Journal Reading:

Headache and cognitive profile in children: a cross-sectional controlled study

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ORIGINAL

Headache and cognitive profile in children: a cross-sectional controlled study

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Introduction

- Cognitive impairment in tests of perception, visual attention, information speed processing, simple reaction time (RT) and verbal ability have been documented in migraine subjects.
- There is empirical evidence that patients with migraine, including those with aura, do not have a higher risk of long-term neuropsychological impairment.

Introduction

- few studies available on cognitive dysfunction in pediatric headache have yielded contrasting results
  - a migraine-free control group was not used
  - the nature of the neuropsychological tests administered
    - too broad
    - only a highly specific cognitive function

Introduction

- administering the Wechsler Intelligence Scale for Children-revised (WISC-R) in a cross-sectional controlled study
- children affected by either MoA or TTH
  - never taken anti-migraine therapy exhibited different intellectual functioning
- compared with a headache-free control group mateched by
  - age
  - culturally
  - socioeconomically.

Patients and Methods

134 Childrens (93 MoA, 41 TTH)

from January 2006 to November 2008 at the Child Neurology Outpatient Service, Paediatric Chair of the Second Faculty of Medicine, "La Sapienza" University in Rome, Italy

age between 6 and 16 years

Primary headache

- Other systemic disease
- Major psychiatric disorder
- Association of different types of headache
- anamnesis of previous antimigraine prophylaxis therapy
- alterations in the neuroradiological (MRI), neurophysiological (EEG) or blood chemistry test findings
- any type of anomaly detected at the neurological examination

82 subjects (34 males, 48 females)

63 MoA, 19 TTH

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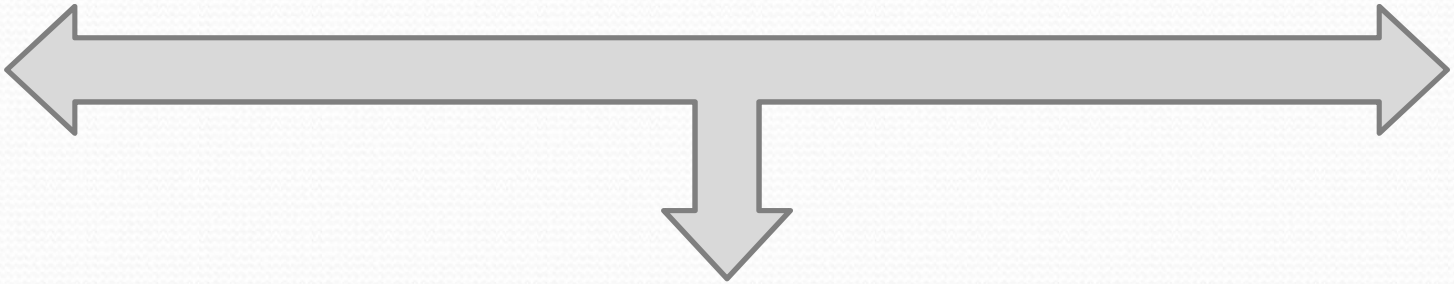
Case: 82
63 MoA(25m, 38F)
19 TTH (9m, 10F)

- Age
- Sex
- BMI
- Racial
- Socioeconomic status
- Family education background
- Time missed at school

Control: 79
Health childrens
(27M, 52F)



- WISC-R
- MRI of the brain
- Blood chemistry analyses
- Comprehensive NE
- EEG

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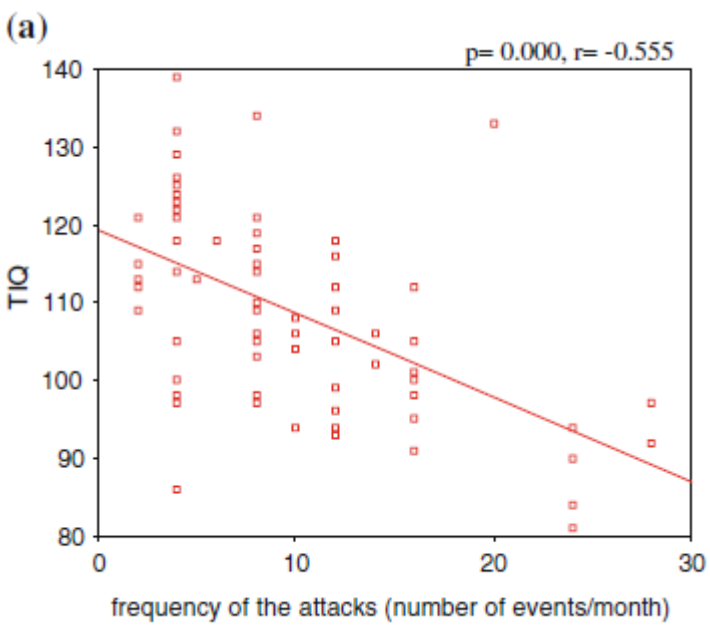
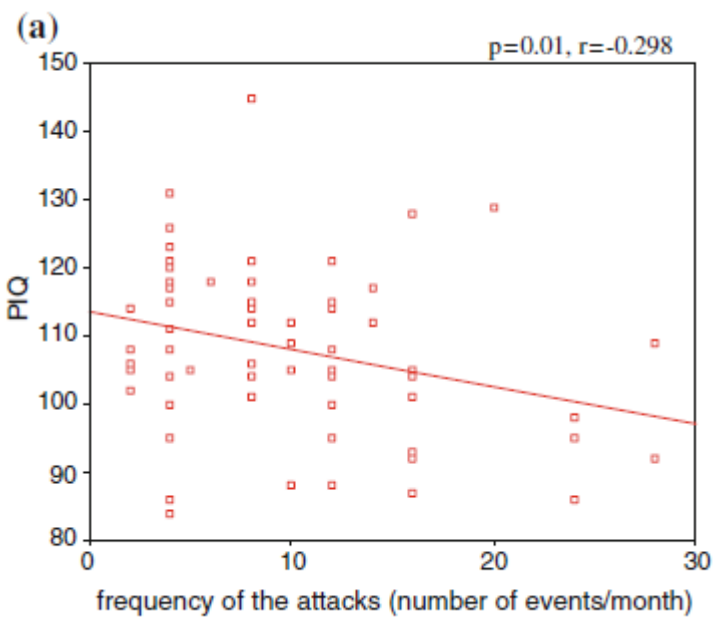
Table 1 Anthropometric and clinical characteristics

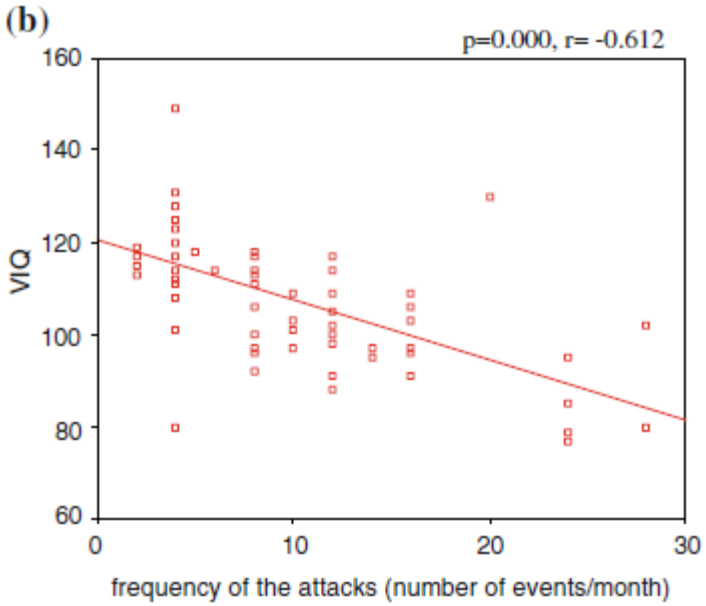
	Group A (control group) (n = 79)		Group B MoA children (n = 63)		Group C TTH children (n = 19)		Anova $p<$	Sheffe $p<$		
	Mean	SD	Mean	SD	Mean	SD		0 vs. 1	0 vs. 2	1 vs. 2
Age (years)	10.04	2.4	11.0	2.9	10.8	2.7	NS	NS	NS	NS
Centile BMI (kg/m^2)	60.4	6.8	64.3	6.2	59.1	9.4	NS	NS	NS	NS
Duration of disease (years)	–	–	2.2	2.1	2.3	1.8	NS	–	–	–
Age at onset	–	–	9.2	6.4	8.6	3.4	NS	–	–	–
Frequency of the attacks (events/month)	–	–	9.7	5.4	9.8	5.7	NS	–	–	–
	n	%	n	%	n	%				χ^2 ($p<$)
Sex (male)	27	34.2	25	39.7	9	47.4				NS

Table 2 Scores at neurocognitive assessment by WISC-R

WISC-R variables	Group A (control group) (n = 79)		Group B MoA children (n = 63)		Group C TTH children (n = 19)		ANOVA p	Sheffe p		
	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


(a)
p= 0.000, r= -0.555
TIQ
frequency of the attacks (number of events/month)


(a)
p=0.01, r=-0.298
PIQ
frequency of the attacks (number of events/month)


(b)
p=0.000, r= -0.612
VIQ
frequency of the attacks (number of events/month)

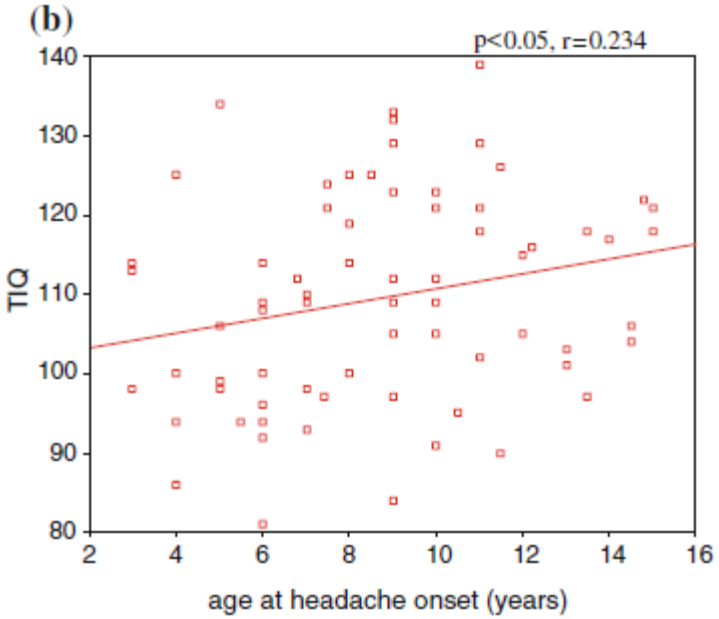

(b)
p<0.05, r=0.234
TIQ
age at headache onset (years)

Table 3 Stepwise linear multiple regression models investigating TIQ, VIQ and PIQ separately as dependent variables, and the headache subtypes, frequency of the attacks, the duration of the patient's history and the age at onset as independent variables

Independent variables	Dependent variables					
	TIQ		VIQ		PIQ	
	Standardized coefficients beta	*p*	Standardized coefficients beta	*p*	Standardized coefficients beta	*p*
Frequency (events/month)	−0.551	0.000	−0.607	0.000	−0.301	0.012
Age at headache onset	−0.069	0.05	0.207	0.065	0.177	0.190
Duration of disease	0.224	0.548	−0.053	0.634	−0.061	0.649
Headache subtypes	0.088	0.380	0.028	0.770	0.145	0.220

Disscusion

Personality and memory in childhood migraine. Cephalalgia 9:25–28

- based on a cohort of 20 children with migraine, aged 7–11 years
- intelligence, digit span and visual–motor integration were normal
- performance in short- and long-delayed memory tasks was significantly impaired.

Disscusion

Cognitive development in children with migraine and their unaffected siblings.
Headache 42:776–779

- aged 6–12 years with migraine were compared with their healthy siblings
- not reveal any significant differences on a scale assessing sequential and simultaneous information processing

Disscusion

Migraine and cognitive function.A life-course study. Neurology 59:904–908

- A longitudinal study conducted on migraineurs from the age of 3 to 26 years reported impaired verbal skills in migraineurs compared with the control group;

Disscusion

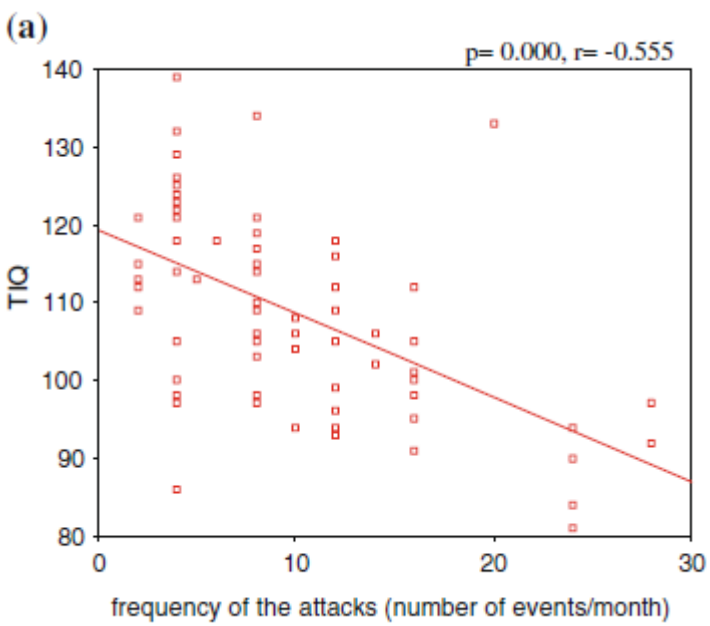
Cognitive and behavioural effects of migraine in childhood and adolescence. Cephalalgia 26:596–603

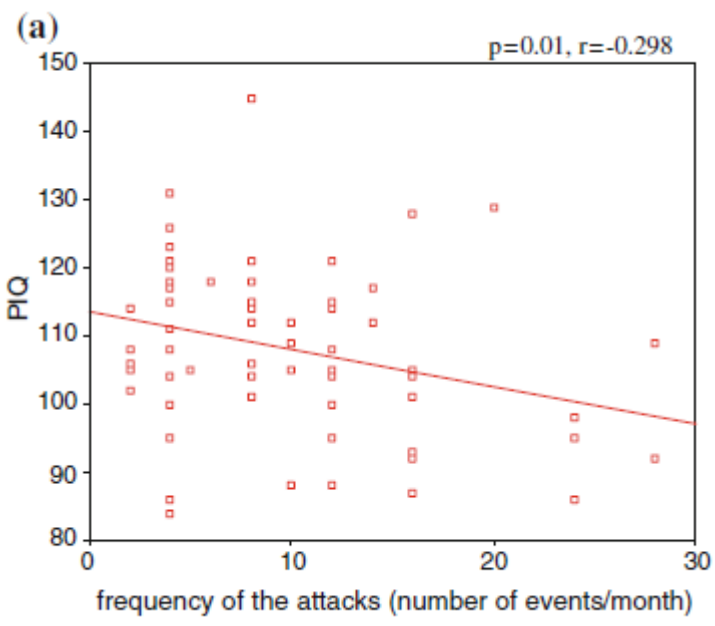
- a significant dysfunction in the information processing rate alone.
- The simple reaction time (RT) to visual stimuli was slow in a significantly larger number of migraineurs than in the normal population

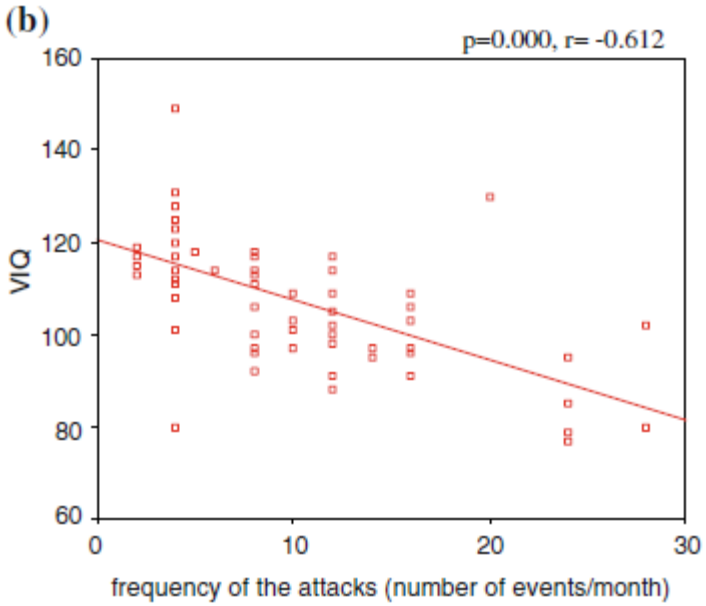
Disscusion

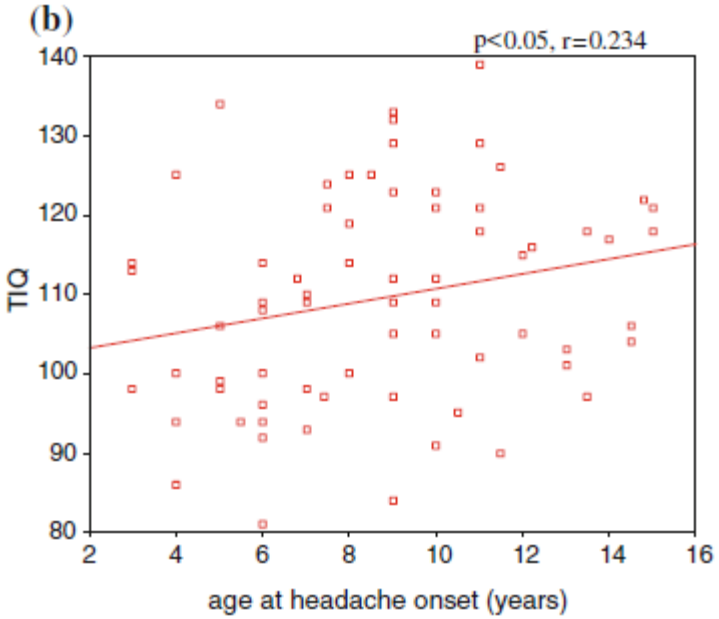
Visual attention in children with migraine: a controlled comparative study. Cephalalgia [Epub ahead of print]. doi:10.1111/ j.1468-2982.2008.01767.x]

- Children with migraine in that study exhibited an impairment in all the variables except the RT in the visual attention test tasks, when compared with controls.
- The neurochemical aspects involved in the physiopathology of migraine and attention mechanisms probably predispose these children to visual attention deficits.


(a)
p= 0.000, r= -0.555
TIQ
frequency of the attacks (number of events/month)


(a)
p=0.01, r=-0.298
PIQ
frequency of the attacks (number of events/month)


(b)
p=0.000, r= -0.612
VIQ
frequency of the attacks (number of events/month)


(b)
p<0.05, r=0.234
TIQ
age at headache onset (years)

Disscusion

- Weak points
  - Lack of a control group with pain other than migraine/headache
  - Type of study design
  - Good scores of IQ in the control group

Discussion

- the most relevant data from our study is that the only significant independent variable for cognitive performances was the frequency of attacks.