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RES Nº133

STUDIES ON TOLERANCE TO D<sub>2</sub>O TO BE ADMINISTERED TO PROMOTE TISSUE PENETRATION OF THERMAL NEUTRONS IN BORON NEUTRON CAPTURE THERAPY (BNCT). Camillo, M.A.P.\*\*; Moritani \*\* and Hatanaka, H.\*\*. \*IPEN-CNEN/SAO PAULO - BRASIL \*\*TEIKYO UNIVERSITY AND HOSPITAL - JAPAN.

In BNCT, the patients whose tumor-beds had been exposed to more than  $2.5 \times 10^{12}$  n/cm<sup>2</sup> demonstrated a 5 years survival of 100%. If the tumor were situated within 6 cm from the cortical surface, the 5 year-survival was 0%. As these clinical result suggest, the greatest problem in conducting BNCT is the poor penetration of thermal neutrons (with an average energy of 0.025 eV). These thermal neutrons are attenuated mostly by hydrogen atoms in tissue of which the main component is water. This study was to assess the possible usefulness of D<sub>2</sub>O in facilitating the deep penetration of thermal neutrons in tissue.

The subacute effect in relation to the displacement rate was observed in rats. They were injected for 1, 2, 3 and 4 days with 20 ml of D<sub>2</sub>O Lactate Ringers Solution twice a day with 12 hours intervals into the tail veins. It was found that the animals did not show any clinically noticeable toxic effect at the displacement rate less than 30%. D<sub>2</sub>O displacement rate of body water of this rate will increase the penetration of thermal neutron in the brain matter by almost 20%. This will be a significant contribution to the treatment of deep-seated tumors.

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