

Hyperglycemia as a Predictor for Post-herpetic Neuralgia in Patients with Herpes Zoster

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Abstract: Herpes zoster may be attended by a variety of neurologic complications of which post herpetic neuralgia (PHN) is the most common and important. This study aimed to determine the correlation between PHN and diabetes mellitus indicated by hyperglycemia. A prospective hospital-based cross-sectional study was carried out to determine the correlation between PHN and diabetes mellitus as indicated by hyperglycemia. There was a high significant correlation between age and postherpetic neuralgia (Pearson Chi square value was 18.60, $p < 0.001$). Pearson correlation between random blood sugar and age was significant at the level 0.05 (Pearson correlation = 0.333, $p = 0.016$). Moreover, a significant correlation was found between DM and PHN (Pearson Chi square value was 6.28, $p < 0.029$). In conclusion, Diabetes mellitus, as indicated by hyperglycemia, may be considered as a predictor for PHN especially in old patients with herpes zoster.

Keywords: Herpes zoster (HZ), Varicella-zoster virus (VZV), Diabetes mellitus, Post-herpetic neuralgia (PHN).

INTRODUCTION

Varicella-zoster virus (VZV), a neurotropic herpesvirus, is the causative agent of both varicella (chickenpox) and zoster (shingles). It is a human herpesvirus that infects 98% of adult populations. Primary VZV infection (varicella or chickenpox) is nearly always symptomatic and characterized by disseminated pruritic vesicles. During primary infection, VZV establishes lifelong infection in sensory ganglia. When immunity to VZV declines, VZV reactivates within the nerve cell, traveling down the neuron to the skin, where it erupts in a dermatomal pattern-the so called herpes zoster (HZ), or shingles [1,2].

Herpes zoster may be attended by a variety of neurologic complications of which post herpetic neuralgia (PHN) is the most common and important. PHN has been variably defined as any pain 1 month, 3 months, 4 months, or 6 months after rash onset, with most recent definitions focusing on 90 to 120 days after rash onset (Fitzpatrick). Others define PHN as pain persisting beyond a specified interval after rash healing [3, 4].

In humans, PHN pain occurs after a reactivated infection, after latency period, that causes great damage to sensory neuron cell bodies in the ganglion and to their axons [5].

Herpes zoster and postherpetic neuralgia will remain important clinical problems for the foreseeable future. PHN can be debilitating, exacerbated by the

slightest touch, and lead to loss of employment, depression, and social isolation [6].

Although high incidences of diabetes was found to be associated with herpes zoster infection [7], No obvious correlation between PHN and diabetes indicated by hyperglycemia at the onset of herpes zoster.

This study aimed to determine the correlation between PHN and diabetes mellitus indicated by hyperglycemia.

PATIENTS AND METHODS

Study design

This study was prospective descriptive hospital - based cross-sectional study.

Study area

The study was conducted in Khartoum Dermatology and Venerology Diseases Teaching Hospital and was carried out in a period from July 2011 to August 2012. Data were collected from 52 patients using previously designed and pre-coded questionnaire after taking consent and assuring them that all their obtained information will be handled in a confidential atmosphere and it will not affect their life.

Preliminary information such as age, sex, address, and occupation were noted. A detailed history regarding the prodromal and presenting symptoms, day of occurrence of skin lesions after prodrome, nature of pain, its intensity and duration, and other symptoms if any, were elicited and recorded.

At first reporting, random blood sugar was conducted. All the patients were treated according to the time of visit after appearance of skin lesions

Statistical analysis

Statistical analysis was performed using Statistical Package for Social Science (SPSS). A descriptive analysis was done for all questionnaire parameters. Cross tabulation between data of PHN incidence and diabetes mellitus indicated by high random blood glucose levels and significance was estimated at terms of Pearson Chi square test.

RESULTS

Four out of seven diabetic patients with herpes zoster showed PHN (Table 1 and figure 1). There was a high significant correlation between age and postherpetic neuralgia, PHN, (Pearson Chi square value was 18.60, $p < 0.001$). Pearson correlation between random blood sugar and age was significant at the level 0.05 (Pearson correlation = 0.333, two-tailed significance was 0.016).

Moreover, a significant correlation was found between DM and PHN (Pearson Chi square value was 6.28, $p < 0.029$).

Table 1: Results of the study

| Patients (n=52) | Number | Frequency of PHN | % of PHN | Age (year) ± S.D. | 95 % CI | RBS (mg/dl) ± S.D. |
|-----------------|--------|------------------|----------|-------------------|---------------|--------------------|
| Diabetic | 7 | 4 | 57.14% | 53.86** ± 9.56 | 45.01 – 62.70 | 211.29** ± 77.76 |
| Non-diabetic | 45 | 7 | 15.55% | 38.60 ± 11.74 | 35.07 – 42.12 | 103.96 ± 14.86 |

CI: 95% Confidence interval of the difference between age extremities, ** $p < 0.001$

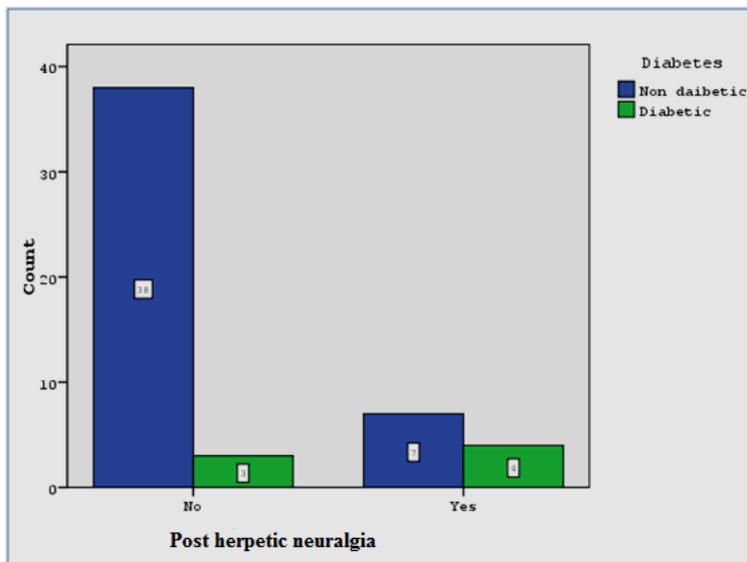


Fig. 1: Frequency of PHN in diabetic and non-diabetic patients with herpes zoster

DISCUSSION

The normal age-related decrease in cell-mediated immunity is thought to account for the increased incidence of varicella-zoster virus reactivation. Patients with disease states that affect cell-mediated immunity are also at increased risk [8].

Although the burden of neuropathic pain of PHN and the risk factors which increase its incidence are well-recognized, data are scarce about the correlation between diabetes and PHN.

The significant correlation between diabetes mellitus (DM) indicated by hyperglycemia and PHN, make DM

to be significant predictor for PHN especially in elders. This finding is consistent with other few previous studies and reviews [3, 9].

CONCLUSION

Significant correlation of PHN with diabetes mellitus, make diabetes mellitus, as indicated by hyperglycemia, to be a predictor for PHN especially in old patients with herpes zoster.

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