Nucleolar organizer regions in squamous cell carcinomas of the uterine cervix treated with chemoradiotherapy

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**Background:** Nucleolar organizer regions (NORs) are chromosomal loops of DNA involved in ribosomal synthesis. Their size and number in a nucleus has been reported to reflect the proliferative activities of various cells. The purpose of this study was to assess the meaning of the number of NORs in tumor-cell nucleoli compared with other proliferative markers before and after 10 Gy irradiation.

**Material and Method:** Forty six biopsy specimens from twenty three patients with cervical squamous cell carcinoma treated with chemoradiotherapy at Cipto Mangun Kusumo Hospital (Indonesia) taken before radiotherapy and after exposure to 10 Gy were analyzed. The number of NORs was measured using a silver staining method. MIB-1 and p53 labeling indexes (LI) were measured using an immunohistochemical method. Histological radiation response and mitotic index (MI) were investigated with hematoxylin and eosin staining.

**Result:** After 10 Gy irradiation, the number of NORs per nucleolus (AgNOR score) decreased from 4.9 to 3.4 (p<0.001). MIB-1-LI and MI increased from 26 to 39 (p<0.01) and from 0.006 to 0.012 (p<0.001), respectively. Before radiation therapy, a positive correlation was found between AgNOR score and MIB-1-LI (p=0.001) and between AgNOR score and MI (p=0.01). At 10 Gy, there was no significant correlation among number of NORs, MIB-1-LI, MI, or p53-LI. Histological radiation response had no correlation with AgNOR, MIB-1-LI, MI, or p53-LI.

**Conclusion:** The number of NORs can be used as proliferative marker for assessing tumor cell proliferative activity before chemoradiotherapy but not after 10 Gy irradiation.

Keywords: AgNOR, cervical squamous cell carcinoma, chemoradiotherapy, MIB-1,
Figure 1.
I present my research in PhD examination Gunma University Graduate School of Medicine, Maebashi Japan, on 1 September 2009

Figure 2.
Professor Takashi Nakano, MD, PhD (a) and Associate Professor Yoshiyuki Suzuki MD, PhD Speaking in Thank Giving Party after my PhD Examination, Maebashi, Japan on 1 September 2009