STUDY THE INVOLVED DERMATOMES IN HERPES ZOSTER

Mai Ba Hoang Anh[1], Tran Ngoc Khanh Nam[1], Nguyen Dinh Toan[2],
Le Viet Khanh[3], Duong Huu Thanh[3], Dao Minh Ngoc[3], Nguyen Thi Huyen Van[3]

ABSTRACT

After having varicella, VZV (Varicella zoster virus) live in sensory ganglia under latent infection. Reactivation occurs in those ganglia, virus multiplies and spread antidromically down the sensory nerve to the skin/mucosa where it produces the skin lesions. Base on the distribution of skin lesion, we can know the nervitis.

***Objective**: To investigate the nervitis in Herpes Zoster.*

***Material and method**: Cross-sectional descriptive study on 91 patients.*

***Results**: Distributed dermatome with left 52.7%, right: 47.3%. One inflammatory nerve with: 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 are V1: 13.2%; V2: 12.1%; C3: 12.1%.*

***Key words:** Herpes Zoster, Dermatome*

I. 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 latent form, some time later, 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 the skin lesions and the pain characteristics, we will know which dermatomes were involved [6]. So we conducted this study: "*Study the involved* dermatomes *in Herpes zoster*".

II. SUBJECTS AND METHODS

2.1. Subjects

Patients visiting Dermatology clinic, Dermatology department – Hue Central Hospital and Dermatology clinic – Hue University Hospital, diagnosed with Herpes zoster, accepting to participate in the study.

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

- Pain in the lesions, spreading along sensory nerves, intermittent, sometimes constant nature.
- Lesions: vesicles on erythema, then macule, erosion...Distributed along sensory nerves, one side of the body, sometimes manifested as disseminated form.

How to identify the involved dermatomes: based on the distribution of the skin lesions and the radiation of the pain.

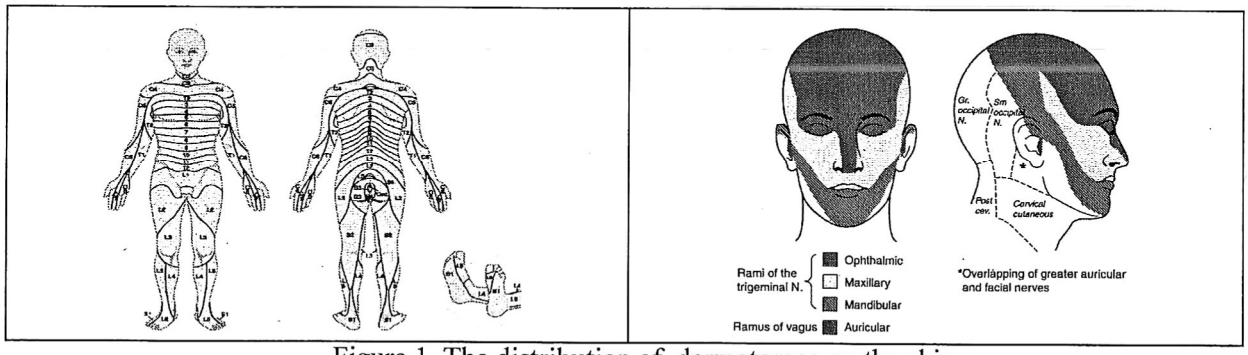

Figure 1. The distribution of dermatomes on the skin

Source: Klaus W., Richard A.J, *Fitzpatrick's color atlas and synopsis of clinical dermatology (2008)*, pp.842

1. Department of Dermatology - Hue University of Medicine and Pharmacy
2. Department of Internal Medicine- Hue University of Medicine and Pharmacy
3. Department of Dermatology – Hue Central Hospital

Corresponding author: Mai Ba Hoang Anh
Email: anhsumb@yahoo.com
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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

Data processing: Biostatistics methods.

III. RESULTS

3.1. Distribution of involved dermatomes

Table 3.1. Distribution of involved dermatomes

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

*Comments:*No difference in the distribution of involveddermatomes on the left or right side of the body.

3.2. Number of involved dermatomes

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Dermatomes	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

Comments: 1 involved dermatomes accounted for the highest proportion (51.7%), there is a declining rate of involveddermatomes, and the lowest proportion was 6 dermatomes involved at the same time (2.2%)

The total is 171 dermatomes

3.3. Location of involved dermatomes

Table 3.3. Location of involved dermatomes

	C	T	L	V	S	
n	48	42	36	29	13	171
%	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 dermatomes is cervical region which accounted for 28.1%, then the thoracic regions (24.6%), cervical regions (21.1%), trigeminal nerve (16.9%), and then the sacral regions (7.6%).

3.4. Most common involved dermatomes

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dermatomes	n(%)	Dermatomes	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.%)	T6	6 (6.6%)
C2	8 (8.8%)	L4	6 (6.6%)

Comments: The most common involveddermatomes is V1, which is accounted for 13.2%, V2 and V3 accounted for the same proportion which is 12.1%, then L3, C6...

IV. DISCUSSION

In our study, according to Table 3.1, dermatomes on the left side of the body (52.7%) were involved 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 latent form (inactive); perhaps this randomness in the ganglia explains for the random distribution of involved dermatomes on the left and right side of our body. Sensory nerve ganglia is the intersection of sensory nerve fibers, later when the virus reactivated, the virus travels along the sensory nerves to the skin, one or multiple nerves [2], [6]. So in our study, according to the table 3.2, there is one or multiple involved dermatomes, but the highest proportion is one dermatomes, which accounted for 51.7%, the proportion decreases with the number of involved dermatomes and the highest number of involveddermatomes is 6, accounted for the lowest proportion, which is 2.2%. Total occurrences was 171 on 91 patients, with a medium of 1.9 per person.

According to table 3.3, the most common location of involved dermatomes are cervical region which is accounted for 28.1%, then thoracic region: 24.6%, lumbar region: 21.1%, trigeminal nerve: 16.9%, sacral regions 7.6%. According to Klaus W., Richard A.J, the most common regions ofinvolveddermatomes are thoracic regions (>50%), trigeminal nerve (10 – 20%), cervical, lumbar, sacral regions (10 – 20%) [5], [6]. So in our study, the proportion of thoracic dermatomes injury is much lower, the proportion of trigeminal and sacral dermatomes is similar, but the proportion of cervical and lumbar dermatomes is higher than the above authors.

According to table 3.4, the most common involved dermatome is V1, which is accounted for 13.2%, then V2 and C3; both of which accounted for 12.1%, then L3, which is accounted for 10.9%...So, the dermatomes in the head, face, neck region(V1, V2, C3) accounted for the highest proportion. In Herpes zoster, the most remarkable symptom affecting the patients' quality of life is pain, as the virus will cause neuritis, pain in people over 50 will be more severe and prolonged [4], [7]; among the most severe pain location, the head, face, neck regions which is close to the CNS is accounted for the highest proportion, so those dermatomes is accounted for the highest proportions in our study.

V. CONCLUSIONS

- Distribution of involved dermatomes on the left side is 52.7%, on the right side is 47.3%.
- Involved dermatome is accounted for 51.7%, 2 involved dermatomes is 29.6%, 3 involved dermatomes is 6.6%, 4 involved dermatomes is 5.5%, 6 involved dermatomes is 2.2%.
- The regions ofinvolved dermatomes: Cervical regions: 28.1%, Thoracic regions: 24.6%, Lumbar regions: 21.1%; Trigeminal nerves: 16.9%; Sacral regions: 7.6%.
- The most frequent involved dermatomes: V1: 13,2%; V2: 12,1%; C3: 12,1%

REFERENCES

1. Nguyen Tu De (2012), "Zona", Post-graduated Dermato-Venereology Book-, publishing house of people's army, pp.193-195.
2. Nguyen Thi Thoi Loan (2012), "Herpes Zoster", Vietnamese Journal of Dermatology, (09), pp.53-61.
3. Bell Beya Gwet (2009), "Dermatologie", pp.66-69.
4. Gnann JW Jr, Whitley RJ (2002), Herpes zoster, N Engl J Med, pp.347-340.
5. Klaus W., Lowell A. et al (2008),"Fitzpatrick's Color Atlas and Synopsis of Clinical Dermatology", pp.1885-1898.
6. Klaus W., Richard A.J. (2008), "Color Atlas and Synopsis of Clinical Dermatology", pp.831-845
7. Stephane B., Beatrice C. (2013), " Dematologie et infections sexuellement transmissibles", pp.339-344.
8. Thomas P.H., James L.C et al (2010), "Maladie cutanees: diagnostic et traitement", pp.206-211.