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## **Functional Effects of Contrast Media on the Brain**

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### Functional Effects of Contrast Media on the Brain

Referring to the editorial *No Drug is Benign* (1), we would like to report the results of our previous studies, commanding greater attention to the so-called minor risks of contrast administration, particularly in patients with unstable alteration of the blood-brain barrier (2). Functional damage of the brain can be evaluated by behavioral studies (3) and electrophysiologic exploration (4, 5). In addition to experimental evidence of some alterations of neuronal function after intrathecal administration of contrast media, we described changes in neuropsychological and electrophysiologic parameters (3).

In two series of patients affected by brain lesions with altered blood-brain barrier, we recorded EEG before, during, and after IV administration of contrast media (4, 5). The EEG signals were analyzed quantitatively (computerized spectral analysis). No adverse clinical side effects were observed, but the quantitative analysis revealed that ionic contrast media produced a significant increase of absolute power during injection in the fast bands, whereas the nonionic contrast media produced a decrease of absolute power during injection in the fast bands. The electrophysiologic method, based on computerized spectral analysis, has been confirmed as a useful tool for the evaluation of the effects of contrast media on brain bioelectrical activity. These bioelectrical changes are detectable even when patients do not complain or present with any clinically adverse events.

Our studies confirmed that there may be minor risks related to the use of ionic contrast media, ei-

ther iodinated for CT or paramagnetic for MR imaging. We should be aware of this when injecting any contrast media, and especially when proposing to maximize the amount of contrast media or to overuse a drug (triple dose). There is always a risk. We must weigh the expected results against the possible adverse effects, especially when the blood-brain barrier is weakened, in order to determine whether the expected benefits justify the possible risks.

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### References

1. Latchaw RE. **No drug is benign.** *AJNR Am J Neuroradiol* 1998; 19:1386-1387
2. Salvolini U, Pasquini U, Molinari A, Tirone P. **Adverse effects from contrast media: preliminary results obtained with an experimental model.** In: Amiel M, ed. *Contrast Media in Radiology*. Berlin, Heidelberg: Springer-Verlag;1982;164-168
3. Provinciali L, Signorino M, Giovagnoli AR, et al. **Lumbar myelography with iopamidol: a methodological approach to the investigation of side effects.** *Neuroradiology* 1988;30:528-533
4. Signorino M, Calzolari C, Provinciali L, Menichelli F, Salvolini U. **EEG changes after intravenous ionic and nonionic contrast medium administration.** In: Takahashi M, Korogi Y, Moseley I, eds. *Proceedings of the XV Symposium Neuroradiologicum, Kumamoto, 25 September-1 October 1994*. Berlin: Springer-Verlag;1995;543-545
5. Colombo M, Provinciali L, Signorino M, Polonara G, Regnicolo L, Salvolini U. **Effects of ionic and non-ionic paramagnetic contrast media on brain bio-electric activity.** *ESNR Congress, Lisbon, September 1998.* *Neuroradiology* 1998;40:(suppl 1)S88-89