Contribution ID: **128** Type: **poster preferred**

Dose assessment and consideration in the deep place of the skin at the time of liniment use

Tuesday, 16 October 2012 16:18 (1 minute)

Purpose: For patients who experience radiation dermatitis during radiotherapy, we sometimes use pharmaceutical agents applied topically, such as creams and lotions. Irradiation of treated parts thus sometimes occurs. If a substance exists in the skin surface, the skin dose might be slightly affected by such exposure, and the agent could become a factor associated with radiation injury. The present experiment was conducted to evaluate and reproduce a state where topical agents were applied and surveyed.
Methods: Measurements were made using dosimetry (parallel chamber). A MixDP (thickness, 50mm) was placed behind the dosimeter, and a MixDP (thickness, 2mm) was placed in front. Systemic contact dermatitis (SCD) was 100cm, the area of the radiation field was 10x10cm2. The radiation exposure comprised X-rays of 4MV and 6MV and electron beams of 9MeV and 12MeV. A wrap film placed on the 2mm-thick MixDP was considered as a control. Various medicines (Keratinamin Kowa ointment, RINDERON-VG lotion, RINDERON-VG ointment, Juvela ointment, two kinds of hand creams, and sunscreen (SPF30 PA++)) were applied to the wrap film and measured, and differences were analyzed. The agents applied had a concentration of about 0.5 g/10x10cm2.
Results: When a topical cream was applied, 4MV X-ray values were +0.27% to +1.09% higher than control values. We found the largest difference using RINDERON-VG lotion, which was 1.75% higher than controls. With 6MV X-rays, a difference of +0.33% to +1.82% was seen with topical creams. Just like 4MV X-rays, with RINDERON-VG lotion, the difference was slightly larger, at +2.16%. The 9MeV electron beam was -0.70% to +0.20 different than the controls, while the 12MeV electron beam showed differences between -0.02% and +0.29%.
Conclusion: With X-rays, significant differences arose between each energy level and each topical agent. RINDERON-VG lotion showed a larger difference than the other agents. With electron beams, no significant differences were seen. Dose differences were larger with lotions than with ointments. Given these findings, the factors affecting skin dose at a specific depth are considered to increase according to such factors as form or density. When an agent is used clinically, the dose increases several percent, and if the medicine does not require a specific method of use, major problems are unlikely to be encountered. However, if the medicine happens to become accumulated, observable influences appear likely to be produced.

Primary author: Mr AKIMA, Ryo (Department of Diagnostic Radiology & Radiation Oncology, Kochi Medical School)

Co-authors: Dr NISHIOKA, Akihito (Department of Diagnostic Radiology & Radiation Oncology, Kochi Medical School); Mr TSUZUKI, Akira (Kochi Medical School hospital); Mr YOKOTA, Norikazu (Kochi Medical School hospital); Ms TOKUHIRO, Shiho (Department of Diagnostic Radiology & Radiation Oncology, Kochi Medical School); Mr YAOGAWA, Shin (Kochi Medical School hospital); Dr KARIYA, Shinji (Department of Diagnostic Radiology & Radiation Oncology, Kochi Medical School); Mr SASAKI, Toshikazu (Kochi Medical School hospital); Prof. OGAWA, Yasuhiro (Department of Diagnostic Radiology & Radiation Oncology, Kochi Medical School); Dr KATAOKA, Yuko (Department of Diagnostic Radiology & Radiation Oncology, Kochi Medical School)

Presenter: Mr AKIMA, Ryo (Department of Diagnostic Radiology & Radiation Oncology, Kochi Medical School)

Session Classification: Poster Session 1

Track Classification: Biological and Physical Dosimetry