

Teratogenic effects of metronidazole on mice fetus using FTIR spectroscopy

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Background and Aims: Metronidazole is used to treat trichomoniasis, bacterial vaginosis, and other diseases. There are controversy aspects about its teratogenicity. As far as we know, a teratogenic agent can alter morphology or subsequent function. That's why we have investigated the teratogenic effects of this drug during the mice fetus brain and liver growth.

Methods: The mice were injected metronidazole (60mg/kg on gestation day 9). Fetuses were dissected on day 15 of gestation and morphological and histological studies on the fetus's brain were carried out. Serial cryo-sectioning (10 μ m) of normal and metronidazole-treated brains and livers were used for FTIR measurement in the wave number region of 4000- 400-1 cm. The results were shown by 2nd derivatives and subtractions.

Results: The results showed that there were some variations between the fetus of normal and treated brain and liver. The band intensities in fetus brain and liver of test animals were reduced and shifted at 709 cm⁻¹, 1636 cm⁻¹, 1453 cm⁻¹, 1529 cm⁻¹, while the band intensities were increased and shifted at 1360 cm⁻¹, 1256 cm⁻¹ and 1223 cm⁻¹, 1723 cm⁻¹, 879 cm⁻¹ and 810 cm⁻¹. Also, the band intensities in fetus brain and liver of test animals were reduced and shifted at 707 cm⁻¹, 1155 cm⁻¹, 1054 cm⁻¹, 2944 cm⁻¹, 1256 cm⁻¹ and 1219 cm⁻¹, 1453 cm⁻¹ and 1525 cm⁻¹, 1622 cm⁻¹ and 1645 cm⁻¹.

Conclusions: It was concluded that the most of variations in brain and liver of Metronidazole treated fetuses are in amid bands, nucleic acid and carbohydrate bands. Our results indicate that FTIR spectroscopy can be a useful tool for biodiagnostic.

Keywords: Metronidazole; FTIR; Brain; Liver; Teratogenicity; Fetus