

The Biochemical Effects of Microwave Radiation on the Skin of Wistar Rats (AWR)

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Abstract

This research work investigated the effect of Microwave (MW) radiation on the skin and some biochemical parameters using Albino Wistar Rat (AWR). 14 wistar rats of about 16-18weeks old weighing between 170-230g were used for this study. Two of the wistar rats were used for preliminary test to check that animals were healthy and for proper understanding of parameters after which they were randomly divided into two groups of six each; group C (controlled) and group E (exposed). Group E were fed with microwaved food and water microwaved for 10minutes in the microwave oven while group C were fed with non-microwaved food and water for 60days terminated into four session at 20days interval; 1st, 20th, 40th, and 60th day after which the blood samples and skin were taken to National Veterinary Research Institute (NVRI), for proper analysis. The results of the biochemical tests showed an increased in AlkalinePhosphatase (ALP), Aspartate Amino Transferase (AST), Alanine Amino Transferase (ALT) in the exposed group compared to the controlled group with time and increased ingestion of microwaved food. Increase in serum ALP activity observed in the exposed group indicates hepatocellular injury, liver cancer, gallstones or blockage in bile duct. Increase ALT levels are most commonly associated to viral hepatitis, ischemic hepatitis or liver injury. Increase AST level indicates liver damage if associated with ALT and ALP elevation. The skin of the rats exposed to MW radiation showed increase thickening in the stratum corneum and proliferation of hair follicles which indicates hyperkeratosis of the skin. The value of SAR calculated (0.03mW/Kg) for the skin was observed to be much less than the standard value of 0.08W/Kg and much less than the recommended level of exposure to MW radiation (2W/Kg). The results from this research indicates that exposure to MW radiation affects skin and biochemical parameters (AST, ALP, ALT) even at calculated SAR and with long exposure may lead to health hazards.

Key words: Microwave radiation (MW), non-ionizing radiation, skin, Aspartate Amino Transferase (AST), Alanine Amino Transferase (ALT), Alkaline Phosphatase (ALP).