



HAL
open science

Comments on “Prenatal interventions for fetal growth restriction in animal models: A systematic review”

Matthieu Dap, Pascale Chavatte-Palmer, Olivier Morel, Charline Bertholdt

► To cite this version:

Matthieu Dap, Pascale Chavatte-Palmer, Olivier Morel, Charline Bertholdt. Comments on “Prenatal interventions for fetal growth restriction in animal models: A systematic review”. 2023, 10.1016/j.placenta.2023.07.009 . hal-04170811

HAL Id: hal-04170811

<https://hal.inrae.fr/hal-04170811>

Submitted on 25 Jul 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Comments on “Prenatal interventions for fetal growth restriction in animal models: A systematic review”

ARTICLE INFO

Keywords

Animal models
Placenta
IUGR

We thank Valenzuela et al. for their complete review of prenatal interventions for fetal growth restriction in animal models [1]. We also believe preclinical studies realized with animal models are mandatory to develop new imaging or treating strategies for the management of growth-restricted fetuses.

However, the authors did not develop a major endpoint regarding the choice of the model and the interpretation of the results of each experiment: the type of placenta and the kinetics of development of the fetuses of each species used. These two aspects are at least as important than the procedure itself to assess the research's applicability to humans.

Our team described in details the type of placentation and the specificities of fetal development of the most current models used for the preclinical study of pregnancy in a review paper published in 2012 [2]. If placental physiology is the main objective of experiments, animal models with a hemo-chorial placenta should be preferred [3]. We think that the rabbit has clear advantages over other animals, first of all: a placental morphology and function similar to the human one and high similarities in fetal development [4,5]. Rabbit is also a well-known and described natural model of IUGR, and several interventions (pharmacological, surgical and environmental) have been detailed in previous works since the 50's [6]. Finally, the rabbit has other benefits, such as a short pregnancy and polycotous that allow case/control studies. It is also of relatively large size making it possible to use current ultrasound equipments [7].

Declaration of competing interest

None.

References

- [1] I. Valenzuela, M. Kinoshita, J. van der Merwe, K. Maršál, J. Deprest, Prenatal interventions for fetal growth restriction in animal models: a systematic review, *Placenta* 126 (2022) 90–113, <https://doi.org/10.1016/j.placenta.2022.06.007>.

- [2] O. Morel, B. Laporte-Broux, A. Tarrade, P. Chavatte-Palmer, The use of ruminant models in biomedical perinatal research, *Theriogenology* 78 (8) (2012) 1763–1773, <https://doi.org/10.1016/j.theriogenology.2012.06.012>.
- [3] P. Chavatte-Palmer, A. Tarrade, Placentation in different mammalian species, *Ann. Endocrinol. (Paris)* 77 (2) (2016) 67–74, <https://doi.org/10.1016/j.ando.2016.04.006>.
- [4] G.J. Burton, E. Jauniaux, Pathophysiology of placental-derived fetal growth restriction, *Am. J. Obstet. Gynecol.* 218 (2S) (2018) S745–S761, <https://doi.org/10.1016/j.ajog.2017.11.577>.
- [5] A.M. Swanson, A.L. David, Animal models of fetal growth restriction: considerations for translational medicine, *Placenta* 36 (6) (2015) 623–630, <https://doi.org/10.1016/j.placenta.2015.03.003>.
- [6] J. Lopez-Tello, M. Arias-Alvarez, A. Gonzalez-Bulnes, A.N. Sferuzzi-Perri, Models of Intrauterine growth restriction and fetal programming in rabbits, *Mol. Reprod. Dev.* 86 (12) (2019) 1781–1809, <https://doi.org/10.1002/mrd.23271>.
- [7] E. Lecarpentier, O. Morel, A. Tarrade, et al., Quantification of utero-placental vascularization in a rabbit model of IUGR with three-dimensional power Doppler angiography, *Placenta* 33 (10) (2012) 769–775, <https://doi.org/10.1016/j.placenta.2012.06.013>.

Matthieu Dap*

Obstetric and Fetal Medicine Unit, Centre Hospitalier Régional Universitaire of Nancy, Nancy, France
Department of Foetopathology and Placental Pathology, Centre Hospitalier Régional Universitaire of Nancy, Nancy, France
INSERM U1254, IADI, Vandoeuvre-lès-Nancy, France

Pascale Chavatte-Palmer
UMR BDR, INRA, ENVA, Université Paris Saclay, 78350, Jouy en Josas, France

Olivier Morel, Charline Bertholdt
Obstetric and Fetal Medicine Unit, Centre Hospitalier Régional Universitaire of Nancy, Nancy, France
INSERM U1254, IADI, Vandoeuvre-lès-Nancy, France

* Corresponding author. 10 rue du Docteur Heydenreich, 54000, Nancy, France.

E-mail address: matthieudap@gmail.com (M. Dap).

<https://doi.org/10.1016/j.placenta.2023.07.009>

Received 14 September 2022; Accepted 10 July 2023

Available online 17 July 2023

0143-4004/© 2023 Elsevier Ltd. All rights reserved.