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Bifenthrin exposure as an inciting factor for necrotizing orbital cellulitis

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Orbital cellulitis is a life threatening medical emergency that can occur after a chemical injury. Accurate antibiotherapy in combination with surgical intervention may be the key in preventing mortality and preserving visual acuity. A 57 year old man presented with bilateral eyelid edema following exposure to insecticide spray (Bifenthrin). Initial physical exam showed severe swelling of the left eyelid with moderate ischemia and purulent discharge; extraocular muscle function and visual acuity were normal. Laboratory studies results involve: C-reactive protein (CRP) 109.6, procalcitonin (PCT) 8.69, immature white blood cells 13%, INR 1.5, and sodium 128. Intravenous vancomycin and piperacillin-tazobactam were started. Initial CT-Orbits with contrast showed left sided periorbital cellulitis without definite abscess formation. A culture obtained from eyelid grew beta-hemolytic group A *Streptococcus* (GAS) that was penicillin sensitive. Despite broad-spectrum IV antibiotics the infection continued to spread resulting in left eyelid necrosis, increasing swelling, severe pain on eye movement, and acute decrease in visual acuity. A repeat in CT-orbits with contrast showed extension of inflammatory changes involving the extraconal fat near the superior rectus muscle along the superolateral portion of the orbit suspicious for orbital cellulitis. Surgical debridement was performed and antibiotics were transitioned to IV ampicillin/sulbactam, linezolid, and topical gentamicin. Swelling, pain and visual acuity improved with a rapid decrease in CRP to 19. Orbital cellulitis results from skin and paranasal sinus flora that may spread following skin breakage. This occurs once the infection spreads past the septum into the deep tissues of the eye; orbital fat and/or the extraocular muscles become involved. Most of the cases in the literature present trauma or surgical injury as the cause of interruption. Chemical injury as seen in this report can be an additional cause of interruption. Bifenthrin, which is the active ingredient in common pesticide sprays, is known to cause severe edema and inflammation of the eyelids. This subsequently results in skin breakdown and provides an open door for pathogens to invade. As seen in the reported case; GAS, toxin-producing bacteria that can result in devastating necrosis, is one of the common pathogens isolated from orbital tissue cultures. Beta-lactams may be ineffective due to eagle affect: Bacteria in the non-dividing or stationary phase being immune to cell wall-active antibiotics. On the other hand, linezolid prevents toxin production by inhibiting bacterial protein synthesis at the ribosome resulting in a dramatic clinical effect, as seen in this case.

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