

Study on Food Intolerance in Children with Mental Retardation

Geng Xiang-ju, Shang Qing, Zhang Yan-min, Li Wei-meng

Department of Rehabilitation Medicine, Children's Hospital of Zhengzhou, Zhengzhou 400053, Henan Province, China

gengxiangjua@163.com

Abstract: Objective: To research treatment efficacy between food intolerance and diet intolerance among mental retardation children. **Methods:** 168 subjects were divided into two groups; one had 148 mental retardation children, the other 20 healthy children. ELISA was used to detect 14 kind food allergen IgG levels in serum for both groups, compared results. The 116 subjects (34 out-patients, 82 in-patients) with food allergen positive were grouped into three: one out-patient group and two in-patients groups. The 34 cases of out-patient group were treated with simple diet intolerant food with regular follow-ups for six months. The other two groups were divided equally among in-patient subjects: both groups were treated with a period of six months: but one group with combined treatment of rehabilitation plus diet intolerant food; the other with rehabilitation alone. **Results:** The antibody levels of food allergen-specific IgG among mental retardation children are significant higher than the ones among the healthy children ($P < 0.05$). Followed-up 34 cases of out-patients, symptoms of mental retardation improved compared to condition before treatment, developmental quotients improved compared to previous recorded quotient; before and after treatment differences are statistically significant ($P < 0.05$). Among 82 cases of in-patients, symptoms of mental retardation improved and developmental quotients improved drastically. The difference shows statistically significant ($P < 0.05$). **Conclusions:** Food allergen-specific IgG antibody detection can help early detection of food intolerance in mental retardation children; and diet intolerance treatment has some significant efficacy for mental retardation children.

[Geng Xiang-ju, Shang Qing, Zhang Yan-min, Li Wei-meng. **Study on Food Intolerance in Children with Mental Retardation.** *Life Sci J* 2014; 11(11):853-856]. (ISSN: 1097-8135). <http://www.lifesciencesite.com>. 152

Key words: mental retardation; food intolerance; IgG antibody; children

Introduction

Mental retardation is also known as intellectual disability or Hypoplasia. It is a common developmental disorder in children, also the leading cause of permanent disability in children. The cause of the disease is not yet clear so far. Scientists have found that body immune system abnormal responses to food intolerance play an important role in the pathogenesis. According to British Allergy Association statistics, almost all systematic diseases are associated with food intolerance^[1], improving diet structure will shorten recovery period of diseases. Previous studies also suggested that children with autism and metal abnormalities were closely related to food intolerance; to some extent, diet intolerance can improve symptoms of autism^[2]. This study examined food intolerance in children with mental retardation, investigated the efficacy of diet indolence among these children.

1. Materials and Methods

1.1 General Materials

The 148 cases of mental retardation group were selected from in-patients and out patients, who seek treatments from our neurological rehabilitation ward among January 2009 to December 2011. There were 86 males, 62 females with age range from one

year old to six year old. All subjects met diagnostic criteria for mental retardation, defined in CCMD-3^[3], assessed on developmental quotient utilized neuropsychological development scale test. Developmental quotient categories: Mental retardation is defined as Intelligence quotient (IQ) / developmental quotient (DQ) < 70 minutes, accompanied by social adaptability defects. It is categorized as following: Mild: $55 \leq IQ (DQ) < 70$, Moderate: $40 \leq IQ (DQ) < 55$, Severe: $25 \leq IQ (DQ) < 40$, Very severe: $IQ (DQ) < 25$. According to international standard, moderate, severe, very severe are categorized as Severe Mental Retardation. The 20 cases in healthy control group were children volunteers from the same period of time, agreed upon the clinical trial. General information of these two groups, such as age, financial background, parents education, family history are all comparable ($P_a > 0.05$). The subjects from mental retardation group were excluded from organic diseases via EEG, head CT, chromosomal, genetic and metabolic screening of urine, blood biochemistry and thyroid function test, etc.

1.2 Methods

1.2.1 Food allergen-specific IgG antibody detection: Investigated the relationship between food and symptoms for both groups, tested food intolerance at the same time. The two group subjects were prohibited

to intake any anti-allergy drugs, drawn peripheral venous blood samples. Those blood samples were bathed in warm water for 4-6 hours, centrifuged 5 minutes in 3600 min. The serum specimens were extracted from blood sample and preserved in -20 ° C refrigerator. ELISA was used to detect allergen-specific IgG antibodies of 14 kinds of food (chicken, beef, pork, cod, crab, shrimp, corn, eggs, mushrooms, milk, rice, soybeans, tomatoes, wheat). The test kits were provided by the U.S. BIOMERICA company.

1.2.2 Treatment and developmental quotient in mental retardation: The 116 subjects (34 out-patients, 82 in-patients) with food allergen positive were divided into three groups. The 34 out-patients (24 mild cases, 10 severe cases) were in one group, which were treated with diet intolerance food for six months, and followed up on a regular basis. The 82 in-patients were grouped into two; one (a.k.a. combined-treatments group) has 41 subjects (28 mild cases, 13 severe cases) who were treated with combined rehabilitation and diet intolerance food; the other (a.k.a. single-treatment group) 41 subjects (30 mild cases, 11 severe cases) were treated with rehabilitation alone. Other related rehabilitation treatments were all the same. All three groups were closely observed and recorded with

regards symptoms and score in development quotient for before and after treatment.

1.3 Statistical Process

SPSS (15.0) software was utilized, data was measured by $\pm s$, t test was used, statistic data using χ^2 test, $P < 0.05$ was considered statistically significant.

2. Results

Table 1 indicates the number of cases with allergen-specific IgG positive between mental retardation group and healthy control group. Table 2 indicates the number of cases with food sIgG antibody positive between mental retardation group and healthy control group. Table 3 indicates developmental quotient before and after treatments for out-patients with mental retardation. DQ shows improvement after six month treatment. It shows statistical significant. Table 4 indicates no significant difference for in-patients groups between combined-treatments group and single-treatment group before treatment. Table 5 indicates subject's developmental quotients for combined-treatment group are improved more significant than single-treatment group after treatment; the comparison between those two groups has statistical significance.

Table 1 The number of cases with allergen-specific IgG positive between mental retardation group and healthy control group

group	n	beef	chicken	gadus	corn	crab	egg	mushrooms
mental retardation group	148	19(12.8)	21(14.1)	27(18.2)	17(11.5)	28(18.9)	112(75.6)	6(4.0)
healthy control group	20	0	0	0	0	0	2(10.0)	0

group	n	milk	pig	rice	prawn	soy	tomato	wheat
mental retardation group	148	101(68.2)	4(2.7)	5(3.4)	62(41.9)	30(20.3)	38(25.7)	31(20.9)
healthy control group	20	1(5.0)	0	0	0	0	0	0

Table 2 The number of cases with food sIgG antibody positive between mental retardation group and healthy control group

group	n	Positive level				positive[n(%)]	x ²	P
		-	+	++	+++			
mental retardation group	148	32	26	54	36	116(78.3)	31.26	<0.01
healthy control group	20	17	2	1	0	3(15.0)		

Table 3 Developmental quotient before and after treatments for out-patients with mental retardation

group	n	Mildly abnormal	Severely abnormal
Before treatments	34	61.96±3.63	44.20±6.39
After treatments	34	67.50±3.68	49.70±6.86
t		18.06	8.409
P		<0.05	<0.05

Table 4 Developmental quotient before treatments for in-patients groups between combined-treatments group and single-treatment group

group	n	Mildly abnormal	Severely abnormal
combined-treatments group	41	61.89±3.54	45.23±4.95
single-treatment group	41	62.50±3.50	46.27±5.29
t		0.66	0.50
P		>0.05	>0.05

Table 5 Developmental quotient after treatments for in-patients groups between combined-treatments group and single-treatment group

group	n	Mildly abnormal	Severely abnormal
combined-treatments group	41	70.93±3.76	56.54±5.16
single-treatment group	41	67.67±3.18	51.64±5.73
t		3.58	2.21
P		<0.05	<0.05

3. Discussions

Mental retardation, also known as intellectual disability, is a common developmental disorder in children, characterized by significantly impaired cognitive function, intellectual disability and poor behavior; Developments for mental retardation children on language, attention, memory, understanding, insight, abstract thinking, imagination and other mental activity are significantly behind normal children. It is a common concern among experts on clinical medicine, rehabilitation medicine, psychology, educational and

social workers ^[4]. Children with mental retardation often exhibit growth retardation of speech, expression ability, slow perception, poor memory, childish, emotional instability, lack of self-control, impulsive, timid, withdrawn, shy and so on. The ratio of mental retardation worldwide is of 1% -2%, nationwide is of 1.2% for age 0-14; 0.75 is in city, 1.41% urban. The gender ratio is 1.24% for male, 1.16% for female; there was no statistical difference ^[5].

It is believed that the cause of mental retardation is very complex. It includes: 1). Genetic, metabolic and

abnormalities such as genetic, chromosomal abnormalities, brain malformations; 2). Harmful effects during pregnancy such as infections, drugs and toxic substances, tobacco, alcohol, environmental chemicals, X-ray irradiation, inadequate maternal nutrition, maternal health, mechanical damage, emotional factors, etc. 3). Harmful factors during early development of children, such as the central nervous system infections, nuclear encephalopathy, cerebral anoxia, acquired adverse psychological and social factors, etc [6]. The morbidity of this disease is high and seriously affects the quality of the population, put a heavy burden to families and society. Early detection, early diagnosis and early treatment are keys to improve mental retardation children's intelligence and physical developments [7], and to carry out our nation policy of eugenics [8].

In recent years, many laboratories in European confirmed the correlations among food intolerance, food consumption of specific foods and artificial food preservatives, such as irritable bowel syndrome [9], lactose intolerance, etc. Food intolerance is not simple food allergy and simple allergy symptoms such as asthma, skin rashes, purpura, etc. as we have understood before. Food intolerance can cause chronic symptoms in all organs, including the respiratory, digestive, skin, neurological, psychiatric, metabolic, and genitourinary. The mechanism is that food can provide energy only after digestion. But many foods cannot be fully digested due to lack of enzymes; Human body identifies food as foreign substances, produces specific antibodies [10], and hence forms immune system complex and damage organs.

This study found 116 cases of IgG positive among 148 children with mental retardation. Some children were allergic to multiple foods; the healthy control group only had three cases of IgG-positive; the difference was statistically significant ($P < 0.05$). It is highly speculated that food intolerance may be one of causes of mental retardation. Grouped 116 cases of subjects with IgG positive into three: the 34 cases of out-patients were treated with diet intolerant food only for a period of six months with follow-ups on a regular basis; it has been proved that symptoms were improved, so were developmental quotients, it has statistical significance. The 86 cases of in-patients were divided into two groups with both treatments for a period of six months: the symptoms were improved more among severe retardation groups with combination of treatment than single treatment alone, developmental quotients were improved dramatically, and show statistical significance. It is concluded that diet intolerance food had some significant efficacy on treatment for mental retardation.

Although we found food intolerance can significantly improve symptoms and developmental quotient of mental retardation, but low levels of IgG antibodies of different food ingredients can be detected in healthy children too [11]. It needs further research on what kind of role food IgG antibodies play, and what level the IgG antibodies can reach in mental retardation. Due to the limited number of observed cases in this study, the positive

results of the relationship between mental retardation and dietary effects of structural adjustment cannot be conclusive, it is in need for a large samples of clinical observation. But early detection of IgG antibody and diet intolerance treatment according to test results has some significance for mental retardation.

Henan key projects for health science and technology development in 2010 (Health Department), Project number : 201004019

References

1. Xu Yonghao, Wang Junpu, Tang Faqing. 100 patients with food allergy food intolerance IgG antibody detection [J]. Practical preventive medicine, 2009,16 (1) : 38-41.
2. Geng Xiangju, Wu Li, Song Lijia. Study on Food Intolerance in Children with Autism and the Curative Effect of Avo iding Intolerance Food [J]. Journal of applied clinical pediatrics, 2010,25 (7) : 511-512.
3. Guo Lanting, Wan Yun, San Youhe. Chinese classification and diagnostic criteria for mental disorders 3rd edition autism diagnostic criteria for clinical research [J]. Chinese Journal of Psychiatry, 2002, 35 (3) : 162-165.
4. Zhou Xiaobing, Jing Jin. Growth behavior of pediatrics [M]. BeiJing: People's Medical Publishing House, 2005:331.
5. Hu Yamei, Jiang Zaifang. Zhu Futang Practice of pediatrics [M]. Version 7. BeiJing: People's Medical Publishing House, 2002, 1892-1893.
6. Han Zhenyang, Xing Jun. The diagnosis and treatment of mental retardation [J]. World Health Digest, 2011,8(9): 448-450.
7. Wang Jun, Wang Liwen. Clinical analysis and etiology study of 1329 cases of children with mental retardation [J]. Journal of clinical pediatrics, 2010,28 (5) : 450-454.
8. Wang Jun, Wang Liwen, The cause and diagnosis of mental retardation [J]. Chinese Journal of applied clinical pediatrics, 2008,2 (3) :230-233.
9. Gremse DA. Alternative approach to IBS and migraine is winning over providers[J], Dis Manag Advis, 2004, 10:6-10.
10. Fischer R, McGhee JR, VuHL, et al. Oral and nasal sensitization pro-mote distinct immune responses and lung reactivity in a mouse model of peanut allergy[J]. Am J Patho, 2005,167 (6) : 1621-1630.
11. Chen Yi, Chen Tongxin, Zhu Yazhong. The clinical significance Food allergen specific IgG detection [J]. Journal of Shanghai Jiaotong University, 2010,30 (2) : 143-146.

10/24/2014