

STRESZCZENIE W JĘZYKU ANGIELSKIM

Retinoblastoma is the most common intraocular malignancy affecting children. If left untreated, retinoblastoma spreads to other parts of the body, leading to a fatal outcome.

Currently, the most important methods for treating retinoblastoma include systemic chemotherapy (administered intravenously) and selective focal intraarterial chemotherapy. They are complemented by adjuvant focal therapies, such as transpupillary thermotherapy, laser photocoagulation, cryotherapy, brachytherapy, and intravitreal chemotherapy.

The doctoral dissertation, which is a series of publications, aims to assess the effectiveness of modern methods of local treatment of retinoblastoma, in particular intravitreal injections of melphalan, transpupillary laser thermotherapy with intravenous administration of indocyanine and brachytherapy with the use of radioactive plate ^{106}Ru .

The aim of the first study was evaluation of efficacy of indocyanine green enhanced transpupillary thermotherapy (ICG-TTT) as a single treatment for recurrence of retinoblastoma.

Material and methods: Single-center, retrospective study of 18 procedures in 11 eyes of 11 retinoblastoma patients (12 tumors), with a mean follow-up of 31.94 months (range 1-44 months). Nine tumors had one procedure of ICG-TTT and 3 tumors had more than one procedure due to relapses. The technique involved applying thermotherapy (TTT) via an indirect ophthalmoscope 30 seconds after intravenous indocyanine administration at a dose of 0.6 mg/kg.

Results: During follow-up, tumor recurrence after ICG-TTT developed after 11 procedures. Taking into account cases where ICG-TTT was the only treatment for retinoblastoma relapse, the success rate was 26.7% (4 effective procedures out of 15). Overall, tumor control and globe salvage was achieved in all eyes with ICG-TTT alone or with other forms of therapy, e.g. systemic chemotherapy, ophthalmic artery chemosurgery, brachytherapy.

Conclusions: ICG-TTT as the only procedure for relapses of retinoblastoma has a moderate success rate. No ocular or systemic complications were noted.

Aim of the second study was to evaluate the efficacy of ^{106}Ru episcleral brachytherapy for the treatment of retinoblastoma.

Material and methods: Retrospective series of 13 children with retinoblastoma treated with ^{106}Ru plaques.

Results: A total of 13 tumors were treated with ^{106}Ru brachytherapy. In all cases it was a salvage treatment for tumors resistant to other treatment modalities, after a mean of 3.15 relapses. Overall tumor control was achieved in 12 cases (92.3%). Tumor recurrence was observed in 1 case (7.7%) which led to enucleation. Radiation complications included persistent hemorrhages from neovascularization in 4 cases (30.8%).

Conclusions: ^{106}Ru brachytherapy can be an effective salvage treatment for retinoblastoma.

The aim of third study was to evaluate the results of IVIM to treat retinoblastoma vitreous seeding.

Materials and methods. This was a clinical, retrospective, single-center study. Twenty six children (27 eyes) who met all of the following inclusion criteria qualified for the study: 1) active vitreous seeding at the time of retinoblastoma diagnosis; 2) IVIM performed between 1 January 2017 and 30 September 2020; and 3) a minimum follow-up period of 12 months since the last IVIM. Doses of 20–40 μg melphalan per injection were used.

Results. The eye observation period from the last IVIM to the last ophthalmic examination averaged 32.41 months (median 30.00; range 13.00–56.00). Success (no active tumors in the vitreous body) was achieved in 24 eyes (88.9%), and a doubtful result (recurrence in the retina with a difficult-to-determine etiology) in 2 eyes (7.4%). In 1 eye (3.7%), despite treatment, active tumors were still present in the vitreous body. Out of all 27 eyes, 4 eyeballs were removed, but the direct cause of enucleation was not vitreous seeding. There were no complications in the form of intraocular inflammation, extraocular retinoblastoma or distant metastases. There was 1 case of anterior uveitis and 1 case of cataract.

Conclusions. The IVIM is a highly effective and safe form of treatment for retinoblastoma vitreous seeding.

The fourth study was review article on focal therapies for retinoblastoma.

The article discusses the methods of focal treatment of retinoblastoma: cryotherapy, transpupillary laser thermotherapy, transpupillary laser thermotherapy with intravenous indocyanine, brachytherapy, enucleation, and intraarterial and bicameral injections of melphalan. Particular attention is given to the latest methods of treatment including topical chemotherapy (intravitreal injections) and intraarterial chemotherapy. These modern topical treatments help salvage the eye in an increasing number of patients with advanced retinoblastoma.

Conclusions

Methods of local treatment of retinoblastoma significantly differ in effectiveness. Considering each of them separately, the least effective seems to be transpupillary laser thermotherapy with intravenous administration of indocyanine (about 26% effectiveness in the treatment of retinal tumors), more effective intravitreal chemotherapy with melphalan (at least 88% effectiveness in the treatment of tumors in the vitreous body of the eye), and the most effective is ^{106}Ru brachytherapy (about 92% effectiveness in the treatment of retinal tumors). Modern treatment of retinoblastoma involves the combined use of many different

therapeutic methods, which allows for high therapeutic effectiveness while minimizing side effects. Proper application of the described methods of treatment allows for the preservation of life, eyeball and often useful visual acuity in treated children.