

Risk Factors and Complications of Herpes Zoster

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ABSTRACT

Herpes zoster is a viral infection that is prevalent among 20-30% of people. Though it is unclear, the underlying pathophysiology can be attributed to cellular immunity dysfunction. Potential risk factors may involve routine procedures like biopsies and teeth extraction.

Herpes zoster usually follows a very benign course that is most commonly complicated with post herpetic neuralgia; however, serious systemic complications including heart block and cerebral angiitis are frequently reported in immunocompromised cases.

This article reviews publications on this topic and aims to highlight the potential risk factors and documented complications.

INTRODUCTION

Herpes zoster is a reactivation of varicella-zoster virus, a member of the Herpesviridae that remains dormant within the dorsal root or cerebral nerve ganglion after a primary varicella infection [1-3]. (Herpes) and (Zoster) are Greek words mean Creeping Girdle [4].

This article aims to review publications on herpes zoster, with a special focus on potential risk factors and reported complications.

CLINICAL PRESENTATION

Herpes zoster typically presents as a vesicular eruption preceded by pain, erythema, local edema or abnormal sensation. Pain might be burning, shooting, stapping, itching or aching. It usually follows a ganglion distribution, typically on the thoracic region; however, immunocompromised patients might have disseminated herpes zoster [1, 5-7]. Young patients usually present with an erythematous form, whereas elderly or ill patients present with hemorrhagic or necrotic forms [8].

EPIDEMIOLOGY

Herpes zoster is incident among one million, or 4 per 1000 population, per year in the United States and twenty to thirty percent of people will get herpes zoster in their life [6, 9, 10]. It dominates in old age; and rarely, it reactivates during infancy with primary foetal/early infantile infection or during childhood [11-29]. It is still controversial whether it has a sporadic reactivation or it is a seasonal disease [1, 30].

RISK FACTORS

Exact risk factors of reactivation are not well-known; yet, cellular immunity is thought to have a key role [31]. This role is well illustrated in old age due to normal age-related decline in cellular immunity; Plasmodium/malaria infection due to transient depression of cellular immunity and immune suppression in cases of immune deficiencies, human immunodeficiency infection or HIV disease and immunosuppressants [1, 2, 5, 32-44]. The role of genetics and family history is still controversial [41, 45-47].

Table 1: Potential Risk Factors of Herpes Zoster.

Publication	Potential Risk factors		
(Hamaguchi, 2015) [48] (ÇEVİK, 2013) [49] (Herrero, 2004) [50] (Moquete, 2012) [51] (Eryilmaz, 2008) [52] (Levy, 2002) [53]	Abdominal	Liver transplant	
(Sires, 2008) [54] (Clayton, 2005) [55] (Lee, 2005) [56]		Splenectomy	
(Gatti, 2010) [41] (Cvjetković, 1999) [1]		Abdominoplasty	
(Korber, 2007) [57] (Jarade, 2002) [58]		Routine liver biopsy	
(Su, 2011) [59] (Gatti, 2010) [41] (Simms, 2007) [60] (Godfrey, 2006) [61] (Weiss, 1989) [62] (Ramchandani, 2004) [63] (Su, 1976) [64]		Dermatological	Radiesse injection
			Pulsed-dye laser Post cryosurgery
	Psychological	Stress; psychological stress and hard work	
	Ophthalmic	Cataract operation	
		Laser in situ keratomileusis	
	Others	Hematopoietic stem cell transplantation	
		Mechanical trauma; facial trauma	
		Microvascular decompression	
		Spinal surgery	
		Routine removal of third molars	
		Accidental inoculation	

Risk of rheumatoid and connective tissue diseases is debatable. It is difficult to attribute the risk of reactivation to the disease per se; especially that patients are frequently on immunosuppressant medications. Some publications suggest lack of association between herpes zoster and the disease and/or the medication, whereas other researchers propose a possible relationship [65-72].

Other co-existing diseases are diabetes mellitus, essential hypertension, dyslipidaemia, chronic venous diseases, other skin diseases, and malignancies including breast cancer, lung cancer, prostate cancer, lymphoma, lymphatic leukaemia, multiple myeloma and Hodgkin's disease with bone marrow transplant [5, 11, 73-78].

COMPLICATIONS

Though it usually follows a benign course, herpes zoster is most commonly complicated by post herpetic neuralgia (Table 2). It is proposed that different organopathies are due to either direct infiltration of the virus or indirect hematogenous infection [79].

Table 2: Complications of Herpes Zoster.

Publication	Complications		
(Kalender, 2016) [80] (Ma, 2007) [81]	Cardiac	Heart block	
		Pleuropericarditis	
(Bricout, 2015) [82] (Chen, 2014) [83]	Psychological and functional	Decline in functionality and loss of independence	
		Depression	
(Albietz, 2014) [8] (Khalafallah, 2013) [77] (Liesegang, 2008) [84] (McPherson, 1997) [85] (Krimmer, 1994) [86] (Cvjetković, 1999) [1] (Yeo, 1986) [87]	Ophthalmic	Band keratopathy	
		Herpes zoster ophthalmicus in 10-25%	
		Keratitis, iridocyclitis, secondary glaucoma and loss of sight	
		Acute retinal necrosis	
(Ellis, 2014) [88] (Eskiizmir, 2009) [89] (Sigaloff, 2007) [90] (Kayipmaz, 2013) [2] (Johnson, 2010) [10] (Brunton, 1995) [91] (ÇEVİK, 2013) [49] (Straube, 1996) [79] (Bessho, 2010) [92] (Young-Barbee, 2009) [93] (Braun-Falco, 2009) [94] (Straube, 1996) [79]		Neurological	Encephalitis in 0.1-0.2%
			Post herpetic neuralgia in 20% of patients and in 50% of those older than 60
	Myelitis		
	Brown-Sequard syndrome		
	Meningoencephalitis		
	Cerebral angiitis, meningitis		
(Gondivkar, 2010) [61] (Bökenkamp, 1990) [23] (Yeo, 1986) [87] (Jeevarethinam, 2009) [95] (Cvjetković, 1999) [1] (Flamholz, 1996) [96] (Braverman, 1986) [97]	Motor	Facial nerve palsy	
		Unilateral brachial plexitis	
		Guillain-Barre syndrome	
		Focal muscle paralysis and contralateral hemiplegia	
		Focal limb muscle weakness	
		Secondary bacterial infection	
(Cvjetković, 1999) [1] (Leung, 1986) [98]	Dermatological	Scarring	
(Spiess, 1986) [99]		Obstetric	Abortion, embryopathies and organic lesions

(Ellis, 2014) [88] (Nair, 2014) [100]	Others	Disseminated zoster particularly in immunocompromised patients. It is defined as having greater than twenty vesicles outside the primary or adjacent dermatome or as involvement of three or more dermatomes.
(Ling, 2014) [101]		Hepatitis, viral pneumonia and neurogenic chronic cough
(Rudd, 2014) [102]		Osteonecrosis
(AlSardar, 2013) [103]		Cystitis and penile numbness
(Mahima, 2010) [104]		Alveolar bone necrosis and exfoliation of teeth
(Biddlestone, 2009) [105]		Acute urinary retention complicated by constipation
(Paudyal, 2006) [106]		Diaphragmatic motor weakness
(Tola-Arribas, 1997) [107]		Horner's syndrome
(Straube, 1996) [79]		Myositis

DIFFERENTIAL DIAGNOSIS

Herpes zoster can be confused with similar skin lesions; varicella, erysipelas, impetigo, enteroviral infections, and herpes simplex infections. These diseases are excluded by detailed history-taking and physical examination, laboratory findings, virus isolation and commercially available serological tests. Other differentials are odontalgia, sciatica, and lateral pontomedullary syndrome [1, 108-110].

MANAGEMENT

Herpes zoster per sae is a benign disease in the majority of cases. The main aim of management is to control pain, to prevent new eruptions, to reduce duration and complications and to prevent dissemination [111]. It is commonly managed with anti-viral medication (acyclovir or famciclovir), preferably within 72 hours of rash eruption. Different types of pain associated with herpes should not be confused. Acute herpetic pain is managed with antivirals, non-steroidal anti-inflammatories, opioids and sympathetic nerve blockade. This is different to post herpetic neuralgia, a neuropathic pain commonly treated with antidepressants (amitriptyline, nortriptyline or desipramine), anticonvulsants (pregabalin or gabapentin) or antiarrhythmic medications [112]. Antibiotics and corticosteroids can be used when required. Rehabilitation program and resting splints are of benefit if needed [1, 2, 6, 7, 92, 99, 113, 114].

On the other hands, surgical nerve decompression, which

needs extensive research, was implied by some researchers [115].

CONCLUSION

Though it is thought to result from cellular immunity decline, herpes zoster was reported following routine procedures. It is classically a benign disease, where post herpetic neuralgia is the most common complication. Yet, physicians should suspect systemic complications in immunocompromised patients.

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