

TRADITIONAL MEDICINES AND THEIR POTENTIAL TERATOGENIC EFFECTS

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Traditional medicines are very popular in all parts of the world. These medicines are mostly derived from nature, including herbs, animal and mineral products. These medicines are widely used to maintain good health and to prevent or treat various diseases including treating early pregnancy symptoms such as nausea and vomiting (Wesfall, 2004), to induction of abortion, treatment of threatened abortion (Tang et al., 2012) or labor (Kamatenesi-Mugisha and Oryem-Origa, 2007). Several plants are used as traditional medical therapies, *Cissampelos mucronata* A being one of them.

Cissampelos mucronata A. Rich (Menispermaceae) is found in tropical and subtropical areas of Africa, America and Asia (Muthaura et al., 2007; Nondo et al., 2011). Extracts from *C. mucronata* are used for various reasons such as treatment of malaria (Gessler et al., 1994; Tshibangu et al., 2002) or wounds (Nondo et al., 2011). In the Anatomy Journal of Africa, Garba et al.2014, have described embryofetal effects of the methanolic root extract of *Cissampelos mucronata* (*C. mucronata*) in rats. This animal study examined in a dose response manner the impact of administration of *C. mucronata* extract on the number of implantation sites, fetal weight and crown rump length of rats. Though confounding was not controlled for, Garba et al., study does show dose dependent resorption of implantation sites and fetalpathy in rats. Garba et al., 2014 findings are similar to those of Tang et al 2012, who using whole embryo cultures confirmed the embryotoxic effects of Large head *Atractylodes Rhizome* (LAR), a Chinese herb used to treat threatened abortion on the developing mouse embryos. Increased dose of LAR resulted in exencephaly, underdeveloped or absence of forelimb and hind limb buds, viscera bareness and severe growth retardation in the embryos (Tang et al., 2012).

Study by Nondo et al., 2011 showed that extracts from aerial parts of *C. mucronata* exhibited antibacterial activity against several bacteria and antifungal activity against *Candida albicans* and *Cryptococcus neoformans*. These aerial extracts exhibited very low toxicity to brine shrimps and had no larvicidal activity. The root extracts exhibited good larvicidal activity but weak antimicrobial activity. The root dichloromethane extracts from *C. mucronata* was found to be more toxic with an LC50 value of 59.608 µg/mL while ethanolic extracts from root were not toxic with LC50>100 µg/mL). Ethanol extracts from fruits and roots of *T. villosa* were found to be very toxic with LC50 values of 9.690 µg/mL and 4.511 µg/mL, respectively, while, ethanol extracts from leaves and twigs of *T. villosa* were found to be non toxic (LC50>100 µg/mL) (Nondo et al., 2011).

Phytochemical tests of a five plant polyherbal extract: *Rhynchosia recinosa* (A.Rich.), *Ozoroa insignis* (*O. insignis*), *Maytenus senegalensis* (*M. senegalensis*), *Entada abyssinica* (*E. abyssinica*) and *Lannea schimperi* (*L. schimperi*) used to treat peptic ulcers in Tanzania showed that the combined extract contained tannins, saponins, steroids, cardiac glycosides, flavonoids and terpenoids (Haule et al., 2012). Notable in that study was the finding that steroids and terpenoids were present in all the five plant extracts and the mixed extract of the five plants. Alkaloids were only detected in the *O. insignis* extract but not the other four plants or the mixture. Flavonoids were present in *L. schimperi*, *O. insignis*, *E. abyssinica* extracts and the mixed extract of the five plants (Haule et al., 2012).

The studies by Garba et al., 2014, Haule et al., 2012 and Nondo et al., 2011 shows different parts of herbs or different plants have different chemical composition while depending on the method of extraction, different chemicals may be extracted. Thus, herbal toxicity may depend

on the part of the plant used or the active ingredient in pharmaceutical preparations. As observed in the study by Nondo et al., 2011, extracts from roots of *T. villosa* were very toxic as compared to extracts from leaves and twigs of the same plant using same extraction method.

Study by Fakeye et al., 2009 in Nigeria found that more than two-third of respondents (67.5%) had used herbal medicines in crude forms or as pharmaceutical pre-packaged dosage forms, with 74.3% preferring self-prepared formulations. In that study, almost 30% who were using herbal medicine at the time of the study believed that the use of herbal medicines during pregnancy was safe. Herbal medications were considered to have better efficacy than conventional medicines, or because herbs being natural were safer to use during pregnancy than conventional medicines, easy access, traditional and cultural belief in herbal medicines to cure many illness, and comparatively low cost of herbal medicines were other reasons for use (Fakeye et al., 2009, Forster et al., 2006, Holst et al., 2009).

The prevalence of herbal medicine use during pregnancy is between 7% and 58% (Holst et al., 2009, Tiran 2003). About half of all pregnancies are unplanned and women of childbearing age may be taking herbal medicines as general treatment during early pregnancy or for early pregnancy symptoms (Nordeng and Havnen 2004, Westfall 2004). They may be taking these herbs to regulate periods or to help with menstrual cramping or treatment of threatened abortion (Tang et al., 2012). Coupled with traditional and cultural beliefs, there are many opportunities to use herbal medicines during pregnancy. More important is the fact that they are likely to be used during the window period when the growing fetus is most sensitive to teratogens, week 3-8 (Sadler 2000). This is a period when the woman does not know she is pregnant. By the time the pregnancy is confirmed, she is within the teratogenic window or has already passed through the time when there is the most risk of major malformations. There is need for more research to understand the potential dangers of herbal medicines in women of childbearing age, particularly when it is known that they are trying to conceive or on treatment for threatened abortion.

In summary, there is some evidence of harm of traditional herbal medicines as presented by Garba et al., 2014 and supported by literature either used singly or as polyherbal. However, studies on embryo-toxicity or fetopathy in human are still scanty. A systemic review and meta-analysis of adverse outcomes of Chinese medicines used for threatened miscarriage (Li et al., 2011) concluded that the available studies varied considerably in design, interventions and outcome measures making it difficult to have a definitive conclusion on safety and efficacy. More studies, in particular placebo randomized clinical trials are need to assess the safety or toxicity of herbal medicines given their widespread use.

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