IN VIVO STUDY OF THE SV2A PROTEIN IN THE KAINIC ACID EPILEPSY RAT MODEL

ME. Serrano, G. Becker, MA. Bahri, C. Warnier, Joël Aerts, F. Mievis, F. Giacomelli, Ch. Lemaire, E. Salmon, A. Luxen, A. Plenevaux

GIGA-Research, CRC In vivo Imaging, Université de Liège

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Contact: meserrano@ulg.ac.be

Introduction

Epilepsy is one of the commonest neurological disorders [1]. Antiepileptic drugs mainly target the SV2A protein [2] but its actual role is still largely unknown. [18F]UCB-H was developed to study in vivo SV2A brain proteins [3, 4].

The present pilot study was undertaken to evaluate for the first time in vivo in rats SV2A expression in the Kaïnic Acid (KA) epilepsy model [5].

Methods

[KAINIC ACID MODEL]

Three male Sprague-Dawley received repeated systemic injections, two with [18F]UCB-H (41 ± 5 MBq IV tail vein) followed by T2 structural MRI.

[SHAM]

9.4T/310 ASR MRI (Philips/Varian)

Image coregistration was done with PMOD 3.6 software. Data were expressed as SUV and areas under the curve were calculated for the different regions.

Results

[18F]UCB-H microPET images showed an important reduction (20-30%) for SV2A after KA injections mainly localized in amygdala, hippocampus, lateral parietal association cortex and cingulate cortex. The rest of the brain was globally unchanged. MRI revealed atrophy and inflammation in amygdala and hippocampus.

Conclusion

These preliminary results obtained in KA treated rats showed that:

- [18F]UCB-H was able to detect important modifications for SV2A in relevant regions for epilepsy
- Our radiotracer appears as a valuable tool to follow in vivo SV2A through longitudinal studies.
- KA model in rats deserves for further development and validation as a tool for the study of epilepsy.