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HERPES ZOSTER, SHINGLES – A CLINICOEPIDEMIOLOGICAL STUDY AND ITS COMPLICATIONS AMONG IMMUNOCOMPETENT AND IMMUNOCOMPROMISED PATIENTS

Dermatology

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ABSTRACT

INTRODUCTION: Shingles is a localised distribution, affects individual nerve and its particular dermatome; develops in persons who have been exposed to chicken pox in the past. Various therapeutic modalities are available for this, but only few of them are effective. The present study is aim is to know the clinicoepidemiological study and complications of shingles.

MATERIALS AND METHODS: Patient details, dermatological lesions presentation, systemic examination findings were all collected in a pre-structured proforma. Patients were advised to undergo routine blood and urine examination, random blood sugar, HIV and specific investigations if required. Patients were followed up every week and observed for complications.

RESULTS: Out of 116, 94 (81.08%) were immunocompetent and 22 (18.9%) immunocompromised patients. Out of 116 cases, 44 (37.9%) were males and remaining 72 (62.06%) were females. Most common clinical presentation was dermatological pain (74.1%) followed by burning sensation (68.9%), rash (45.6%). Post Herpetic Neuralgia (28.4%) is the most common complication observed followed by Sensory loss (24.1%), Ocular complications (19.8%) and secondary infection.

CONCLUSION: Complications were observed most commonly among Immunocompromised patients, so clinician should treat these patients promptly like treatment of HZV infection and its associated pain, post herpetic neuralgia prevention, supporting treatment until neurological pain resolves .

KEYWORDS

Shingles, Immunocompromised, Immunocompetent Persons.

INTRODUCTION

Herpes Zoster is cause by the varicella zoster virus (HHV-3). Varicella zoster virus is responsible for chicken pox & shingles. Chicken pox is a generalised disease, usually presents in children. Shingles is a localised distribution, affects individual nerve and its particular dermatome; develops in persons who have been exposed to chicken pox in the past.

Herpes Zoster persons can transmit virus to their seronegative contacts, which may develop varicella, but not HZ. [1]

Globally, the estimated average overall incidence of Herpes Zoster is about 3.4 – 4.82 per 1000 person years which increases to more than 11 per 1000 person years in those aged at least 80 years [2]. Mortality rate is less with HZ, with incidence about 0 – 0.47 per 100000 person year and the majority of deaths occur in those aged at least 60 years [3].

Complications of HZ occur due to involvement of ophthalmic splachnic, cerebral and motor nerves. Complications are cutaneous - secondary infection, scarring, zoster gangrenosum, cutaneous dissemination, neurological - post herpetic neuralgia, meningoencephalitis, transverse myelitis, cranial nerve palsies, peripheral nerve palsies, sensory loss, hearing loss, ocular complications, Granulomatous angitis, visceral – gastritis, pneumonitis, hepatitis, pericarditis, cystitis, esophagitis. PHN is the most common complication [4].

Various therapeutic modalities are available, but only few of them are effective. However, these effective therapies can only reduce symptoms and chronic sequale. This is the reason many of the therapeutic approaches has been proposing over the years [5].

MATERIALS AND METHODS

STUDY DESIGN:
Prospective observational

STUDY PERIOD:
October 2018 to August 2019

STUDY POPULATION:
116 cases with Herpes Zoster lesions presented to dermatology OPD.

INCLUSION CRITERIA:
all ages of both sexes Both Immunocompetent and Immuno compromised patients Herpes Zoster with < 6 weeks of duration.

EXCLUSION CRITERIA:
Herpes Zoster with >6 weeks of duration.

Informed consent has been taken from all the patients included in this study.

Patient details pertaining to age, sex, occupation, dietary habits, life style, personal habits, past history of chicken pox, clinical findings including symptoms & signs, dermatological lesions presentation, systemic examination findings were all collected in a pre-structured proforma.

Patients were advised to undergo routine blood and urine examination, random blood sugar, HIV and specific investigations if required. Patients were followed up every week and observed for complications. All these data were entered into excel sheet. Results were tabulated and analysed. Statistical analysis was assessed by social science statistics software and the p value < 0.05 is considered as statistically significant.

RESULTS

A total of 116 Herpes Zoster cases were included in this study. Out of 116, 94 (81.08%) were immunocompetent and 22 (18.9%) immunocompromised patients. Majority of the patients were observed in the age group of 51-60 years (30.1%), followed by 41-50 years (25.5%) and 31-40 years (14.6%). 29.6% (8 out of 27) patients were immunocompromised among herpes zoster patients aged between 51-60 years. Whereas, among patients aged 41-50 years was 26.08% (6 out of 23) were immunocompromised. Young patient observed in the study was 8 years old.

Table 1. Age distribution of Shingles infection

Age in years	Immunocompetent patients	Immunocompromised patients	Total	Percentage
1-10	1	0	1	0.8%
11-20	5	1	6	5.1%
21-30	7	1	8	6.8%
31-40	14	3	17	14.6%
41-50	23	6	29	25.5%
51-60	27	8	35	30.1%
61-70	12	2	14	12.6%
71-80	5	1	6	5.1%
81-90	0	0	0	0%
91-100	0	0	0	0%
Total	94	22	116	100%

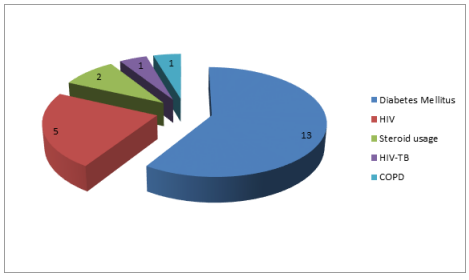
Out of 116 cases, 44 (37.9%) were males and remaining 72 (62.06%) were females. Most common clinical presentation was dermatological pain (74.1%) followed by burning sensation (68.9%), rash (45.6%) (Table 2).

Table 2. Prevalence of various clinical features among shingles patients

Clinical presentation	Number of patients	Percentage
Dermatomal pain	86	74.1%
Burning sensation	80	68.9%
Fever	15	12.9%
Paraesthesia	9	7.7%
Skin lesions/Rash	53	45.6%
Itching	12	10.3%
Ear pain	4	3.4%

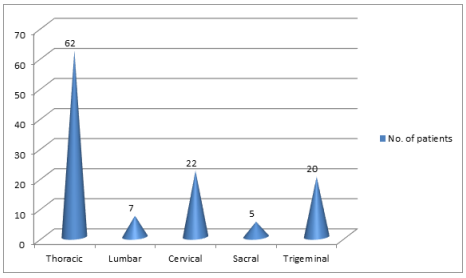
Among 22 Immunocompromised patients group, 13 (59.1%) had diabetes mellitus, 5 (22.7%) had HIV, 2 (9.09%) patients were under steroid therapy, 1 (4.5%) patient had HIV- tuberculosis coinfection and 1 (4.5%) patient had COPD.

Fig 1. Comorbidities and Shingles



Majority of the patients were presented between 2nd and 5th day of prodromal symptoms. 53.4% presented with thoracic distribution of Herpes Zoster, 18.9% of cervical, 17.2% of trigeminal, 6.03% of lumbar and 4.3% of sacral distribution.

Fig 2. Dermatomal distribution of shingles



Post Herpetic Neuralgia (28.4%) is the most common complication observed followed by Sensory loss (24.1%), Ocular complications (19.8%) and secondary infection (18.9%).Immuocompromised patients were predominantly reported with Herpes Zoster complications when compared to Immunocompetent patients. Complications was significantly higher in Immunocompromised patients than Immunocompetent patients ($p<0.05$).

Table 3. Complications among Immunocompetent and Immunocompromised patients

	Immunocompetent		Immunocompromised		Total	Percentage	Chi square with Yates correction	P value
	No. of patients	%	No. of patients	%				
PHN	12	36.3	21	63.6	33	28.4	55.89	<0.05
Secondary Infection	10	45.4	12	54.5	22	18.9	19.59	<0.05
Scarring	7	41.1	10	58.8	17	14.6	17.6	<0.05
Ocular complications	8	34.7	15	65.2	23	19.8	36.2	<0.05
Hearing loss	6	42.8	8	57.14	14	12.06	12.4	<0.05
Sensory loss	10	35.7	18	64.28	28	24.1	45.5	<0.05
Pneumonia	2	25	6	75	8	6.8	13.8	<0.05

DISCUSSION

Shingles develop due to VZV, which lays dormant in dorsal root ganglia for years after exposure [6]. Most adults with the dormant virus never experience an outbreak of shingles. However, in some individuals, it may reactivate multiple times.

Virus remains dormant in sensory dorsal root ganglia after primary infection. This virus reactivates once virus specific CMI decreases. It is unclear about whether virus resides in neurons and supporting cells. VZV genome has been identified in trigeminal ganglia of nearly all seropositive patients [7].

The pathophysiology of post herpetic neuralgia is not clearly defined. Reactivated virus travels down the sensory nerve and is the cause for the dermatomal distribution of pain and skin lesions. VZV cause damage to the sensory nerves, the sensory dorsal root ganglia and the dorsal horns of the spinal cord in patients with this condition [8].

Out of 116, 94 (81.08%) were immunocompetent and 22 (18.9%) immunocompromised patients. Majority of the patients were observed in the age group of 51-60 years (30.1%), followed by 41-50 years (25.5%) and 31-40 years (14.6%). 29.6% (8 out of 27) patients were immunocompromised among herpes zoster patients aged between 51-60 years. Whereas, among patients aged 41-50 years was 26.08% (6 out of 23) were immunocompromised. Young patient observed in the study was 8 years old as per our study.

Pergram SA stated that incidence of Herpes zoster among people who are immunocompromised is much higher than in the general patients, with incidence rates ranging from 14.5 to 53.6 per 1000 person – years [9].

Yawn BP et al did a retrospective study in Minnesota on 1530 immunocompetent individuals with Herpes zoster; observed a 5.7% recurrence rate in subsequent 8 years. [10].

Buchbinder SP et al documented as patients with HIV have upto 10 times the risk of developing zoster compared to general patients [11]. In similar to our study, Toyama and Shiraki [12] study reported higher rate of occurrence in individuals aged 50-70 years. Donahue JG et al [13] accounted >30% of Herpes Zoster cases among patients >55 years of age. Whereas, children less than 14 years old; represented only 5% of HZ cases.

Kim YJ et al [14] conducted a study in Korea, observed an incidence of Herpes Zoster 21.8/1000 person years among 70-79 age group and 2.0/1000 person years among childhood group.

Di Legami V et al [15] reported incidence of Herpes Zoster among patients aged >72 years as 0.46/1000 person years and patients aged 15-44 years as 0.03/1000 person years.

The reason behind increasing prevalence of HZ with advancing age is thought to be decrease in CMI as age advances. Even in patients with disease that affect CMI, such as HIV, malignancies and patients on usage of corticosteroid, chemotherapy, radiotherapy are at increased risk of developing HZ [16].

Out of 116 cases, 44 (37.9%) were males and remaining 72 (62.06%) were females. In similar to our study, Kim YJ et al [14] reported incidence of Herpes Zoster among females higher when compared with men (12.6/1000 person years vs 8.3/1000 person years. It is well known fact and also various studies from US, UK and Germany have reported incidence of Herpes Zoster is significantly higher among females [17-19].

In the present study, among 22 Immunocompromised patients group, 13 (59.1%) had diabetes mellitus, 5 (22.7%) had HIV, 2 (9.09%) patients were under steroid therapy, 1 (4.5%) patient had HIV-tuberculosis coinfection and 1 (4.5%) patient had COPD.

Buchbinder SP et al [11] stated that incidence of Herpes Zoster among HIV positive individuals was higher when compared to HIV seronegative individuals (29.4/1000 person years vs 2.0/1000 person years).

Increase in incidence of Herpes Zoster is higher among patients with HIV, SLE, RA, Cancers, IBD, MS, Diabetes, COPD, HTN, RF, Sjogrens syndrome [20-22].

Post Herpetic Neuralgia (28.4%) is the most common complication observed followed by Sensory loss (24.1%), Ocular complications (19.8%) and secondary infection (18.9%). Immuocompromised patients were predominantly reported with Herpes Zoster complications when compared to Immunocompetent patients.

PHN is responsible for a significant economic burden [23]. Post herpetic neuralgia is a debilitating complication of zoster. PHN is a pain present for 90 days or more after Herpes Zoster rash onset. Risk factors for PHN include elderly patient, greater severity, immunocompromised conditions, females, diabetes, sedentary life, presence of herpes zoster ophthalmicus [24]. PHN is a most common complication which is a challenging condition to treat.

Hope-Simpson RE [25] study also reported PHN as the commonest complication with predominant thoracic dermatomal involvement. Among Immunocompromised patients, rare complications such as myelitis, encephalitis, retinitis, hemiparesis due to herpes zoster presents as most common complications.

Gauthier et al [26] observed incidence of PHN1 and PHN3 as 19.5% and 13.7% respectively among Herpes Zoster patients. Gialloreti LE et al [27] documented that 9.4% of Herpes Zoster patients developed PHN1 & 7.2% develop PHN3.

Tran et al [28] showed recurrent rate of Herpes zoster ophthalmicus complications at 1,3,5& 6 years were 8%, 17%, 25% and 31% respectively.

Various therapeutic modalities has been using to reduce symptoms of herpes zoster and to avoid progression. Most of the pain relieving therapeutic modalities has been focusing to relieve neurogenic pain due to PHN. In this study, we have managed patients with valacyclovir 1000mg orally thrice in a day for 7 days or acyclovir 800 mg orally 5 times a day for 7 to 10 days depending on severity and immune status. For pain relieving, either predinosolone or analgesics and calamine lotion were prescribed.

Vaccination against varicella is established in some countries, especially among high risk groups include elderly age, immunocompromised patients. Vaccine reduces the incidence of Herpes Zoster and its severity and other complications of HZ like PHN, HZO [29]. HZ vaccination does not induce herd protection and may persist for upto 10 years.

CONCLUSION

Complications were observed most commonly among Immunocompromised patients, so clinician should treat these patients promptly like treatment of HZV infection and its associated pain, post herpetic neuralgia prevention, supporting treatment until neurological pain resolves .

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