Letter to the Editor

Intralesional Bevacizumab (Avastin®) as a Novel Addition to Infantile Hemangioma Management: A Medical Hypothesis

Dear Editor,

Infantile hemangiomas (IHs) are benign tumors of the vascular endothelium. There are numerous medications available for the treatment of IH, including wait-and-see policy, laser therapy, systemic and local medications, sclerotherapy, radiotherapy, and surgery. To obtain the best treatment outcomes, the treatment protocol should be individualized and comprehensive as well as sequential.[1,2]

Studies have confirmed the importance of vascular endothelial growth factor (VEGF) pathway in IH and the fact that it is a major stimulus responsible for cell proliferation and angiogenesis.[3]

Some of the medications are developed to directly modulate vascular proliferation. Although data on the efficacy of local pharmacotherapy in IH are limited, the administration of local medication is often preferred.

Intralesional injection of some medications including corticosteroids can be considered as an effective adjuvant treatment for involution phase of IH in patients with poor response to oral drug therapy. The advantages of intralesional injection include short course, reduced financial cost, good tolerance, and minimal major complications.[2]

This may lead to contraindications and development of adverse effects of administrated systemic medications in small or superficial IH.[1,4,5]

Bevacizumab is a recombinant humanized monoclonal antibody that blocks angiogenesis by inhibiting VEGF-A.[6] Originally, Bevacizumab (Avastin®, Genentech Inc., San Francisco, CA, USA) was approved by the US Food and Drug Administration (FDA) for certain metastatic cancers including lung, breast, renal, and brain as a systemic administration.[6]

In addition, the FDA approval of bevacizumab intravitreal injections on vitreous cavities has been performed without significant intraocular toxicity in proliferative diabetic retinopathy (PDR).[7] Intravitreal Avastin® inhibits the locally increased levels of VEGF in the vitreous cavity in patients with PDR and induces a short-term regression of new vessels in vasoproliferative diseases.[8,9]

In addition, the current evidence indicates that injection of intravitreal bevacizumab is an effective for achieving regression of acute retinopathy of prematurity in a newborn with distinct ocular advantages.[10]

Therefore, Avastin® has local anti-VEGF effects.

Jeng *et al*. reported effective treatment of malignant transformation of IH to angiosarcoma with systemic chemotherapy and Avastin®.[11] Avastin® is an anti-angiogenic agent drug capable of suppressing the pro-angiogenic signaling pathway, following activating mutations in the RAS gene. This gain of function mutation promotes angiogenesis. Since this pathway begins extracellularly with VEGF binding its receptor VEGFR, anti-VEGF is used for the treatment of angiosarcoma and Kaposi sarcoma.[11]

Halin *et al.* in 2008 described an experimental model of the topical application of VEGF receptor tyrosine-kinase inhibitors (NVP-BAW2881) in reduced inflammatory responses elicited in pig skin by ultraviolet B irradiation.[12] Their results demonstrate that a decreased local VEGF may be due to the local application of NVP-BAW2881.[12]

Taken together, considering the important role of VEGF involved in the pathophysiology of IH and the anti-angiogenesis effect of Avastin®, we hypothesized that Avastin® is a useful addition to the limited local anti-IH ammunition. This was consistent with the study by Steeples *et al.* in 2013, who described the intralesional application of anti-VEGF in the treatment of palpebral pyogenic granuloma associated with pregnancy in a case report.[13]

The importance of our letter is to introduce a potentially promising medication for a common but sometimes debilitating disease during infancy and can encourage clinical researchers, especially those who have access to this drug, to conduct further trials on this topic.

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Conflicts of interest

There are no conflicts of interest.

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