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10th FENS Forum of Neuroscience

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Organised by the Federation of European Neuroscience Societies (FENS)

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Theme	C. Disorders of the nervous system
Topic	C13. Neurotoxicity, inflammation, and neuroprotection
Presentation preference	Poster presentation
Abstract title	Morphological traits of surveillant/activated microglia during an experimentally induced acute neuroinflammatory process

Several studies show that morphological changes of microglia over the course of inflammation are tightly coupled to function. However the progressive transformation into activated microglia is poorly characterized.

AIMS: This study aimed to establish a spatiotemporal correlation between quantifiable morphological parameters of microglia and the spread of an acute ventricular inflammatory process.

METHODS: Inflammation was induced by a single injection of the enzyme neuraminidase within the lateral ventricle of rats. Animals were sacrificed 2, 4 and 12 hours after injection. Coronal slices were immunostained with Iba1 to label microglia and with IL1 β to delimit the spread of inflammation. Digital images were obtained by scanning the labelled sections. Single microglia images were randomly selected from periventricular areas of caudate putamen, hippocampus and hypothalamus. *FracLac* for *ImageJ* software was used to measure the following morphological parameters: fractal dimension, lacunarity, area, perimeter and density.

RESULTS: Significant differences were found in fractal dimension, lacunarity, perimeter and density of microglia cells of neuraminidase injected rats compared to sham animals. However no differences were found in the parameter "area". In hippocampus there was a delay in the significant change of the measured parameters. These morphological changes correlated with IL1 β -expression in the same areas.

CONCLUSIONS: Ventricular inflammation induced by neuraminidase provokes quantifiable morphological changes in microglia restricted to areas labelled with IL1 β . Morphological parameters of microglia such as fractal dimension, lacunarity, perimeter and density are sensitive and valuable tools to quantify activation. However, the extensively used parameter "area" did not change upon microglia activation.

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