
Preamble

Metanil yellow (monosodium salt of 3[[4-(phenylamino) phenyl] azo] benzenesulfonic acid) is a synthetic dye and is specially used in leather, textiles and paper industries as a coloring agent. It is very cheap and easily available in the market. Presently, metanil yellow is used to color some food products as substitute of organic dye permitted as non toxic food additive of some food products like laddoo, jalebi, amriti and to color basan, turmeric powder and other spices. Since its inception in the food industries as food additive, the toxicity of metanil yellow on some organ system functions have been reported in animal models. The effect of metanil yellow in male infertility has been reported. The aim of the present study was to examine the probable toxic effects of metanil yellow on female reproductive system in rat model to let us know the effect of metanil yellow contaminated foods on human health.

At the outset, the percentage amount of metanil yellow contamination in some food items prepared by organized and unorganized sectors in 6 districts in West Bengal state of India have been determined. I found majority of the food samples collected from unorganized sectors contain metanil yellow at levels above the maximum permissible limit as stated in the charter of Prevention of Food Adulteration Act of India (PFA, 2008). Subsequently, the effects of metanil yellow on the estrous cycle rhythmicity in female rats and on the functions of ovary and uterus have been examined to elucidate the effects of metanil yellow on the female reproductive system functions. I found distinct functional alterations in estrous cycle rhythmicity in metanil yellow exposed female rats. Besides, the molecular structural degenerations of the uterus and ovary in metanil yellow exposed rats have been observed due to promotion of oxidative stress. The levels of female reproductive hormones have also been decreased significantly in metanil yellow exposed rats. Metanil yellow also produced inhibition of folliculogenesis and thus impairment of the production of ovum in female rats; and inhibited the contraction of uterine smooth muscles by changing the mode of activation of autonomic and non adrenergic non cholinergic (NANC) efferents.

The results of our study will, probably, play the important role in establishing the fact that metanil yellow is a potent human toxicant and possibly causes depression of female reproductive system functions. Moreover, the results can be considered as a scientific basis to ban the indiscriminate use of metanil yellow in food industries as a food additive by the state and federal Governments adhering the Prevention of Food Adulteration Act of India, 1954 (Amended in 2008).