

## Nitro-oxidative stress in neonatal emergencies: Hypoxo-ischemia and hypoglycemia

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An important proportion of brain lesions leading to infantile handicap occur during the perinatal period. The main causes of perinatal brain damage, hypoxo-ischemia, infection and hypoglycaemia, occur in both preterm and term infants. Perinatal asphyxia is a public health problem as it occurs frequently and can lead in severe cases, to significant neonatal mortality and permanent brain damage with impaired psycho-motor and behavioural development. Hypoxo-ischemia triggers the generation of peroxynitrite leading to nitro-oxidative stress (NOS) which initiates a vicious circle causing neuronal apoptosis.

Hypoglycaemia is another condition potentially leading to brain damage and is very frequent during the first days of life especially in low birth weight infants. Hypoglycemia may occur as soon as the first hour of life being either transient or recurrent. Apart from severe prolonged hypoglycemia, the clinical significance of neonatal hypoglycemia is the matter of a huge debate. While some authors reported that even moderate hypoglycemia is associated with neurocognitive impairment when repeated events occur during the early life, others disagree with this view. We found one of the consequences of recurrent and severe hypoglycaemia to be peroxynitrite generation.

Both asphyxia and hypoglycaemia thus share some common biochemical consequences which can cause brain lesions. Understanding the mechanisms leading to apoptosis is obviously crucial for the development of secondary prevention strategies. We have developed a sensitive ELISA assay for the quantitative determination of plasma nitroalbumin, a specific biomarker of peroxynitrite generation.

Results obtained with this novel biomarker in clinical studies of neonatal asphyxia and hypoglycemia will be discussed.

### Biography

Serge Bottari obtained his M.D. and Ph. D from the Free University Brussels, Belgium and post-doctoral studies from the University Of California San Francisco School Of Medicine. He is professor of Cell Biology at Grenoble University Medical School, Head of Radio-analysis laboratory at the University Hospital and Senior Scientist at the Laboratory for Fundamental and Applied Bioenergetics in Grenoble, France. He has published more than 50 papers in peer-reviewed international journals and serves as an editorial board member in several journals as well. His major research interests are the role of reactive nitrogen species in pathophysiology and the development of novel biomarkers for the screening, diagnosis and follow-up of chronic diseases including insulin resistance, inflammation, COPD and thrombo-embolic risk.

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