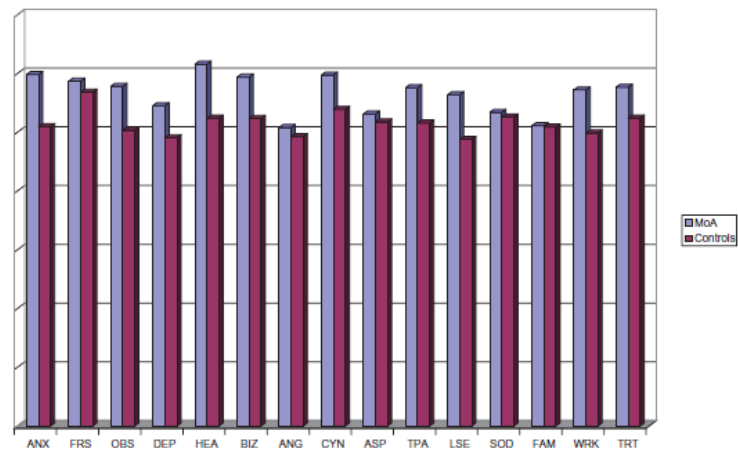


Figure 2 Comparisons in MMPI-2 content scales results between mothers of MoA children and mothers of control children.  
Abbreviations: MMPI-2, Minnesota Multiphasic Personality Inventory – second edition; MoA, migraine without aura; ANX, anxiety; FRS, fears; OBS, obsessiveness; DEP, depression; HEA, health concerns; BIZ, bizarre mentation; ANG, anger; CYN, cynicism; ASP, antisocial practices; TPA, type A; LSE, low self-esteem; SOD, social discomfort; FAM, family problems; WRK, work interference; TRT, negative treatment indicators.

# Stili di Attaccamento

**Table 1** The attachment styles of the study subjects

	MoA (N=219) (%)	Controls (N=381) (%)	Chi-square	P-value
Type A	36.07	14.96	34.168	<0.001
Type B	22.37	48.82	39.714	<0.001
Type C	25.11	23.09	0.210	0.646
Type D	16.44	13.12	0.989	0.320

**Notes:** The table shows the differences in the prevalence of each attachment style between the MoA children and typical developing children (Controls); specifically, according to Bowlby's attachment theory,<sup>39-40</sup> four attachment style (types) are possible: insecure/avoidant (type A); secure (type B); insecure/ambivalent (type C); and disorganized/confused (type D). The chi-square test was applied; P-values<0.05 were considered statistically significant.

**Abbreviation:** MoA, migraine without aura.

I bambini affetti da emicrania presentano una maggiore rappresentazione di modalità di attaccamento evitante (Tipo A) ed una riduzione significativa della prevalenza di attaccamento sicuro (Tipo B)

# Aspetti Temperamentali

**Table 1** Comparison between children affected by MoA and typical children on the Junior Temperament and Character Inventory: Parent Version

	MoA (N = 486) (%)	Controls (N = 518) (%)	Chi-square value	P-value
NS high levels	37.45	43.05	3.041	0.081
HA high levels	63.17	39.58	54.913	<0.001
RD high levels	42.59	47.68	3.400	0.065
P high levels	64.61	38.03	69.814	<0.001
SD high levels	46.30	53.67	5.159	0.023
C high levels	51.85	57.53	3.037	0.081
ST high levels	54.32	52.70	0.203	0.652

**Notes:** Table 1 shows the differences in prevalence of high levels in the domains of the Junior Temperament and Character Inventory: Parent Version questionnaire between children affected by MoA and typical developing children (controls). Specifically, according to Cloninger's model, four temperament dimensions (NS, HA, RD, and P) and three higher order character dispositions (SD, C, and ST) were considered. P-values < 0.05 were considered to be statistically significant.

**Abbreviations:** C, cooperativeness; HA, harm avoidance; MoA, migraine without aura; NS, novelty seeking; P, persistence; RD, reward dependence; SD, self-directedness; ST, self-transcendence.

Individuals with high values in HA tend to be cautious, careful, fearful, tense, apprehensive, nervous, timid, doubtful, discouraged, insecure, passive, negativistic, or pessimistic even in situations that do not normally worry other people. Consequently, these individuals tend to be inhibited and shy in most social situations, with low energy level and chronic self-perception of tiredness.

Significant direct relationship between HA score and frequency ( $p < 0.001$ ) and intensity ( $p < 0.001$ ) of attacks.

# Stima di Sè

**Table 1** MSCS scores, in patients with MoA and controls

	<b>MoA (N = 185)</b>	<b>Controls (N = 203)</b>	<b>P-value</b>
Social	65.712 ± 24.791	96.073 ± 18.591	<0.001
Competence	91.426 ± 18.295	90.971 ± 19.011	0.811
Affect	76.049 ± 11.914	98.856 ± 12.087	<0.001
Academic	91.094 ± 11.381	93.014 ± 11.948	0.107
Family	71.643 ± 12.426	99.815 ± 13.041	<0.001
Physical	67.931 ± 21.653	92.057 ± 19.762	<0.001
Global score	68.629 ± 23.016	94.182 ± 16.849	<0.001

**Notes:** The table shows the comparison of mean distribution in specific domains and in the global score of the MSCS, between subjects with MoA and typically developing subjects (controls). The t-test was applied. *P*-value ≤0.05 was considered statistically significant.

**Abbreviations:** MoA, migraine without aura; MSCS, Multidimensional Self-Concept Scale.

MoA frequency and duration were significantly negatively related with the Social, Competence, Physical, and total scores of the MSCS.

# Disabilità scolastica



# ABILITÀ INTERCRITICA

(Dal Punto di vista dell' Insegnante)

## EMICRANIA

- È attento
- Ha un ottimo lessico
- È preciso nei compiti
- Ha buona memoria
- È il primo della classe

## CEFALEA TENSIVA

- È distratto
- È sonnolento
- È disordinato
- È goffo
- È lento negli apprendimenti
- È volenteroso ma....

# ABILITÀ INTERCRITICA

(Dal Punto di vista del bambino)

## EMICRANIA

- Sono bravo a scuola
- Riesco a seguire bene le lezioni
- Ricordo bene le spiegazioni
- Non ho problemi a fare i compiti da solo
- Mi piace giocare ai videogames
- Mi piace leggere

## CEFALEA TENSIVA

- Non riesco a stare ben attento
- Sono stanco
- Spesso dimentico le spiegazioni
- Non riesco a capire le spiegazioni quando sono troppo lunghe
- Faccio fatica a fare i compiti
- Mi piace giocare con gli amici

# DISABILITÀ INTERCRITICA

Le capacità di apprendimento dei soggetti affetti da cefalea nei periodi liberi da crisi sono diverse da quelle dei soggetti sani?

# K-ABC Standardized Scores

Differences between patients with migraine and their non-affected siblings  
(*t*-test for unpaired samples, means and SD).

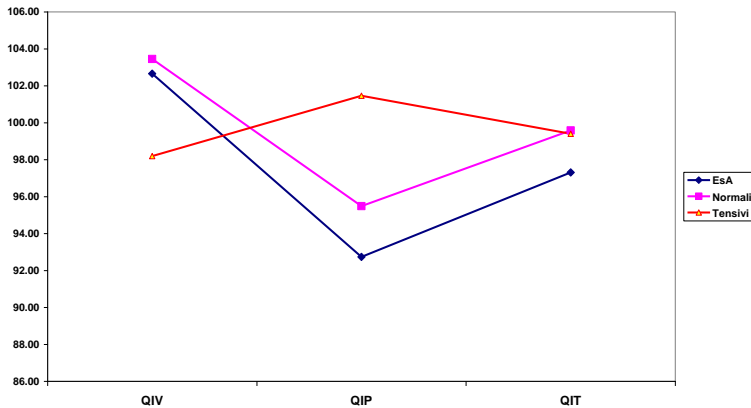
Cognitive Scales (standardized scores)	Patients with Migraine [ <i>n</i> 37; mean (SD)]	Controls [ <i>n</i> 17; mean (SD)]	Significance (two-tailed)
SEQ	100.0 (12.7)	97.0 (15.5)	n.s.
SIM	108.1 (11.0)	104.8 (10.7)	n.s.
MPC	104.8 (9.8)	101.3 (11.1)	n.s.

## Scores at neurocognitive assessment by WISC-R

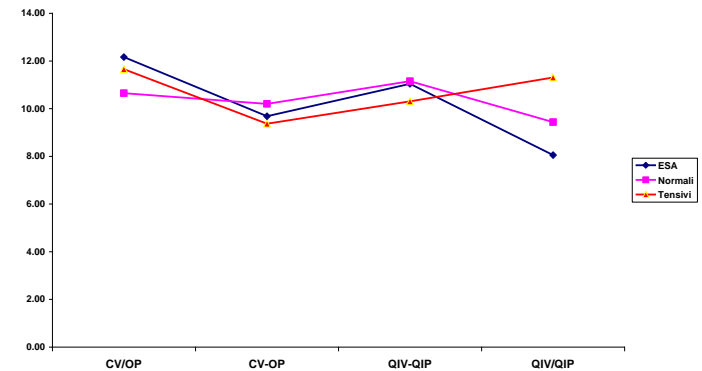
WISC-R variables	Group A (control group) ( <i>n</i> = 79)		Group B MoA children ( <i>n</i> = 63)		Group C TTH children ( <i>n</i> = 19)		ANOVA <i>p</i>	Scheffe <i>p</i>		
	Mean	SD	Mean	SD	Mean	SD		0 vs. 1	0 vs. 2	1 vs. 2
TIQ	115.8	10.6	108.1	13.2	110.6	15.7	<0.001	<0.001	NS	NS
VIQ	118.2	11.8	108	14.8	108.9	15.6	<0.000	<0.000	<0.02	NS
PIQ	110.1	11.2	106.1	13.8	110	14.9	NS	NS	NS	NS
Information	11.5	2.6	9.5	2.8	9.9	3.2	<0.000	<0.000	NS	NS
Similarities	13.1	3	11.5	3.4	11.5	4.1	<0.01	<0.02	NS	NS
Arithmetic	12.1	2.5	11.2	3.2	11	2.1	NS	NS	NS	NS
Vocabulary	15.5	2.2	14	3.3	14.3	4.3	<0.01	<0.02	NS	NS
Comprehension	12.4	2.4	10.4	2.8	9.5	2.5	<0.000	<0.000	<0.000	NS
Picture completion	11.6	2.6	9.9	2.9	10.2	2.5	<0.001	<0.001	NS	NS
Picture stories	10.9	2.4	11.7	2.5	11.8	3.3	NS	NS	NS	NS
Block design	11.2	2.3	11.2	2.9	11.5	3.2	NS	NS	NS	NS
Puzzles	11.9	2.6	11.4	2.8	11.6	2.8	NS	NS	NS	NS
Coding	11.9	2.4	10.6	3.6	10.9	2.2	<0.02	<0.03	NS	NS

# Can headache impair intellectual abilities in children? An observational study

Profilo intellettivo



Analisi fattoriale di Kaufman



**Table 2** Mean and standard deviation for cognitive indices in children with migraine without aura or tension-type headache, and control children

	MoA (n = 75)	TTH (n = 72)	Control (n = 137)	P*		
				MoA versus normal	TTH versus normal	MoA versus TTH
VIQ	102.65 ± 15.44	98.58 ± 10.51	105.31 ± 13.44	1.35	0.002	0.453
PIQ	92.73 ± 14.51	101.42 ± 14.28	95.02 ± 13.58	1.775	0.012	0.002
FIQ	97.31 ± 16.39	99.63 ± 11.80	100.23 ± 12.49	1.027	5.134	2.293
VC	104.76 ± 18.74	99.12 ± 9.80	103 ± 13.12	2.979	0.198	0.171
PO	91.42 ± 13.95	99.47 ± 13.58	96.6 ± 11.99	0.035	0.829	0.003
VC-PO	13.34 ± 16.56	-0.34 ± 14.25	6.4 ± 12.52	0.005	0.003	0.000
VIQ-PIQ	9.92 ± 8.38	-2.83 ± 14.17	10.4 ± 15.88	5.65	0.000	0.000

Note: \*Bonferroni-corrected value.

Abbreviations: MoA, migraine without aura; VIQ, verbal intelligent quotient; PIQ, performance intelligent quotient; FIQ, full intelligent quotient; TTH, tension-type headache; VC, verbal comprehension; PO, perceptual organization.

# LA COORDINAZIONE MOTORIA





# COORDINAZIONE MOTORIA

A  
Z  
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O  
N  
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M  
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O  
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I  
E

UTILI ALLO SCOPO

ARMONICHE

ECONOMICHE



# Developmental Coordination Disorder (DCD)

- Segni neurologici minori
- Goffaggine motoria
- Prevalenza fino al 19%



# DSM-5

1. Capacità di coordinazione motoria al di sotto delle aspettative per età e grado di intelligenza
2. Interferisce con gli apprendimenti accademici e le attività quotidiane
3. Non è dovuto ad una condizione medica generale (es. PCI) e non risponde ai criteri per un disturbo pervasivo dello sviluppo
4. Nel caso di Ritardo Mentale le abilità motorie risultano al di sotto delle aspettative per età mentale

# MOVEMENT ABC TEST

## VALUTAZIONE DELLA COORDINAZIONE MOTORIA





ABILITÀ CON LA PALLA



EQUILIBRIO



DESTREZZA MANUALE

M  
O  
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A  
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T

## Motor coordination impairment and migraine in children: a new comorbidity?

Maria Esposito · Alberto Verrotti ·  
Francesca Gimigliano · Maria Ruberto ·  
Sergio Agostinelli · Goffredo Scuccimarra ·  
Antonio Pascotto · Marco Carotenuto

	MoA (N=27)	Normal (N=59)	p*
Sex Ratio (M/F)	11/16	25/34	NS
Age	8.704 ± 2.145	8.0 ± 2.101	NS
z-BMI	1.427 ± 0.518	1.539 ± 0.475	NS
Total-IQ	102.14 ± 8.37	103.58 ± 9.28	NS
<b>M-ABC Dexterity</b>	<b>4.611 ± 2.883</b>	<b>2.305 ± 2.226</b>	<b>0.001</b>
M-ABC Ball skills	2.111 ± 1.565	1.746 ± 1.244	NS
<b>M-ABC Balance</b>	<b>3.204 ± 2.020</b>	<b>1.492 ± 1.321</b>	<b>&lt;0.001</b>
<b>M-ABC Total score</b>	<b>9.926 ± 4.028</b>	<b>5.542 ± 2.973</b>	<b>&lt;0.001</b>
<b>M-ABC Centile</b>	<b>20.667 ± 19.549</b>	<b>44.390 ± 23.044</b>	<b>&lt;0.001</b>
VMI Total Score	31.630 ± 17.592	34.000 ± 22.256	NS
VMI Visual Task	56.037 ± 25.458	58.776 ± 24.491	NS
<b>VMI Motor Task</b>	<b>5.259 ± 4.053</b>	<b>26.022 ± 22.055</b>	<b>&lt;0.001</b>

# Emicrania Fattore Di Rischio Per DCD?

	MoA (N=27)	Normal (N=59)	Chi-square	p	OR	IC 95%
<b>M-ABC patologica</b>	<b>6/21</b>	<b>1/58</b>	<b>7.874</b>	<b>0.005</b>	<b>16.5714</b>	<b>1.8825-145.8783</b>
<b>M-ABC Borderline</b>	<b>11/16</b>	<b>4/55</b>	<b>12.572</b>	<b>&lt;0.001</b>	<b>9.4531</b>	<b>2.6478-33.7497</b>
<b>VMI Total Score</b>	4/23	7/52	0.001	0.974	1.2919	0.3441-4.8502
<b>VMI Visual Task</b>	1/26	8/51	0.039	0.844	2.2308	0.1343-37.0606
<b>VMI Motor Task</b>	<b>17/10</b>	<b>8/51</b>	<b>19.596</b>	<b>&lt;0.001</b>	<b>10.8375</b>	<b>3.6816-31.9021</b>

# Take Home Messages

- La cefalea non è esclusivamente una sindrome algica
- Le comorbidity che la accompagnano condizionano notevolmente la QoL dei bambini incrementando frequenza ed intensità degli attacchi
- La corretta gestione delle diverse comorbidity migliora significativamente l'outcome

*...miett e criature o sole, pecchè hanna capì addò fa friddo e addò fa cchiù calore!*



*Grazie*