

## Response 2

Sir,

Glutathione is required to defend ionizing radiation. It helps to restore the immune capability of the body and this can be retained easily with the help of six postures (stretching, bending and twisting postures) of yogasana. The defensive mechanism of the body can be developed by pranayama too. The science of breathing (mainly pranayama) along with slow and deep breathing of about fifteen or less cycle per minute is quite advisable to improve the antioxidant status of the individual. Yoga suggests improving the antioxidant by reducing the breathing rate about ten or lower cycling per minute in alpha phase to improve the antioxidant status.

Oxidative stress is caused by exposure of radiation (beyond normal range) for prolonged time. This is because white blood cells are destroyed due to excessive flow of energy in pingla path. This, in turn, makes catabolic function to predominate. Anuloma-Viloma pranayam is the best solution to harmonize Ida and Pingla path. It could reduce

the presence of free radicals, prone to form oxidative stress.

There is not sufficient data available where yogic practices were given to people after radioactive exposure or release. However, many yoga therapy practices have been carried out and positive results have been reported, especially in case of post radiation effect on chemotherapy. Papers related to yogic application on chemotherapy have been published by S-VYASA in national and international journals. There are many books like (1) Pranic energisation technique (PET) and, (2) Mind sound resonance technique (MSRT) both written by Dr. H.R. Nagendra, Vice chancellor of S-VYASA, Bengaluru, which should be referred by the authors to analyze the benefits of advanced yogic practices for the cure or minimization of blood leukemia and bone marrow problems related to radiation effects. Yoga provides protective effect on WBC by maintaining or increasing its count in the blood. It is also shown that Yoga practice reduced post radiation exposure DNA damage, which means reduction of oxidative stress. DNA damage

happens during radiation exposure, as catabolic function is irregular compared to anabolic function. If anabolic and catabolic functions are normal, meaning generations and destruction of body cells are equal, then the oxidative stress is minimum. Yogic practice like energization technique, pranayama, relaxation and meditation will enhance the generation of Pancha pranas and their relations with Panch Koshas. This will take care of the damaging factors caused by radiation exposure. Authors may be advised to refer to the above-mentioned books for better explanation of yoga as a protective lifestyle in the present post nuclear leakage crisis.

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