Melphalan for Retinoblastoma

- Intra-Arterial Melphalan Chemotherapy for Retinoblastoma in a Developing Nation: Real-World Outcomes and Prognostic Factors
- Do's and Don'ts" for intraarterial chemotherapy for retinoblastoma- What ophthalmologist and interventional radiologist need to know?
- Onset and Resolution of Ocular Motor Cranial Nerve Palsies Following the Use of Intra-Arterial Chemotherapy for Retinoblastoma
- Comparison of single- versus multi-drug treatment for intra-arterial chemotherapy (IAC) in children with retinoblastoma
- Changes of Cytokines in Aqueous Humor of Retinoblastoma with Intravitreal Melphalan
- Ophthalmic Artery Chemosurgery for Retinoblastoma Babies Less than 3 Months Old or under 6-kg Weight
- Intraarterial Chemotherapy for Retinoblastoma, Outcomes Analysis in 357 Eyes: Thirteen Years of Experience in a Referral Center in Brazil
- Effect of intra-arterial chemotherapy drug regimens on globe salvage outcomes of retinoblastoma patients

---

Melphalan, which is poorly soluble at room temperature, is widely used for retinoblastoma treatment by selective ophthalmic artery infusion. Evomela, a propylene glycol-free formulation of melphalan with improved solubility and stability, has recently been used as an alternative.To compare the safety and efficacy of Evomela with standard-formulation melphalan (SFM) in the treatment of retinoblastoma by selective ophthalmic artery infusion.

Jubran et al. performed a retrospective case-control study of patients with retinoblastoma undergoing selective ophthalmic artery infusion with SFM or Evomela at a single institution. Cycle-specific percent tumor regression (CSPTR) was estimated by comparing photos obtained during pretreatment examination under anesthesia (EUA) with those obtained during post-treatment EUA 3-4 weeks later. CSPTR, ocular salvage rates, complication rates, operation times (unadjusted and adjusted for difficulty of ophthalmic artery catheterization), and intraprocedural dose expiration rates were compared between Evomela- and SFM-treated groups. Univariate and multivariate analyses were performed.

Ninety-seven operations (melphalan: 45; Evomela: 52) for 23 patients with 27 retinoblastomas were studied. The ocular salvage rate was 79% in the SFM-treated group and 69% in the Evomela-treated group. Multivariate regression controlling for tumor grade, patient age, and treatment history revealed no significant differences in ocular salvage rate, CSPTR, complication rates, or operation times. Although the dose expiration rate was higher for the SFM-treated group, the difference was not statistically significant. Notably, there were no ocular or cerebral ischemic complications.

Evomela has non-inferior safety and efficacy relative to SFM when used for the treatment of retinoblastoma by selective ophthalmic artery infusion [1)].

All patients with retinoblastoma treated by selective ophthalmic artery infusion chemotherapy at a single center during a 9-year period were reviewed. Only first-cycle treatments for previously

untreated eyes were studied. Adjunctive factors (intra-arterial verapamil, intranasal oxymetazoline external carotid balloon occlusion) and technical factors (chemotherapy infusion time, fluoroscopy time) were documented by medical record review. Quantitative tumor reduction was determined by blinded comparison of retinal imaging acquired during examination under anesthesia before and 3-4 weeks after treatment. The dichotomous therapeutic response was classified according to quantitative tumor reduction as satisfactory (≥ 50%) or poor (<50%).

Results: Twenty-one eyes met the inclusion criteria. Patients ranged from 2 to 59 months of age. Adjuncts included intra-arterial verapamil in 15, intranasal oxymetazoline in 14, and external carotid balloon occlusion in 14. Quantitative tumor reduction ranged from 15% to 95%. Six showed poor dichotomous therapeutic response. A satisfactory dichotomous therapeutic response was correlated with intra-arterial verapamil (P = .03) in the aggregate cohort and in a subgroup undergoing treatment with single-agent melphalan at a dose of <5 mg (P = .02). In the latter, higher average quantitative tumor reduction correlated with intra-arterial verapamil (P < .01).

Conclusions: Intra-arterial verapamil during selective ophthalmic artery infusion chemotherapy is correlated with an improved therapeutic response, particularly when treating with lower doses of single-agent melphalan [2].

1)
Jubran JH, Luong H, Naik A, Srinivasan VM, Ramasubramanian A, Li A, Scherschinski L, Feldman MJ, Albuquerque FC, Abruzzo TA. Efficacy of a prolonged stability melphalan formulation for intra-arterial treatment of retinoblastoma. J Neurointerv Surg. 2023 Jun 28:jnis-2023-020170. doi: 10.1136/jnis-2023-020170. Epub ahead of print. PMID: 37380354.
2)
Abruzzo T, Abraham K, Karani KB, Geller JI, Vadivelu S, Racadio JM, Zhang B, Correa ZM. Correlation of Technical and Adjunctive Factors with Quantitative Tumor Reduction in Children Undergoing Selective Ophthalmic Artery Infusion Chemotherapy for Retinoblastoma. AJNR Am J Neuroradiol. 2021 Jan;42(2):354-361. doi: 10.3174/ajnr.A6905. Epub 2020 Dec 24. PMID: 33361377; PMCID: PMC7872184.