

Commentary: The shift to intra-arterial chemotherapy – Relevance in Indian context

A study comparing the outcomes of intra-arterial chemotherapy (IAC) versus intravenous chemotherapy (IVC) versus treatment in the prechemotherapy era in older children appears in this issue of *Indian journal of Ophthalmology*.^[1]

The authors find IAC to be safe and effective with better globe salvage rates and less need for external beam radiation therapy. Retinoblastoma in older patients presents with some unique challenges – these are advanced tumors, more often requiring enucleation, the threshold for enucleation being lower considering that older patients are more likely to have unilateral disease. An advanced, unilateral retinoblastoma is more often primarily enucleated in contrast to a bilateral disease wherein one would attempt some form of chemotherapy with the aim to salvage at least one of the eyes, eventually ending up with salvaging both eyes in a significant number of patients.

The authors of this study did not find metastasis or death in the 13 patients treated with IAC. One, however, has to note that the mean follow-up is only 14 months, limiting the validity of this observation from this study, but the large volume of data on IAC from other studies also do not show increased risk of metastasis or death.

Bilateral retinoblastoma usually presents early. It is of note that three patients in this series had bilateral disease, but presented after 5 years of age. While rare, occurrence of bilateral disease has been reported in older children by other authors as well.^[2] This reiterates the fact that even if a child were to present with retinoblastoma, later in life, it is imperative that both eyes are carefully examined looking for the presence of bilateral disease, thereby the genetic implications of the disease.

IAC has become the first choice of treatment to treat retinoblastoma in developed nations. It avoids systemic complications of IVC, which may require expensive hospitalization to manage them at the cost of significant morbidity as well. The technique of IAC may be relatively easier

in older patients considering the larger caliber of the arterial system thereby allowing easier cannulation.

While IAC offers significant advantages by mitigating the significant systemic complications associated with IVC, it is not that one can do away with IVC, but its role in treating retinoblastoma is getting rather selective. In bilateral disease or in those with suspected trilateral disease, IVC may be preferable, as intravenous administration of the drug will reach all areas of concern. Some authors have used single-agent IVC in infants < 3 months of age with the aim of shifting over to bilateral or tandem IAC subsequently.^[3] IAC of bilateral retinoblastoma can be performed in a single session, by withdrawing the cannula to cannulate the opposite ophthalmic artery, after treatment of one side (tandem therapy). In this series, 89% of children with bilateral disease were treated with bilateral IAC, 56% with tandem IAC. IAC also offers shorter treatment times to achieve ocular survival and better visual outcomes in advanced unilateral retinoblastoma.^[4] Thus, IVC appears to be limited to treating children with trilateral retinoblastoma or as a bridge therapy until IAC can be performed in children with bilateral disease.^[3] The recent reports indicating the safety and efficacy of IAC in infants < 3 months of age further limit the role of IVC to treat trilateral and/or metastatic retinoblastoma.^[5]

Despite the popularity of IAC as the primary choice to treat retinoblastoma in the developed world, IVC is more often the primary choice in the Indian subcontinent. This is not because of the lack of expertise to perform IAC, but due to the significant cost advantage of IVC when compared with IAC in our country. A cycle of IVC may cost around Rs. 5000 in contrast to that of IAC which would cost anywhere between Rs. 50,000 and Rs. 100,000, most of the cost being that of the catheter used for IAC. This stumbling block to the widespread acceptance of IAC can be overcome by indigenous development of the catheter, governmental intervention rationalizing the costs, and by increasing the number of centers performing the treatment. Currently, there are a handful of centers in the country, which perform IAC, and most of these are corporate hospitals with limited leeway to offer subsidized therapy. If nonprofit organizations and government hospitals were to adopt IAC, the costs may come down significantly.

To summarize, IAC is safe and effective in treating unilateral and bilateral retinoblastoma in patients less than 3 months to those older than 5 years. We in India should look to means for effecting this shift at the earliest for the benefit of our patients.

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Access this article online	
Quick Response Code:	Website: www.ijo.in
	DOI: 10.4103/ijo.IJO_1193_19

Cite this article as: Shanmugam PM. Commentary: The shift to intra-arterial chemotherapy – Relevance in Indian context. *Indian J Ophthalmol* 2019;67:2011-2.