

## **Glyphosate presence in human sperm: first report and positive correlation with oxidative stress in an infertile French population**

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Environmental exposure to endocrine disruptors, such as pesticides, is suspected to have contributed to a decline of human fertility. Glyphosate (GLY) is the main component of Glyphosate Based Herbicides (GBHs) which are the most commonly herbicides used in the world. Various animal model studies demonstrated its reprotoxicity. In Europe, GLY authorization in agriculture is extended until 2033 and the toxicity of GLY in humans is still in debate.

The aims of our study were firstly to analyse the concentration of GLY and its main metabolite, amino-methyl-phosphonic acid (AMPA) by LC/MS-MS in the seminal and blood plasma in an infertile French men population (n=128). We secondly determined some oxidative stress biomarkers including malondialdehyde (MDA) and 8-hydroxy-2'-deoxyguanosine (8-OHdG) by ELISA assays. We next analysed potential correlation between GLY and oxidative stress biomarkers concentration and sperm parameters (sperm concentration, progressive speed, anormal forms).

Here, we detected for the first time GLY in the human seminal plasma in significant proportion and we showed that its concentration was four times higher than those observed in blood plasma. At the opposite, AMPA was undetectable. We also observed a strong positive correlation between plasma blood GLY concentrations and plasma seminal GLY and 8-OHdG concentrations, the latter reflecting DNA impact. In addition, MDA blood and seminal plasma concentrations were significantly higher in men with glyphosate in blood and seminal plasma, respectively.

Taken together, our results suggest a negative impact of GLY on the man reproductive health and possibly on his progeny. A precaution principle should be applied at the time of the actual discussion of GLY and GBHs formulants uses in Europe by the authorities.