

Abstract:

Clinical surgical techniques of pinealectomy and intracerebroventricular (i.c.v.) cannulation are still used in the clinic in indicated cases. In research, there is an effort to replace these classical surgical techniques by other means. However, these various new models often do not reflect the complexity of the functions taking place in the living organism as a whole. The thesis shows that these surgical techniques should be also a part of biomedical research in the future, as they still bring new important information. In the experiment, the pinealectomy can serve as a model of resection or depletion (removal of natural hormone secretion), while i.c.v. application of the active substance to the ventricles on the contrary as a model of addition or substitution.

The practical part of the thesis is divided into 4 areas: A) pinealectomy – an animal models, B) pinealectomy - in the experiment, C) pinealectomy - in the clinical practice and D) intracerebroventricular application - in the experiment. The work describes in detail the surgical techniques and discuss possible consequences of pinealectomy in 6 animal species (and their comparison) and in humans. It also includes an experiment with pinealectomy in a rat and a clinical study in patients with pineal cyst and subsequent pinealectomy. The work also contains a detailed description of the i.c.v. application, cannulation of vessels and telemetric measurement of functional parameters of blood circulation in the rat. The appendix contains 4 impacted publications containing the selected topic.

Keywords:

pinealectomy, intracerebroventricular (i.c.v.) application, cannulation, melatonin, rat, mouse, guinea pig, rabbit, pig, dog