

TRAITS AND PERSPECTIVES OF COMPREHENSIVE DIAGNOSTICS OF MENTAL HEALTH OF YOUNG CHILDREN WITH INTRAVENTRICULAR HEMORRHAGES AND POSTHEMORRHAGIC HYDROCEPHALUS IN ANAMNESIS

Nataliia Andrushchenko^{1,2}, Evgenij Kryukov¹, Rifkat Muhamedrahimov², Aleksander Iova¹, Irina Arintsina², Varvara Anikina², Oksana Poteshkina¹, Maryia Solodunova², Irina Mamajchuk², Daryia Chernego²

¹ I. I. Mechnikov North-Western State Medical University, Saint-Petersburg, Russia

² Saint Petersburg State University, Saint-Petersburg, Russia

Background

Hydrocephalus is one of the most frequent neurological and neurosurgical problems in children and has a negative impact on the future mental development of children. However, there is a clear lack of clinical-psychological research of mental development of children with hydrocephalus. The problem of hydrocephaly is evident since this pathology is quite widely spread (5–10 cases per 1000 newborns) and has great influence on neonatal deaths and disability [1, 2, 3, 4]. For the preterm infants with intraventricular hemorrhages the progressing posthemorrhagic hydrocephalus develops in almost half of the cases, but in general population the progressing posthemorrhagic hydrocephalus develops in 1 per 500 children [5].

Purpose

The purpose of our research is to study neuropsychological and intellectual characteristics of preschool children with occlusive hydrocephaly or hydrocephalus syndrome in anamnesis.

Materials and Methods

The level of the intellectual development and qualitative characteristics of cognitive functions' development were measured using a G. French PTI (adapted by N. A. Shumskaya); neuropsychological characteristics were studied with the use of battery of six neuropsychological tests (by Luria). Data analysis was done by the analysis of variance. We have studied 45 children, among them 23 children with occlusive hydrocephaly in anamnesis and brain shunting, and 22 children whose dilatation of brain was noted in infancy. In order to compare the data we have studied 23 normally developing children as well.

Results

Children with hydrocephaly in anamnesis and neurosurgical operation, had developmental delays in intellectual abilities related to wrong conclusions (subtest of perceptivity), difficulties in concentration of attention (subtest of similarity). Children with occlusive hydrocephaly in anamnesis, showed no difficulties in acoustic gnosis and speech, but obviously expressed developmental delay in praxis.

Conclusions

The identified clinical and psychological characteristics of children with hydrocephalus require a differentiated approach to determining the prognosis of their development, and prevention of mental disorders. Children with hydrocephaly (hypertensive-hydrocephalic syndrome) seem to have a favorable prognosis for their mental development. We see that the main areas of work should be aimed at the prevention of neurodynamic disorders, involve development of self-regulation behavior, motivation and voluntary attention. For children who have been operated for hydrocephaly the main focus of work should be on the development of visual-spatial analysis and synthesis, early stimulation of speech development while a child is manipulating with objects.

For the future studies it would be important to investigate mental development of premature babies with hydrocephaly in infancy in connection to the characteristics of the emotional states of their mothers, the characteristics of their early interaction and the socio-demographic characteristics of the family.

Acknowledgements

This work is supported by Russian Science Foundation under grant 18-013-01183 (Научно-исследовательская работа выполняется при поддержке гранта Российского фонда научных исследований (№ 18-013-01183) на тему «Комплексное изучение особенностей психического развития недоношенных детей младенческого возраста с внутрижелудочковыми кровоизлияниями и постгеморрагической гидроцефалией»).

References

1. Levene, M. J. (1999). *Textbook of Neonatology*. Edinburgh; London; New York e. a., P. 102–104; 106–107.
2. Greenberg, M. S. (2010). *Handbook of neurosurgery*. New York: Thieme.
3. Крюков, Е. Ю., Иова, А. С., Андрущенко, Н. В., Крюкова, И. А., Усенко, И. Н. (2017). Персонализация лечения постгеморрагической гидроцефалии у новорожденных. Нейрохирургия и неврология детского возраста. 53(3): 58–62. [Kryukov, E., Iova, A., Andrushchenko, N., Kryukova, I., Usenko, I. (2017). Personalization of posthemorrhagic hydrocephalus treatment in newborns. *Neirokhirurgiya i nevrologiya detskogo vozrasta*. 53(3): 58–62. (In Russ.)]
4. Volpe, J. J. (2009). Brain injury in the premature infant – a complex amalgam of destructive and developmental disturbances. *Lancet neurol*. 8(1): 110–124. [https://doi.org/10.1016/S1474-4422\(08\)70294-1](https://doi.org/10.1016/S1474-4422(08)70294-1).
5. Крюков, Е. Ю., Гармашов, Ю. А., Сотников, С. А., Иова, А. С., Козырев, Д. А. (2014). 15-летний опыт применения вентрикулосубгалеального дренирования недоношенных новорожденных с внутрижелудочковым кровоизлиянием. Нейрохирургия и неврология детского возраста. 40(2): 10–21. [Kryukov, E., Garmashov, Y., Sotnikov, S., Iova, A., Kozyrev, D. (2014). 15-years experience of using of ventriculosubgaleal drainage in preterm infants with intraventricular hemorrhage. *Neirokhirurgiya i nevrologiya detskogo vozrasta*. 40(2): 10–21. (In Russ.)]