

# NERVES INVOLVEMENT IN HERPES ZOSTER

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## Abstract

After infection, VZV (Varicella zoster virus) live in sensory ganglia under latent form. When reactivation occurs in those ganglia, virus multiplies and spread antidromically down the sensory nerve to the skin/mucosa where it causes skin lesions. Based on distribution of skin lesions, we can determine the nervitis. **Objective:** To identify the involved nerves in Herpes zoster. **Material and method:** A cross-sectional descriptive study on 91 patients. **Results:** distributed nerves in left side 52.7%, right side: 47.3%. One involved nerve: 51.7%; 2 nerves: 29.6%; 3 nerves: 6.6%; 4 nerves: 5.5%; 5 nerves: 4.4%; 6 nerves: 2.2%. Site of predictions with C: 28.1%; T: 24.6%, L: 21.1%; V: 16.9%; S: 7.6%. The most involved nerves were V1: 13.2%; V2: 12.1%; C3: 12.1%.

**Key words:** Herpes Zoster; Nerve.

## 1. BACKGROUND

Herpes zoster (or shingles) is an infectious disease caused by Varicella zoster virus (VZV). After causing chickenpox, VZV will live in the sensory nerve ganglia as a latent form. When the body immune system weakens, the virus will follow the nerve to the skin, causing neuritis and skin lesions [1, 2, 6]. Based on the distribution characteristics of skin lesions and the pain characteristics, we can determine which were involved [6].

The aim of this study was to identify nerves innovement in Herpes zoster.

## 2. SUBJECTS AND METHODS

### 2.1. Subjects

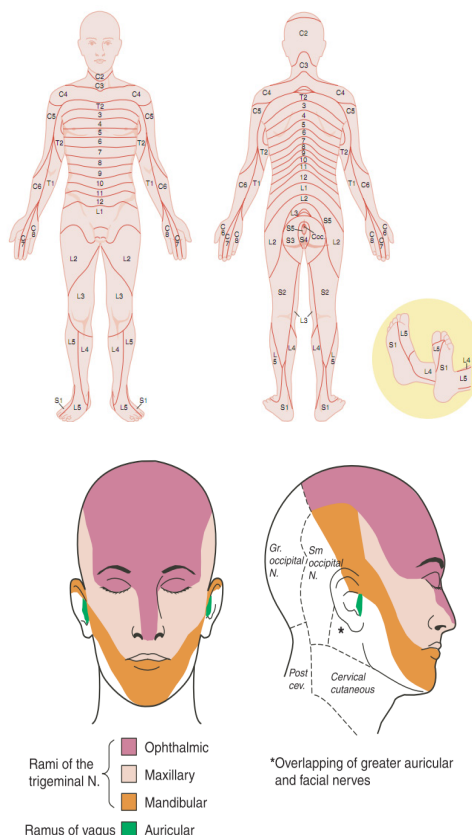
Patients visiting Dermatology department – Hue Central Hospital and Dermatology clinic – Hue University Hospital, diagnosed of Herpes zoster.

Herpes zoster diagnosis criteria [2, 5, 8]:

- Pain at the skin lesions, spreading along sensory nerves, intermittent, sometimes constant nature.

- Lesions: vesicles on erythema, then macules, erosions...Distributed along sensory nerves, one side of the body, sometimes manifested as disseminated form.

The cutaneous fields of peripheral nerves (Klaus W., Richard A.J, *Fitzpatrick's color atlas and synopsis of clinical dermatology* (2008), p.842



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2.2. Methods

- Study Design: descriptive cross-sectional study
- Sample size: convenient sample, n=91
- Study sites: Department of Dermatology -Hue

Central Hospital and Dermatology Clinic - Hue  
University Hospital  
- Time: from March 2014 to September 2014.

3. RESULTS

3.1. Distribution of involved nerves

Table 3.1. Distribution of involved nerves

Distribution	n(%)	p
Left side	48/91 (52.7%)	> 0.05
Right side	43/91 (47.3%)	

Comments: No difference in the distribution of involved nerves on the left or right side of the body

3.2. Number of involved nerves

Table 3.2. Number of involved nerves

Number of Nerves	1	2	3	4	5	6	
n	47	27	6	5	4	2	91
%	51.7	29.6	6.6	5.5	4.4	2.2	100%
Frequency	47	54	18	20	20	12	171

Comments:

- One involved nerve was accounted for the highest proportion (51.7%), there was a declining rate of involved nerves, and the lowest proportion was 6 nerves involved at the same time (2.2%).
- The total was 171 nerve roots.

3.3. Location of involved nerve roots

Table 3.3. Location of involved nerves root

	C	T	L	V	S	
Frequency	48	42	36	29	13	171
Percentage	28.1	24.6	21.1	16.9	7.6	100%

Notes: V (trigeminal), C (Cervical), T (Thoracic), L (Lumbar), S (sacral)

Comments: The most common region of involved nerve roots was cervical region (28.1%), then the thoracic region (24.6%), cervical region (21.1%), trigeminal nerve (16.9%) and the sacral region (7.6%).

3.4. Most common involved nerves

Table 3.4. Most common involved nerve roots

Nerves root	n (%)	Nerves root	n (%)
V1	12 (13.2%)	C4	8 (8.8%)
V2	11 (12.1%)	C5	8 (8.8%)
C3	11 (12.1%)	L2	8 (8.8%)
L3	10 (10.9%)	V3	6 (6.6%)
C6	9 (9.9%)	T6	6 (6.6%)
C2	8 (8.8%)	L4	6 (6.6%)

Comments: The most common involved nerve root was V1(13.2%), V2 and V3 were accounted for the same proportion(12.1%), then L3, C6.

#### 4. DISCUSSION

In our study, according to table 3.1, nerves on the left side of the body (52.7%) were affected more frequent than on the right side (47.3%), but the difference was not statistically significant ( $p>0.05$ ). After VZV infection, virus will come to the sensory nerve ganglia randomly (on the left or right side of the body) and live there as a latent form (inactive); perhaps this randomness in the ganglia explains for the distribution of involved nerves on the left and right side of our body with no difference.

Sensory nerve ganglia are the intersection of sensory nerve fibers, later when the virus reactivated, the virus will travel along the sensory nerve to the skin, one or multiple nerves [2,6]. Thus, according to table 3.2, there was one or multiple involved nerves, but the highest proportion was one nerve (51.7%), the proportion decreased with the number of involved nerves and the highest number of involved nerves was 6, occupied the lowest proportion (2.2%). Total occurrences were 171 on 91 patients, with a medium of 1.9 per person.

Table 3.3 shows the most common location of involved nerve roots was cervical region with 28.1%, then thoracic region: 24.6%, lumbar region: 21.1%, trigeminal nerve: 16.9% and sacral regions 7.6%. According to Klaus W., Richard A.J, the most common regions of involved nerve roots is thoracic regions (>50%), trigeminal nerve (10 – 20%), cervical, lumbar, sacral regions (10 – 20%) [5,6].

So in our study, the proportion of thoracic nerve roots injury was much lower, the proportions of trigeminal and sacral nerve roots were similar, but the proportions of cervical and lumbar nerve roots were higher than the above authors.

According to table 3.4, the most common affected nerve root was V1 (13.2%), then V2 and C3 (12.1%), then L3 (10.9%). Therefore, the nerve roots in the head, face, neck regions (V1, V2, C3) occupied the highest proportion. In Herpes zoster, the most remarkable symptom affecting the patients' quality of life is pain, the virus will cause neuritis, pain in people over 50 years old will be more severe and prolonged [4, 7]; among the most severe pain location include head, face, neck regions which are close to the CNS is accounted for the highest proportion. As a result, those nerves also make up the highest proportions in our study.

#### 5. CONCLUSIONS

- Distribution of involved nerves on the left side was 52.7%, the right side was 47.3%.

- 1 involved nerve is accounted for 51.7%, 2 involved nerves is 29.6%, 3 involved nerves was 6.6%, 4 involved nerves was 5.5% and 6 involved nerves was 2.2%.

- The regions of involved nerve roots: Cervical region: 28.1%, Thoracic region: 24.6%, Lumbar region: 21.1%; Trigeminal nerve: 16.9%; Sacral region: 7.6%.

- The frequent nerve roots: V1: 13.2%; V2: 12.1%; C3: 12.1%.

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