¹¹C-glyburide PET imaging unveils the negligible brain penetration of glyburide in humans

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Neurology® 2019;92:813-814. doi:10.1212/WNL.0000000000007378

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Figure Biodistribution of ¹¹C-glyburide

Summed PET projection (A), brain PET (B), and PET-MRI fusion (C) images obtained in a 30-year-old healthy man after IV injection of ¹¹C-glyburide (60 minutes repeated whole-body scans). ¹¹C-glyburide brain distribution ($V_{T-brain} = 0.023 \text{ mL}\cdot\text{cm}^{-3}$) was estimated using the Logan graphical analysis and the metabolite-corrected arterial input function.

Kimberly et al.¹ reported the beneficial effects of IV glyburide on the clinical outcome of brain edema. We developed the carbon-11 radiolabeled analogue of glyburide to study the body distribution of this compound using PET imaging (figure, A). In a healthy person, the brain distribution of ¹¹C-glyburide matched the cerebral blood volume, suggesting negligible blood–brain barrier (BBB) penetration (figure, B and C). This clinical observation corroborates preclinical findings suggesting that local changes in BBB structure and function are required for targeted delivery and favorable effects of glyburide to the injured brain tissue while minimizing potential side effects to the healthy brain.²

Study registration

EudraCT 2017-001703-69.

Study funding

Supported by the French National Research Agency (IsotoPK, ANR-16-CE17-0011-001).

Disclosure

The authors report no disclosures relevant to the manuscript. Go to Neurology.org/N for full disclosures.

From Imagerie Moléculaire In Vivo (S.M., C.C., F.C., M.B., N.T.), IMIV, Institut des Sciences du Vivant Frédéric Joliot, Direction de la Recherche Fondamentale, CEA, Inserm, CNRS, Paris-Sud University, Université Paris-Saclay, CEA-SHFJ, Orsay; Hôpital Bicêtre (S.M., L.B.), APHP, Le Kremlin Bicêtre; Faculté de Pharmacie (S.M.), Paris-Sud University, Châtenay-Malabry; Department of Pharmacology (L.B.), Paris-Sud University, Faculty of Medicine Paris Sud, INSERM UMR-1178, CESP, Le Kremlin Bicêtre, France.

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Appendix Authors

Name	Location	Role	Contribution
Solène Marie, PharmD	CEA/SHFJ	Author	Analyzed the data, wrote the manuscript, study supervision
Claude Comtat, PhD	CEA/SHFJ	Author	Major role in the acquisition of data
Fabien Caillé, PhD	CEA/SHFJ	Author	Radiotracer production, major role in the acquisition of data
Laurent Becquemont, MD, PhD	Paris Sud University	Author	Major role in the acquisition of data, revised the manuscript for intellectual content
Michel Bottlaender, MD, PhD	CEA/SHFJ	Author	Designed and conceptualized study, major role in the acquisition of data
Nicolas Tournier, PharmD, PhD	CEA/SHFJ	Author	Designed and conceptualized study, drafted the manuscript for intellectual content

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