J Nucl Med Radiat Ther 2015, 6:4
http://dx.doi.org/10.4172/2155-9619.S1.003

Cytotoxic effect of iron oxide nanoparticle with polymer coating as a carrier of 5- fluorouracil and the mega voltage x-ray radiation on prostate cell line

Zahra Hajikarimi, Samide Khoei and **S R Mahdavi**
Iran University of Medical Science, Iran

Objective: Nanotechnology has developed for both cancer diagnosis and therapy. The purpose of this study was to investigate the cytotoxic effect of magnetic nanoparticles as a carrier of 5-fluorouracil and x-ray on the level of proliferation capacity of DU145 prostate carcinoma cell line in monolayer model.

Materials and Methods: Therefore, DU145 cells were cultured as monolayer and treated with different concentrations of 5-FU/or nanoparticles as 5-FU carriers for 24 hours and 2Gy x-ray (6MV). After treatment with nanoparticles, the iron uptake of DU145 cells was monitored using atomic adsorption spectrometry (AAS). The cytotoxic effect of these nanoparticles on the cells was evaluated using the colony formation assay.

Results: Our results indicated that iron content and therefore the cellular uptake of 5-FU loaded nanoparticles increased with the increase of nanoparticles concentrations. The viability of the cells is constant as along with the increase of the concentration of free 5-FU and 5-FU encapsulated in nanoparticles. Our finding showed that proliferation capacity of the cells decreased as along with the increase of the concentration of free 5-FU and PLGA coated iron oxide nanoparticles as a carrier of 5-fluorouracil in combination with x-ray. Our results point to the possibility that iron oxide nanoparticles as 5-fu carrier can affect more efficient that 5-Fu as enhanced radiation.

Conclusion: According to this study, drug loaded nanoparticles could deliver 5-Fu more efficient into the cells. So, magnetic nanoparticles are effective drug delivery vehicles for 5-FU. PLGA coated iron oxide nanoparticles are biocompatible and this coating is an appropriate surface that can penetrate into the cells.

hajikarimi.z@gmail.com

Post-processing in digital radiography. A burden or a blessing?

Robin Decoster, HarrieMol and **Dirk Smits**
Odisee Medical Imaging, Belgium

The dynamic range of modern detectors tolerates a higher detector dose or Detector Air Kerma (DAK) without deteriorating the image quality. The purpose was to investigate the relation between image quality, as overall judgment versus the visibility of well-defined structures, and DAK in clinical radiographs. Furthermore the Contrast-Noise Ratio (CNR) was examined as a measure of image quality. 168 knee and 152 pelvis radiographs were collected randomly in 19 radiologic centers. Six experienced radiologists scored the overall image quality and the visibility of seven different anatomic structures with a Visual Grading Analysis (VGA). The relation between DAK and VGAScore (VGAS) was evaluated. To investigate the role of post-processing, a TOR18FG phantom with 5cm PMMA was exposed to different dose levels. On a low and high contrast element, with and without post-processing, the CNR was calculated. The VGAS was 3.92 for the knee and 3.71 for the pelvis. Intra-observer variability wasn't significant and inter-observer correlations were high and significant. For the pelvis radiographs on computed radiography, a weak but significant correlation was found between DAK and VGAS. The post-processing weakens the DAK-CNR relationship above 4mGy in high contrast elements and nullifies it for low contrast elements. The VGA revealed an image quality higher than diagnostically necessary in both datasets. A hypothesis is that DAK influences the CNR up to a certain point, after which the post-processing is the dominant parameter. CNR saturation, a stagnation of CNR in function of DAK may explain the absence of a relation between DAK and VGAS.

robin.decoster@oidsee.be