Molecular diagno stic studies on the mutagenicity of an antiepileptic drug in mice embryo

Shimaa Mustafa Ibrahem El Aksere

The epileptic pregnant woman taking phenytoin (PHT) has a two to three times greater risk of delivering a child with congenital defects that includes craniofacial and limb abnormalities, cleft lip, impaired growth, and congenital heart defects. Physiologic changes occur during pregnancy that can alter the effective dose of medications a woman is taking. Some changes occur abruptly, while others evolve slowly. Most begin during the first trimester and peak during the second trimester of pregnancy. It may be necessary to adjust the dose and frequency of medication use repeatedly during pregnancy.The antiepileptics drugs have been recently, used for the treatment of hospital patients suffering from epilepsy, dermatology, ulcers, epidermolysis bullosa and inflammatory conditions. Accordingly, the present study deals with one of this group, PHT, which has been administered intraperitoneally to experimental albino mice, Mus muscculus, which provided from Theodor Bilharz research institute; El Nile road, Warrak El Hadar, Embaba, Egypt. The used mice in the present work were arranged in four different groups:-G1- Served as the normal males and females, where they put under the same laboratory conditions of temperature, light and feeding as the treated ones. They were injected with the same quantities of the drug solvent (saline solution) following the same route and duration of administration used in the treated groups.G2- Experimental males were treated daily with the applied dose of PHT (8 mg/kg) for 15 days Intraperitoneally, at the end of treatment period; these males were allowed to mate with normal females.G3- Experimental females (before mating) were treated daily with PHT (8 mg/kg) for 15 days, and then they were allowed to mate with normal males. Injection for these females were Intraperitoneally and continued at the 21th day of gestation (gestation period).G4- Experimental males and females were treated daily with PHT (8 mg/kg) for 15 days, and then they were allowed to mate with each other. Females were injected Intraperitoneally continuously, at the 21th day of gestation.At delivary, early newborn were collected and preserved in deep freezer. Polymerase chain reaction- restriction fragments length polymorphism (PCR-RFLP) techniques were carried out for the parentally treated early postnatal viability to determine the teratological effects of PHT on cytochrome b (CYT b) gene.In the present investigation, the molecular techniques investigate the effect of the drug on CYT b gene by PCR, RFLPs, PCR-RFLP techniques. The restriction fragments length polymorphism (RFLP) enabled specific identification and genetic differentiation between the four different studied groups.The polymerase chain reaction (PCR) is

used to amplify and analysis specific fragments of a DNA strand genes. The selected CYT b gene of each group has been amplified using PCR technique. RFLP profiles of genes were obtained by digestion with twelve restriction enzymes (ApoI, BseRI, PstI, MaeIII, AfaI, SpeI, EcoRI, DraI, AseI, BanI, HindIII).The obtained results confirmed that the PHT has mutagenic effect on the gene ”CYT b” of the early postnatal newborn.