6.18.4.2 Changes of behavior, tolerance, dependance

The most important problem of ethanol intake is the problem to ditermine the maximal daily dose that could not cause dependance nor organic or personality changes. According to Ontario Research Fondation an alcoholic is a person who uses what is equivalent to 150 ml absolute alcohol daily (2.5 dl destilate, or 7.5 dl wine or 5 bottles of bear).

According to specialists "the safe" daily dose ranges between 60 up to 100 g absolute alcohol, reminding that a long term use of such a small amount also causes organic changes. We should not forget that there is an interindividual variability that is very important in the tolerance to alcohol. After 1–2 weeks of regular alcohol use the tolerance increases by 30 %. Ethanol has a caloric value of 7.1 kcal (30 kj)/g. This enables the coverage of the daily caloric need with alcohol drinks. Yet their biological value is minimal, because they do not contain minerals, proteins, nor vitamins. Ethanol lowers vitamin absorbtion (mainly vitamin B) in the small intestine and hence cause its deficiency. Thiamin deficiency is responsible for Korsakoffd's syndrom.

In cases of chronic ethanol abuse (probably due to membrane disturbances) the ionic distribution is changed. The level of K^+, Mg^{+2}, Ca^{2+}, Zn^{+2} and P in the serum is lower. And the level of Na^+ in the serum is increased because the Na^+ will flow out of cells. The acid base balance might be disturbed as well in term of acidosis. The intake of a higher amount of ethanol might cause a transiet hypoglycemia within 6–36 hours. Due to the ethanol effect on gluconeogenesis. The hypoglycemia effect of alcohol is potentiated by poor nutrition. This is why alcoholic patients might develop disturbed glucose tolerance after few days of abstinance.

6.18.4.3 The effect of ethanol on central nervous system

Upon a single use of a high dose there will be some changes in the behavior that depends on the ethanol concentration in the blood and organs. A very low concentration promotes sleep and shortens the REM sleep before midnight, and after midnight the dreams are multiple and nightmares might appear. In some individuals ethanol might cause fragmetation of sleep the so called frequent waking up.

Chronic abuse of alcohol causes peripheral neuropathy in 5 upto 15 % alcoholics. The cause is probably thiamin deficiency and acetaldehyde. Patients complain of parasthesia and burning feeling in all limbs, especially the peripheral parts.

A serious complication of alcoholism is Korsakoffd's syndrom. It develops in people with an inborn defect of transketolase. Patients with Korsakoffd's syndrom show a retrograde and anterograde (disability to learn) amnezia, comfabulation (and hence fill the defect in the past events, and they believe their own stories), are emotionally labile. Their intelectual ability is not always affected. Some alcoholics are suffering from cerebellar degeneration. The nervous cells in the cerebellum die due to the toxic effect of ethanol and acetaldehyde. Vitamin deficiency is another co-factor.

Not only cerebellar neurones are affected by ethanol and acetaldehyde. The decreasing brain volume is manifested by an increasing volume of the brain ventricles, and the development of alcoholic dementia. The old doctors used to say that alcohol is the greatest pretender, and in chronic alcohol abusers we might register all forms of psychological diseases e.g. dementia, depression, all forms of psychoses, states of hallucination, and paranoid cases.

6.19 Tumors of the nervous system

Brain tumors can grow directly from the brain tissue, mostly from the microglial cells, from the cranial nerves, or from the brain coverings (meningi). Tumors that arise from the brain tissue usually infiltrate the surroundings, and there are no defined borders between the tumor and the healthy surrounding tissue. Tumors that grow from cranial nerves are called **neurinomes** and those arising from the meningi are called **meningeomes**. They cause pressure on the brain tissue, increase the intracranial pressure and in some localizations they might block the cerebrospinal fluid circulation, and it will accumulate in the brain ventricles. This is how the intracranial pressure is raised and brain edema might

develop, some signs and symptoms due to local dysfunction of some brain centers or pathways might appear. Apart from this there will be some general signs (headache, vomiting, blurred vision). When the frontal lobe is involved by a tumor process there will be some psychological changes, if the parietal lobe is affected there will be epileptic seizures together with the psychological changes. Attacks of spasm and paralysis on the contralateral side occur when there is a tumor in the temporal lobe. When the occipital lobe is affected, some visual disturbances will appear (scotomes in the visual field.) Expansive processes in the posterior cranial cavity is manifested with cerebellar and cranial nerves dysfunction. Some characteristic signs and symptoms accompany hypophysial tumors, craniopharyngeomas, and vestibular nerve neurinomes that could be diagnosed by the charecteristic bony changes. Apart from the histological classification of tumors into benign and malignant we have to think about some **malignant tumors due to their position** when dealing with brain tumors.

Tumors of the spinal cord can arise directly from the spinal tissue. They either grow inside the spinal cord (**intra medullary tumors**) or they grow from the spinal nerves or spinal cord coverings (**extra medullary tumors**), or they might arise from the vertebral column (**extra dural tumors**). The extra medullary and extradural tumors compress the spine from outside. **Metastatic tumors** (most commonly in ca lung, ca prostate, renal carcinoma, tumors of the thyroid gland, and the ca brest) usually grow from the outside into the spinal coverings (extradurally) . Tumors of the spine are manifested by backache that commonly radiate along the spinal nerves and their enervation sites. Spinal compression will reveal some motor disturbance of the limbs (paraparesis paraplegia, quadriparesis, or quadriplegia), disturbances of sensation and disturbances of sphincter function. Benign tumors of the spine appear on x-ray due to their pressure changes, while the malignant tumors show distructive changes.

6.20 Injury of the spine

The primary pathological process plays role in the anatomical and functional outcomes of the spinal injury. There is no space to compensate the pressure or volume changes and this has got a very serious outcomes. An example of this might be fructure or dislocation of spinal vertebra, a tumor (usually secondary) that expands into the the spinal canal, disc prolapse, or meningeal tumor that causes compression of the nervous tissue.

The spinal cord is very similar to the brain tissue, the anterior and posterior roots as well as the vesseles are freely situated in the watery enviroment of the cerebrospinal fluid. Upon compression there will be some injury to the nervous and neuronal pathways and the extension of this injury depends on the seriousness and time length of the compression. The injury might be in the mild cases only focal, yet in the complicated cases there might be **a transverse lesion of the spinal cord** – a complete discontinuation of the spinal cord. The vascular compression leads to tissue infarction, and there might be an extensive injury to the nervous tracts and pathways with the consequent loss of function. This is commonly a complication of mechanical injury. Upon compression there will be some traction of tissue and coverings that can cause a secondary injury to the spinal roots for example. This might result in **radicutilis and spondylosis**. At the level of the lesion connections between the sensory and the motor fibers will be discontinued, those connections form the spinal reflex arch. According to the extent of injury there might even be a complete discontinuation of the longitudinal spinal tracts and hence disturbance in the regulatory effect of the brain on the regions below the lesion. There will be mascular paralysis and a loos of sensation below the lesion. Spinal reflexes below the lesion are not affected.

6.20.1 Ascending and descending degeneration

Long axons that are disconnected with their bodies will undergo progressive degeneration. Upon a