Advancements in super-selective catheterization and drug selection for intra-arterial chemotherapy for retinoblastoma, a 15-year evolution

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Abstract

Background: Retinoblastoma (Rb) is the most common primary ocular malignancy of childhood, untreated it is 100% fatal and carries a substantial risk for impaired vision and removal of one or both eyes. Intraarterial chemotherapy (IAC) for Rb is a well-established adjunct to the treatment paradigm for Rb that allows for better eye salvage and vision preservation without compromising survival. However, there is still room for advancements in IAC technique

Methods: A retrospective chart review was conducted for 571 patients (697 eyes) and 2391 successful IAC sessions over 15 years. This cohort was separated into three 5-year periods (P1-P3) to assess trends in IAC catheterization technique and drug delivery.

Results: From a total of 2402 attempted IAC sessions, there were 2391 successful IAC deliveries, consistent with a 99.5% success rate. The rate of successful overall catheterizations and IAC delivery ranged from 99.03% - 100% between the three periods. The rate of successful super-selective catheterizations without a guide catheter or balloon over the three periods ranged from 80% in P1, 84.85% in P2, to 89.18% in P3. Chemotherapeutics used included combinations of melphalan, topotecan and carboplatin. The rate of patients receiving triple-therapy among all groups ranged from 128 (20.98%) in P1, 487 (41.91%) in P2, to 413 (66.72%) in P3. Combination chemotherapy was significantly more prevalent with each new period (X2 (7, N = 2391) = 573.5, p < 0.00001)).

Conclusions: The overall rate of successful catheterization and IAC delivery remains high over 15 years. With more advanced routes of vascular access, the rates of successful IAC with super-selective catheterization have increased. There is a statistically significant trend towards triple therapy with melphalan, topotecan and carboplatin amongst all groups.