Role of vitamin e in neural tube of mouse (Mus musculus) embryos and fetuses treated with valproic acid: Immunohistochemical study of sonic hedgehog [Rol de la vitamina e en el tubo neural de embriones y fetos de ratón (Mus musculus) tratados con ácido valproico: Estudio inmunohistoquímico de sonic hedgehog]

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Sonic hedgehog (SHH) is an essential morphogen for the development of neural tube, members and somites. Variations in expression can cause abnormalities in the nervous system. This will produce teratogens, such as valproic acid (VPA), which increases the reactive oxygen species and can be counteracted with the administration of vitamin E (VE). We sought to determine the expression of SHH in the neural tube and spinal cord in mice embryos and fetuses exposed to VPA, VPA + VE and VE. For the study we used 8 groups of female mice (Mus musculus). At day 8 post-coitus (p.c.) the groups were administered as follows: groups 1 and 5, 0.3ml saline; groups 2 and 6, VPA 600 mg/kg; groups 3 and 7, VPA 600 mg / kg + VE 200 IU/kg; groups 4 and 8, VE 200 IU/kg, all treatments were given orally. On the 12th day p.c., groups 1, 2, 3 and 4 were euthanized and the remaining groups at day 17. They were fixed in Bouin solution and included in paraplast; thoracic cross sections were performed, anti-SHH polyclonal antibody (Santa Cruz, H-160, rabbit) dilution 1:100 was used. We described morphology of the positively labeled samples and measured integrated optic density and percentage of immunoreactive area. SHH expression was immunopositive in notochord and floor plate of the neural tube in embryos only 12 day p.c. In the groups treated with VPA + VE and VE immunohistochemistry showed greater intensity and percentage of immunoreactive area compared to those in the group treated with VPA (p?0.0001) in the floor plate, being similar to the control group. In the notochord, immunoreaction intensity was

similar to that shown in the floor plate, with significant differences (p ?0.0001), but the percentage of area showed no differences. The groups at day 17 of gestation were negative for the expression of SHH. VE regulates expression of SHH in neural tube, thus attenuating the effects of VPA.

Morphogen

Neural tube

Sonic hedgehog

Valproic acid

Vitamin E