

SUMMARY

Objective: The possibilities of CT examinations in patients with multiple trauma are: two-phase, or single-phase CT examination. However, a single-phase contrast medium (CM) administration doesn't suffice quality saturation of arteries along with parenchymal organs. My dissertation is focused on a split-bolus contrast medium administration technique.

Aim: To prove diagnostic quality of protocols using split-bolus technique.

Materials and Methods: Patients were divided into eight groups, namely A to H. After the non-contrast examination of the head and the cervical spine, all patients were examined after CM administration from the skull base to the symphysis. Group A patients underwent a biphasic examination after CM single-bolus, group B patients underwent single-phase examination after a single bolus of CM, and group C–H patients underwent a single-phase examination after split-bolus technique of CM administration. Patients were given 100 ml of CM at the same concentration of 350 mgI/ml. The densities variables in internal carotid arteries, aorta arch, abdominal aorta, common pelvis arteries, liver, v. portae, spleen and kidney were evaluated. The Kruskal-Wallis ANOVA nonparametric statistical method was used to evaluate the variables. The abnormal distribution was found using the Saphiro-Wilk test.

Results: There were statistically significant differences especially in carotid arteries, less in aorta and pelvic arteries. The highest mean values in arteries were found in arterial phase of group A. The lowest measured densities were found in groups B and F. There was a statistically significant difference between groups A and D densities achieved in the liver, while the lowest volume of CM was used in the group D. Furthermore, statistically significant differences in kidney marrow saturation were found. There were no statistically significant differences in parenchymal organs in other groups. Using a single-phase protocol examination, the radiation dose was reduced by 35,4 %.

Conclusion: We achieved a good diagnostic image quality in protocols using a split-bolus technique of CM administration. Usage of SB protocols brings a reduction of radiation dose. The best uniform results were found in protocol used in the group G.