EDITORIAL

Protein and Liver Function Changes Following Body Irradiation: 'A Research Needs' for Further Exploration in Present Day Man-made Environmental Changes

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The liver is involved in coordination of the metabolism of carbohydrates, proteins, lipids, vitamins and hormones. In addition, it is fully involved in storage, detoxification, production of enzymes and bile as well as a reticulo-endothelial defence mechanism. It can serve as a glass window that peeps into the occurrences in the micro-environment of the body. Any injury in the body is expected to have telltale signs in the liver protein metabolism from injured cells. This suggests the importance of liver response to injury as an effective marker of irradiation injury in the body. The use of liver enzymes and blood haematocrit level and plasma protein ratio has been found to be a good indicator in assessing liver insults, however, further research effort needs to be undertaken to find better markers that can show signs earlier (1).

Total body irradiation has taken on a global importance, following the changing natural environment due to man-made interventions and practices, yet it is a choice therapy for the management of some malignancies (2). Ionizing radiations and X-rays significantly impact on body systems of animals and humans (3, 4), and can come from a wide variety of sources.

- The climatic pattern worldwide has shown drastic changes attributed to depletion of the ozone layer, considered to protect from the harmful effect of ultraviolet radiation emission from the sun. This has been noted to be caused by global warming with its attendant effect on daily existence (5). Irradiation emissions can also be obtained from the natural environment as shown by Henri Becquerel in 1896, when he discovered evidence of radioactive emission from natural rocky uranium (6).
- The works of Conrad Roentgen [1895] (7) on X-ray and the Curie family [after 1996] (6) on artificial radioactive material led to the findings of the following radiation emissions: X-ray, gamma rays, beta rays, alpha rays, neutron and positron emissions. These rays have found great use in healthcare management like: 'evidence based diagnosis, interventional procedures and treatment'. In addition, there is increasing use of heat, sound and magnetic resonance in medical diagnosis and treatment (2).
- There is worldwide insecurity from wars, crime and terrorism. This has led to increased use of surveillance gadgets and the use of long distance communication gadgets with their attendant radiation emission. In addition, there is increasing use of nuclear reactors, heavy duty machinery in industries and threat of atomic and nuclear warheads (6). These are very serious global factors that may lead to increased threat of irradiation injuries.

The biological harmful effects of irradiation are well established facts and they are divided into somatic and genetic injury. The somatic injuries are further divided into acute and chronic injuries which are obtained from non-stochastic and stochastic mechanisms. Stochastic mechanism refers to irradiation injury in which the probability of occurrence increases with increased absorbed dose and is not dependent on the magnitude of absorbed dose, which is a kind of an all-or-none phenomenon. The example is uncontrolled cancer formation. Non-stochastic mechanism is irradiation injury in which there is increased severity with increasing absorbed dose, causing dystrophic or degeneration tissue injuries like lens opacification (7).

From the aforementioned, irradiation injuries can cause cell destruction or stimulation of cell division or both. Diagnosis is important in assessing the state of health of the organism and of much importance in assessing the degree and state of damage to tissues with increasing exposures to radiation. Studies have shown that there are changes in liver mRNA levels and hepatocyte growth factor (8, 9) with total body irradiation. In this issue of the Journal, Nwokocha *et al* (2) show that liver function (using liver function enzymes) is compromised over the course of their study following increasing episodes and doses of total body irradiation.

It is important that more research effort be geared toward determining a benchmark from possible liver res-

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ponse in the form of chemical, enzyme and other changes that can show early tell-tale signs of the impending doom. This can help institute early intervention to prevent the consequences. It could mean removal of such subjects from the source of irradiation insult.

In conclusion, research geared toward these areas is of great merit to the present day world.

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