ELUCIDATION OF THE MECHANISMS OF TERATOGENICITY OF SOME COMMONLY USED MEDICINAL PLANTS

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ABSTRACT

An array of studies has proven the efficacy of numerous medicinal plants against ailments ranging from pain to microbial infection. However, their teratogenic potentials have not been well elucidated. One such ethnobotanical survey was used to determine the types of medicinal plants used by pregnant women in Lagos, Nigeria. The aim of this study is to determine the possible teratogenic effects on the cardiovascular and nervous systems and the mechanism of teratogenicity of these commonly used medicinal plants.

The aqueous extracts of some of the most commonly used plants (Enantia chlorantha, Morinda lucida and Moringa oleifera) were prepared. Pregnant Wistar rats were treated with several doses (150-600 mg/kg) of these extracts at gestational day six and the litters were examined for any defects at gestational day 20. There was no significant change in the number of litters and their gross morphology. However, there was a significant increase in fetal resorptions, and the overall body size and crown to rump length of the litters was affected in a dose dependent manner of which the direction is dependent on the plant species. Zebrafish embryos were also exposed to several concentrations [0.1-2.8 mg/ml] of the extracts between 4-144 hours post- fertilization. A dose dependent effect on the developmental processes of the zebrafish embryo, was noted leading to lethal lethality, skeletal dysmorphogenesis and pericardial edema leading to the formation of a tubular heart. However, there was no significant change in locomotor activity of the death embryos at 6 days post-fertilization when there was no overt teratogenicity.

These research findings offer a basis for further investigation of the cellular and molecular mechanisms by which these extracts cause developmental defects in both zebrafish and rat embryo culture. These approaches remove the influence of maternal metabolism and other influences, and will provide valuable endpoints for exploration in pregnant mammals and humans.

INTRODUCTION

Herbal medicine use had been on the increase for the management of various ailments, the World Health Organization (2007) estimates that about 67%-80% of the world population uses traditional medicine as their primary form of health care. This has been primarily influenced by patients disapproval with conventional medicine safety and therapeutic outcomes (Ernst et al., 2000). In addition, there is the common assumption that natural is better, hence, herbal medicines may seem to be an attractive natural alternative for women who want to avoid taking drugs during pregnancy. Indeed, herbal medicines have produced therapeutic advantages ranging from their use as antibiotics, antigenic agents, anti-inflammatory agents and chemotherapeutic agents among other uses of herbal medicinal plants. However, despite these advantages, like any other substance, traditional medicines have the potential to be toxic. Although there have been some research carried out on the toxicity profile of some herbal plants, there has been little to no work done on the teratogenic effects of medicinal plants.

METHODOLGY

RESULTS

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<th>Control</th>
<th>0.500mg/ml</th>
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Conclusions

Zebrafish embryos treated with Enantia Chlorantha showed early life developmental delay at the highest dose (1.28mg/ml) tested which was not used in further study. Exposure of transgenic zebrafish to Enantia Chlorantha produced an effect on cardiovascular function, as indicated by the relative velocity of erythrocytes. There was a developmental delay at 24hpf at the highest dose and pericardial defects (PE) in each litter was observed at 48hpf. Early life stage toxicity screening was performed on Enantia Chlorantha following treatment with Enantia Chlorantha. A P<0.001 of the effect of the vehicle was observed in the experiments. The intersegmental vessels of the trunk are among the first angiogenic vessels to form in all vertebrates thus making it one of the important structures in the investigation of angiogenesis. Mag whole fish: X 100; intersegmental vessels X 200

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References