Bevacizumab (Avastin®)

Bevacizumab (Avastin®, Genentech, Roche) is a recombinant, humanized, monoclonal immunoglobulin G1 antibody (149 kD) that binds to and inhibits the biologic activity of all isoforms of human VEGF.

This molecule has 2 antigen-binding domains (ranibizumab has 1).

In 2004, the FDA approved bevacizumab for use in patients with metastatic colorectal cancer.

It has received additional approval for use in patients with non–small-cell lung cancer and those with metastatic breast cancer(78-81).

Though not formally studied or approved for any intraocular disease, Rosenfeld's pioneering work and the unavailability of a related ocular drug, ranibizumab, led to rapid and wide use of bevacizumab all over the world(82, 83).

Using bevacizumab as an intravitreal injection to treat neovascular AMD is off-label at this time, however many ophthalmologists, appropriately offer intravitreal bevacizumab to AMD patients based on multiple forms of evidence: results from several retrospective case series, extrapolation from the magnitude of the outcomes reported with ranibizumab, the structural similarity between ranibizumab and bevacizumab, the individual, and the natural history of the disease if left untreated(84).

In the human retina, it is unclear if the molecule of bevacizumab fully distributes within the retinal layers or if localized inhibition of VEGF in the vitreous and inner retina is responsible for the clinical effects associated with administration(85-87).

There are also theories that the larger size of bevacizumab relative to ranibizumab may result in bevacizumab not clearing as quickly from the eye, potentially resulting in longer duration of activity.

To the knowledge of this author, this claim has not been confirmed(84).

Full antibodies generally have longer systemic half-lives than antibody fragments.

Therefore, it is assumed that the half-life of bevacizumab in the eye and in the circulation is longer than that of ranibizumab after intravitreal injection.

Different half-lives for these 2 drugs may have implications for different dosing frequencies and different systemic toxicities(78, 86-91).

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