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Opinion

Choroidal Neovascularisation Treatment (Challenges and Suggestions)

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Aged macular degeneration (AMD) is the leading cause of blindness among the elderly. This disease mainly affects the central part of retina that responsible to straight vision. Therefore, many activities such as reading writing driving will be affected [1]. AMD is composed of two forms, the dry one also called geographic atrophy and the wet form is called choroidal neovascularisation. According to statistics AMD is responsible for 50% of blindness in developed countries and this percentage might jump to 70% in 2030 in the absence of satisfactory medication [2]. Choroidal neovascularisation is more intensive and contribute to 90% of blindness among AMD patients [3].

AMD is a complicated disorder and multifactorial. Moreover, several mechanisms are included in this disorder such as, hypoxia, oxidative stress, inflammation and genetic disorder. However, deep understanding the mechanism of this disease could help in providing satisfactory medication. Several therapeutic approaches are available to treat AMD. Part of them was are no longer used such as laser and photodynamic therapy [3]. These two types of treatment depend on damaging the actively growing blood vessels extended from choroid toward hypoxic retina in an attempt to innervate the retina, these blood vessels are incomplete and constantly leaking followed by damaging the photoreceptors. Using these kinds of treatments leads to create further hypoxia and subsequently, refulling the angiogenesis to the site of injury [4], in addition to the limited improvement noticed with the patients subjected to this kind of treatment. Hence, the use of these kind of treatment are no longer use.

Additionally, significant improvement was noticed following introducing of anti-VEGF therapy to manage choroidal neovascularisation since these types of therapy is more effective since they target VEGF agent which is potentially linked to the angiogenesis process [5]. Anti-VEGF need to be delivered to the posterior segment of eye and this process require intravitreal injection. Intravitreal injection showed the promise to deliver the therapeutic factor to the posterior segment. However, this approach is invasive therapy and accompanied by several adverse effects such as intraocular inflammation and retinal detachment, infectious endophthalmitis, local effects of RPE tear, increase intraocular pressure [6]. Additionally, systemic side effects such as retinal venous/artery occlusion, optic neuropathy, development of ocular ischemic syndrome, sixth nerve palsy and haemorrhagic macular infarction [2].

Several attempts were performed to prepare more convenient therapy via nanotechnology by preparing nanoparticles that can slowly release the drug at the site of injury to reduce the frequency of injections [7]. However, this approach solved the issue partially since intravitreal injection is inevitable. Taking into consideration of the aforementioned challenges regrading AMD treatment, using non-invasive approach possesses anti-inflammatory, anti-oxidant and anti-angiogenic factor are still required.

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