
6.3 Neuroglia

Glia reacts very prominently towards many CNS diseases. The neuroglial cells have **supportive and nutritional functions**.

1. **Astrocytes**, having many fiber branches, serve as supportive cells. The nutritional function of astrocytes is enabled by the fact that part of its branches is situated on the endothelial cells that form the wall of the capillaries (known as vascular ped). From this site they acquire the nutritional substances and transport them to the nerve cells. Upon neuronal injury the astrocytes together with the microglial cells phagocytose the detritus and the products of digestion and form the so called glial scar. They are less vulnerable than the neurons. They share in the formation of scar in a way that they produce and increase the fibrin formation, later on the cells with atrophy and there will be the formation of a thick fibrinous network. This process is called **gliosis**. Gliosis accompanies many diseases and it is analogous with scar formation. The collagen scar forms in CNS only upon the injury to mesodermal structures such as for e.g. the vascular tissue.
2. **Oligodendrocytes** are small cells with short branches. They perform mainly nutritional functions in relation to neurons. It is mainly seen during neuronal injury. Upon neuronal injury the number of oligodendrocytes increases, and cells become enlarged. The whole process is known as satellitosis.

The microglial cells are part of the mononuclear phagocytic system. Their reaction is best seen upon tissue necrosis, around the infarct. The activated large foamy cells phagocytose lipids, haemosiderin, and others. They are very different from the small inactive microglial cells. According to the shape and type of phagocytosed material those cells are variably marked as: lipophages, foamy cells or so the called gitter cells.

6.4 The basic etiopathogenetic factors in the nervous system disturbances

The etiopathogenic factors, that cause nervous system diseases, are classified depending on many conditions. One of the basic classifications is a classification into two groups: (1) **intrinsic** and (2) **extrinsic ones**. Although this is a general and very wide division, it is not possible to enclose all the diseases within the mentioned groups because both **the groups are interchanged and interconnected** with each other.

Diseases of the nervous system from **the etiopathogenetical** point of view are divided into three groups:

1. diseases with mainly intrinsic causes,
2. diseases with mainly extrinsic causes,
3. diseases with mixed or possibly unknown etiology.

6.4.1 Diseases with mainly intrinsic causes

An important subgroup of this group are **the genetically conditioned diseases**. Changes of **the chromosomal number** are very often associated with developmental disorders of the nervous system, for e.g. trisomy of the 21st chromosome – Down syndrome). **Down syndrome** is characterized by a prominently slow mental development, with the typical mongoloid expression of the face (sometimes marked as mongolism) and brachiocephaly.

Another cause might be changes of **the chromosomal structures**, and hence their abnormality (2) for e.g. changes in sequence of the DNA on the short arm of chromosome the 4th are the cause of **Huntington chorea**, that is manifested by choreatic movements with the consequent loss of intellect. As a differentiation from the Parkinson disease the amount of dopamine in the basal ganglia is higher.

The 3rd group of the genetically conditioned diseases is composed of many diseases in which the injury of disturbance of function is not localized.