



V. N. Karazin Kharkiv National
University
Shupyk National Medical Academy of
Postgraduate Education
Ukraine



EFFECTS OF IODINE SUPPLEMENTATION ON PHYSICAL AND PSYCHOMOTOR DEVELOPMENT IN YOUNG CHILDREN AND THEIR NEUROLOGICAL STATUS

Mamenko Marina

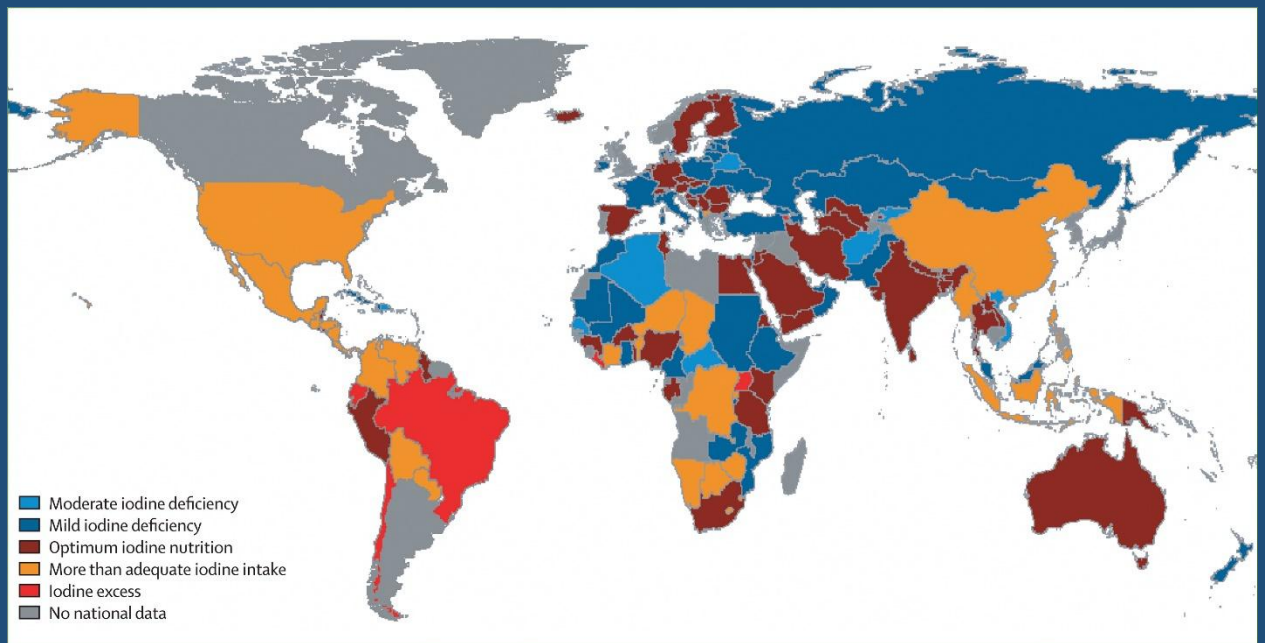
Professor, MD, PhD, Doctor of Medical Sciences
Dean of Pediatric Faculty

Shupyk National Medical Academy of Postgraduate Education

Shlieienkova Hanna

Assistant Professor, MD, PhD,
Department of Internal Medicine
V. N. Karazin Kharkiv National University

EAP-2017
Ljubljana, Slovenia



Actuality

- Iodine deficiency is the world's most prevalent, yet easily preventable, cause of brain damage.
- Iodine deficiency disorders (IDD), which can start before birth, jeopardize children's mental health and often their very survival.
- Iodine deficiency (ID) during pregnancy and infancy may impair growth and neurodevelopment, increase infant mortality. ID during childhood reduces somatic growth and cognitive and motor function.
- Greater significance is IDD's less visible, yet pervasive, mental impairment that reduces intellectual capacity at home, in school and at work.

Aim

To evaluate effects of iodine supplementation on physical and psychomotor development in young children and their neurological status

Methods

Target group: 118 children 0-3 years old from orphanage

Methods:

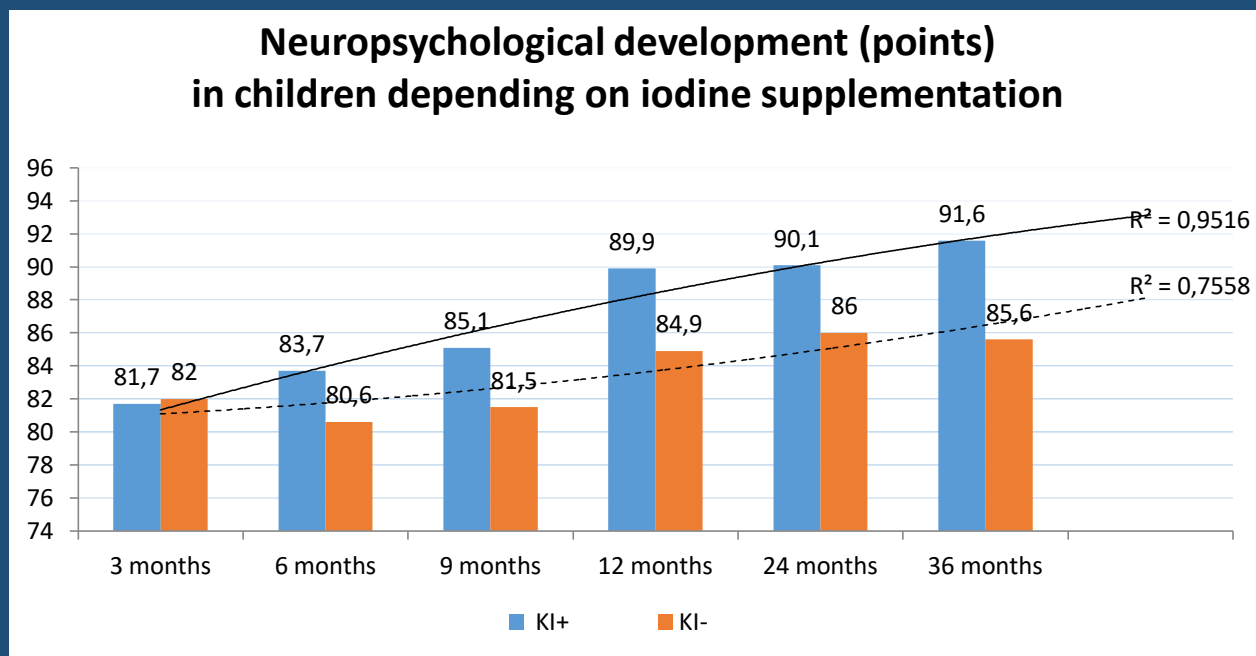
- Examination physical and neuropsychological development
- Dietary iodine intake evaluation by urinary iodine concentration (Sandell-Kolthoff reaction)
- Thyroid status by TSH, T4, T3 serum-based measuring (IMA)
- Iodine intake: infant formula (iodine concentration 100 µg/l) – 61 children (KI-) and additional iodine supplementation in 57 children (KI+) by drugs (50 µg per day for 6 months)

Results

Impact of iodine supplementation on thyroid status in young children

Labs		3 Months		6 Months		9 Months		12 Months	
		KI+ (n=57)	KI- (n=61)	KI+ (n=57)	KI- (n=61)	KI+ (n=57)	KI- (n=61)	KI+ (n=57)	KI- (n=61)
TSH mU/l	Me	3,21	3,24	2,23	2,89	1,98	2,98	1,96	2,99
	25%, 75%	2,31; 4,19	2,76; 3,98	1,87; 2,54	2,16; 3,78	1,78; 2,16	2,24; 3,78	1,77; 2,01	2,43; 3,98
	p	0,328		0,021		0,001		0,001	
T3 nmol/l	Me	3,8	3,9	3,5	3,7	3,5	3,6	3,4	3,6
	25%, 75%	3,3; 4,5	3,3; 4,6	3,2; 4,2	3,2; 4,3	2,8; 4,1	3,2; 4,2	2,9; 4,1	3,2; 4,2
	p	0,731		0,149		0,316		0,798	
T4 nmol/l	Me	146,2	148,3	151,5	148,5	156,0	152,0	162,0	156,0
	25%, 75%	141,4; 167,2	143,1; 168,7	142,5; 165,0	137,0; 166,5	148,0; 167,0	146,0; 168,0	146,0; 182,0	144,0; 172,0
	p	0,639		0,391		0,674		0,257	

- Iodine supplementation per 6 months reduced median TSH level up to 1.96 mU/l [QR: 1,77; 2,01] ($p < 0.001$) vs median TSH level in control group 2,99 mU/l [QR: 2,43; 3,98], $p < 0.001$
- That resulted in improvement of anthropometry indicators (92.3 %, $p < 0.001$) and psychomotor development (50 %, $p < 0.001$)
- The coefficient of neuropsychological development increased (up to 92 points)



- The frequency of neurological signs reduced up to 28.9 % ($p < 0.001$)

Conclusions

- Iodine supplementation is an effective mean of correcting physical, neuropsychological development and improvement of neurological status in children with dysfunction of the nervous system

References:

1. Costeira, M.J. Psychomotor Development of Children from an Iodine-Deficient Region / M.J. Costeira, P. Oliveira, N.C. Santos [et al.] // J Pediatr. – 2011. – Vol. 159. P. 447-53.
2. Desai P. Thyroid Function in Children / M.P. Desai // Supplement To Jap. – 2011. – Vol. 59. – P. 35-59.
3. Delange F. Iodine deficiency as a cause of brain damage / F. Delange // Postgrad. Med. J. 2010. – Vol. 77. – P. 217–220.
4. Desai P. Thyroid Function in Children / M.P. Desai // Supplement To Jap. – 2011. – Vol. 59. – P. 35-59.
5. Ghassabian A. Maternal Thyroid Function During Pregnancy and Behavioral Problems in the Offspring: The Generation R Study / A. Ghassabian, J.J. Bongers-Schokking, J. Henrichs [et al.] // Pediatr Res. – 2011. – Vol. 69. – P. 454–459.
6. Lazarus J.H. Antenatal Thyroid Screening and Childhood Cognitive Function / J.H. Lazarus, J.P. Bestwick, S. Channon [et al.] // N Engl J Med. – 2012. – Vol. 366 (6). – P. 493-501.
7. Murcia M. Effect of Iodine Supplementation During Pregnancy on Infant Neurodevelopment at 1 Year of Age / M. Murcia, M. Rebagliato, C. In˜iguez [et al.] // Am J Epidemiol. – 2011. – Vol. 173(7). – P. 804–812.
8. Zimmermann M.B. Iodine deficiency and excess in children: worldwide status in 2013 / M.B. Zimmermann // Endocrine practice. – 2013. – Vol. 19, № 5. – P. 839-46.

Presenting author:

Hanna Shlieienkova

Assistant Professor, MD, PhD,
Department of Internal Medicine

V. N. Karazin Kharkiv Nacional University
Kharkiv, Ukraine

E-mail: shleen07@gmail.com