



P-0503

Association between lead in umbilical cord blood and neurodevelopment at 6 months of age - PIPA Project / Rio de Janeiro / Brazil.

Mônica Seefelder de Assis Araujo, Ana Paula Natividade, Nataly Damasceno, Renata Lino, Carmen Ildes Rodrigues Froes Asmus.

Background

Environmental exposure to heavy metals in urban areas has been associated with adverse effects on child health. To investigate the effects of environmental pollutants on maternal-child health and to test viability for a birth cohort study, a pilot study (PIPA pilot study) was conducted from October 2017 to August 2018, at the Maternity School of the Federal University of Rio de Janeiro, Brazil.

This study aims to evaluate the association between lead concentration in umbilical cord blood and neurodevelopment at 6 months of age.

Methods

Lead concentrations in umbilical cord blood were measured by inductively coupled plasma mass spectrometry (ICP-MS).

Infant's neurodevelopment was evaluated using Denver Developmental Screening Test II (DDST-II) at six months old (n=41).

Concentration of lead in umbilical cord blood was divided into tertiles, the first tertile being the reference value

The association between the proportion of failures identified in the DDST-II at the sixth month of age and the concentration of lead in umbilical cord blood was analyzed.

Result



At one month old (n=54) and three months old (n=54), the failure performed respectively 18.5 % and 24.1 %. The proportion of failures in DDST-II was 31.7% at six months of age

Association between failures and the concentration of lead in umbilical cord blood.					
Tertiles	Lead * (µg/dL)	Fails (n)	RR	p	IC (95%)
1 ^o	3.12	7	1	-	-
2 ^o	4.39	3	0.593	0.595	0.188 - 1.872
3 ^o	15.74	2	0.735	0.999	0.199 - 2.714

* Geometric mean

Conclusion

There was an increase in the proportion of failures according to the age at which the assessment was made. The RR was higher in the 3^o tertile than in 2^o tertile although not statistically significant. The small number of evaluated newborns can justify these results. More follow-up studies with a higher number of children are needed to better assess the relationship between lead levels and neurodevelopment.

References

- Asmus CIRF, et al. Rio Birth Cohort Study on Environmental Exposure and Childhood Development – PIPA Project. *Annals of Global Health*. 2020; 86(1): X, 1–10.
- de Assis Araujo MS, et al. Maternal-child exposure to metals during pregnancy in Rio de Janeiro city, Brazil: The Rio Birth Cohort Study of Environmental Exposure and Childhood Development (PIPA project). *Environmental Research*. 2020 Apr 1;183:109155.
- de Figueiredo N, et al. Metal mixtures in pregnant women and umbilical cord blood at urban populations—Rio de Janeiro, Brazil. *Environmental Science and Pollution Research*. 2020 Jul 13:1-9.

Contact

- monica.seefelder@nutricao.ufrj.br
- <http://pipaufrij.me.ufrj.br/>