# AB013. Sildenafil treatment following term neonatal hypoxia-ischemia may modulate inflammation by regulating gliosis

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**Background:** Hypoxic-ischemic injuries following birth asphyxia often lead to long-term neurological sequelae, including visual impairments, due to cortical and retinal injuries in affected neonates. Although treatment with sildenafil has been shown to improve retinal function following term neonatal asphyxia, the underlying mode of action explaining this improvement remains yet to be elucidated. Our goal is to determine the impact of sildenafil on retinal neurons and glial cells following hypoxic-ischemic injury.

**Methods:** Neonatal hypoxia-ischemia (HI) was induced in male Long-Evans rat pups at postnatal day 10 (P10) by left common carotid ligation followed by 2-hour exposure to 8% oxygen. 12 hours following HI, animals were randomly administered 0 (vehicle), 2, 10 or 50 mg/kg of sildenafil for 7 consecutive days. At P30, rats were sacrificed and their eyes were extracted. Immunohistochemistry was performed to examine retinal ganglion cells (Brn3a), bipolar cells (Chx10), astrocytes (GFAP) and microglia (Iba1) in order to assess the neuronal count and the inflammatory response in the retina following HI and the impact of the sildenafil treatment. In addition, the ratio of activated to non-activated Muller cells was assessed by co-staining Nestin and GS respectively.

**Results:** In the retina, HI caused a decrease in the number of retinal ganglion cells and bipolar cells, as well as an increase in inflammation marked by an increase in the number of astrocytes and an increase in the ratio of activated to non-activated Muller cells. Sildenafil treatment restored the number of retinal ganglion cells and bipolar cells, as well as reduced neuroinflammation by decreasing the number of astrocytes and the number of activated Muller cells.

**Conclusions:** Sildenafil seems to improve retinal injuries by reestablishing retinal neuron numbers back to sham levels and modulating inflammation following HI.

**Keywords:** Birth asphyxia; sildenafil; inflammation; retina

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