

Serum amyloid A

Serum **amyloid A** (SAA) is an acute phase protein upregulated in the liver after traumatic brain injury (TBI). So far, it has not been investigated whether SAA expression also occurs in the brain in response to TBI. For this, we performed a moderate controlled cortical impact injury in adult male and female mice and analyzed brain, blood, and liver samples at 6 h, 1, 3, and 10 days post-injury (dpi). We measured the levels of SAA in serum, brain and liver by western blot. We also used immunohistochemical techniques combined with in situ hybridization to determine SAA mRNA and protein expression in the brain. Our results revealed higher levels of SAA in the bloodstream in males compared to females at 6 h post-TBI. Liver and serum SAA protein showed a peak of expression at 1 dpi followed by a decrease at 3 to 10 dpi in both sexes. Both SAA mRNA and protein expression colocalize with astrocytes and macrophages/microglia in the cortex, corpus callosum, thalamus, and hippocampus after TBI. For the first time, here we show that SAA is expressed in the brain in response to TBI. Collectively, SAA expression was higher in males compared to females, and in association with the sex-dependent neuroinflammatory response after brain injury. We suggest that SAA could be a crucial protein associated to the acute neuroinflammation following TBI, not only for its hepatic upregulation but also for its expression in the injured brain ¹⁾.

Unclassified

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