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# Acute Retinal Necrosis – Early Diagnosis is Key to Outcome

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## Abstract

- Acute Retinal Necrosis (ARN) can have extremely devastating effects on the vision of both healthy and immunocompromised individuals. Many times the exact pathogen of ARN can remain a mystery due to its silent and sometimes sudden onset along with the loss of vision prior to vitreal biopsy. One of the known pathogens is the Herpes Zoster Virus (HZV).
- When Herpes Zoster Virus attack the retina, there are very devastating effects due to ARN including long term complications and blindness. A review of literature looked at the retrospective studies related to the incidence and prevalence of ARN caused by HZV. With an incidence of 1 case per 1.6 – 2.0 million population per year (Papageorgiou, Ch'ng, Kulkarni, Anwar, & Empeslidis, 2014), Acute Retinal Necrosis (ARN) can have extremely devastating effects on the vision of both healthy and immunocompromised individuals. A correlation of ARN and HZV might explain the complications and treatments related to herpes zoster of the retina. The results show how multiple healthcare providers can quickly identify and seek specialized treatment to preserve the patient's eye site. These results indicate that there are more detrimental eye related conditions that are associated with herpes zoster virus than previously thought and how seeking coordinated specialized treatment can minimize the long term complications.

## Introduction

- Herpes Zoster Virus (HZV) of the retina is a painless process that can progress very rapidly. HZV attacking the retina leads to Acute Retinal Necrosis (ARN) causing very devastating effects risking both the short term and long term outcomes of a patient's visual acuity.

## Statement of the Problem

- Acute Retinal Necrosis can be a devastating disease that can lead to very dramatic lifestyle changes due to permeant vision deficit and/or loss. The disease can show up suddenly and progress very rapidly as well. Some of its early onset of symptoms could potentially be dismissed to age related visual changes from posterior vitreal detachment, however on fundal exam changes to the retina can be spotted leading the provider to take some prompt action. There is some speculation that some sudden vision loss in the adult population can be associated to ARN in patients that never received eye exams until after the retina had detached completely.

## Research Question

- In adult patients with sudden onset visual disturbances caused by acute viral retinitis, does immediate surgical intervention along with an antiviral agent have a more favorable outcome than antiviral agents alone.

## Literature Review

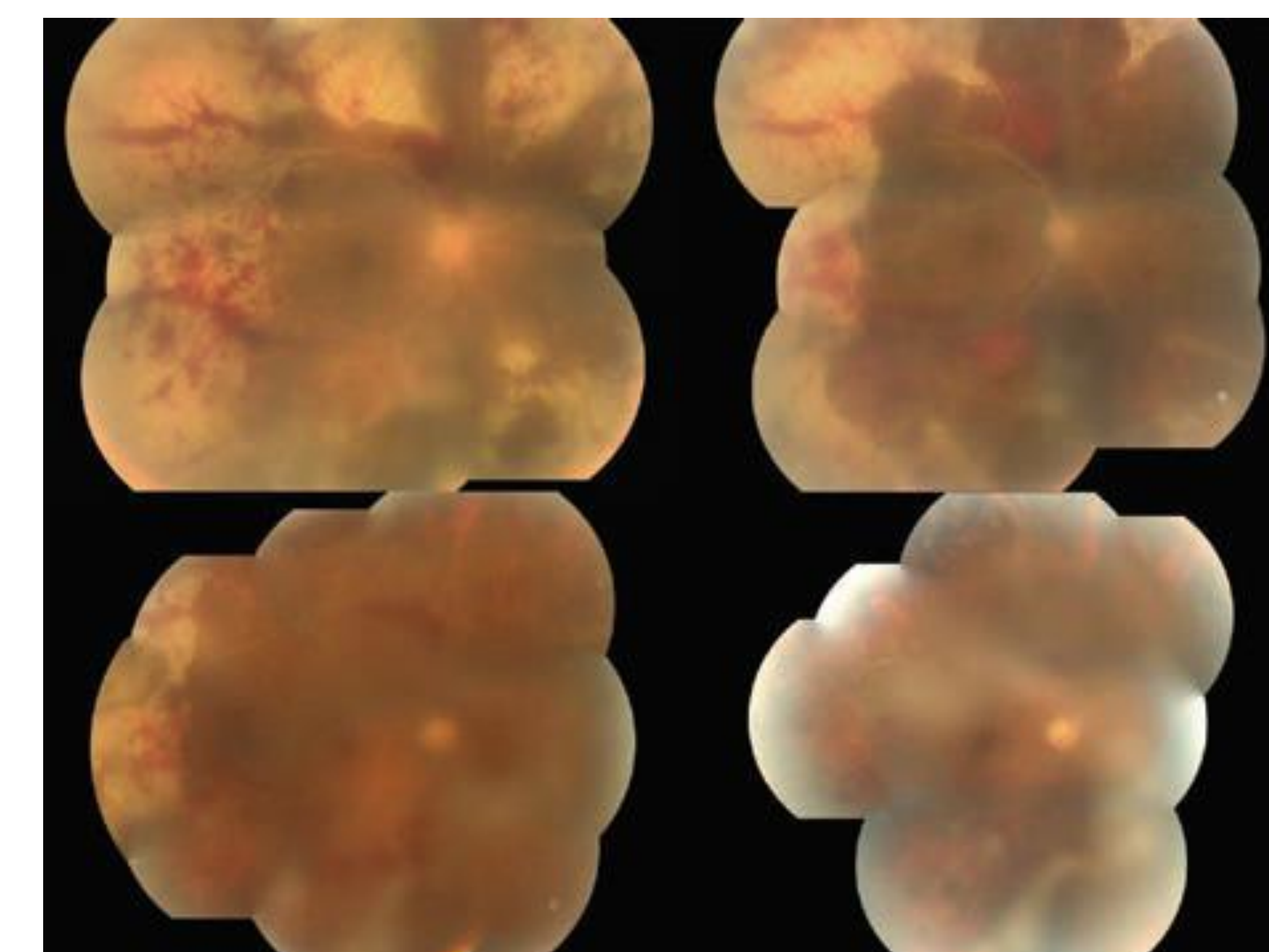
- Reviewing the literature, shows that the earlier the patient is evaluated and the referral to an ophthalmologists that specializes in disorders of the posterior aspect of the eye, the patient will have a more favorable outcome. The longer the patient is delayed in their treatment, the more damage will be done to the retina decreasing the best visual acuity in the long term.
- Cochran et al, 2011, is a 14 month prospective study that was performed by the British Ophthalmological Surveillance Unit in order to find the incidence of ARN. With the 45 patients that were reported, 38 experienced unilateral involvement. 7 had bilateral involvement either simultaneously or experienced second eye involvement within a 3 month period after the initial presentation. The most common causative agent in the ARN was reported to be Varicella Zoster Virus. Other causative agents include CMV, HSV 1 & 2, VZV, toxoplasmosis, Epstein-Barr virus, and Syphilis.
- Testing that can be performed for the confirmation of the virus that is the most common causes for ARN is polymerase chain reaction (PCR) of a small amount of vitreous fluid (Takase et al., 2015) under general anesthesia in a surgical suite.
- However the exact causative agent is not necessary for treatment as the treatments are the same. Virostatic drugs should be started immediately and then corticosteroids should be added no earlier than 24-48 hours after the antiviral medications. (Mach et al., 2012)
- Roy et al., 2014, is a study of that was done retrospectively over a 10 year period with a total of 62 eyes out of 53 patients diagnosed with ARN. The outcomes varied with all of the patients started immediately on antiviral therapy, both oral and intravenous and was followed by a course of oral steroids. The final viral diagnosis was HSV in 19 patients (30.60%) and VZV in 28 (45.16%). There was retinal detachment in 66.12 % (41 eyes). Favorable final outcomes were seen in 28 of the 62 eyes (45.1%). The treatment needs to be quick and aggressive to increase the rates of the favorable outcome of ARN, a fulminate disorder. (Roy et al., 2014).
- The preferred antiviral medication for these injections is Foscarnet since it reaches the target area with the highest concentration. This treatment is one that decreases the progression of the disease damage to the retina as well as decreases the inflammation that occurs in the vitreous humor. (Cochrane et al., 2012)
- When it comes to treatment of ARN, early diagnosis is cornerstone treatment and can lead to the best outcomes. (Pikkel & Pikkel, 2014)

## Discussion

- When a patient is presenting with signs of Acute Retinal Necrosis, there will need to be a rapid treatment course in order to preserve the patient's long term visual outcome.
- The course of this treatment will not be one that will only require a few days of treatment, this will be a treatment course that will require dedication and patience on both the patient as well as the provider as this may last for months to years. Depending on the causative agent, there may be relapses from time to time that will require need for immediate evaluation and possible treatment.
- The vitreous inflammation that occurs in these relapses increases the intraocular pressure causing several other ocular problems. These problems include but not limited to optic nerve damage, posterior subcapsular cataract (PSC) formation, cystoid macular edema (CME), and vasculitis associated macular degeneration



Upper image showing vasculitis and peripheral white patching. Lower Image showing white patches of necrosis in the temporal area.(Pikkel & Pikkel, 2014)



Fundus photos. Upper left – At initial presentation. Upper Right - 1 week post 1st injection. Lower Left – 1 week after 4th injection. Lower Right – 1 month after the 5th injection

## Applicability to Clinical Practice

- How a PCP would initially suspect would be a patient that is seen in the office for visual changes in one or both eyes with or without a minimal amount of pain, anterior uveitis, or a rapid increase in number or the new presence of "floaters" in the eye.
- As a primary care provider, a call to an ophthalmologist needs to be made quickly when there is any suspicion of Acute Retinal Necrosis. This call should include questions in regards to the diagnostic studies that the ophthalmologist would like to have drawn now as well as if there is an antiviral that the ophthalmologist would like started. The ophthalmologist will likely request that a CBC, CMP, and blood cultures be obtained as well as starting the patient on an antiviral medication to help prevent further damage.
- In ophthalmology, the patient will then be evaluated for the severity of the disease and the course of treatment will then be initiated. In the severe cases with the necrosis showing around the entire periphery of the retina, the patient will likely be taken to the OR for vitreal biopsy(ies) and given intravitreal antiviral flushing with a vitrectomy

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