SEASONAL INCIDENCE AND AGE-RELATED MORBIDITY AND MORTALITY OF VARICELLA IN KERALA

Junais Koleri[1], Soopy Kayanaduth[2]

[1]Assistant Professor, Infectious Diseases Unit, Department of General Medicine, Government Medical College, Kozhikode.
[2]Assistant Professor, Department of General Medicine, Government Medical College, Kozhikode.

ABSTRACT

BACKGROUND

As the incidence of varicella in children is decreasing, the infection rate in the adults is on the rise. This study attempts to identify the all-cause-mortality and morbidity rate of varicella in adults and also the seasonal pattern of varicella infection.

MATERIALS AND METHODS

Varicella is diagnosed clinically. The data is recovered from case records of all the patients admitted at Government Medical College, Kozhikode, continuously over 2007 to 2012.

RESULTS

640 patients were admitted with most of the cases in the age group of 20 to 40. 40% of the population belonged to above fifty years. The mean duration of hospitalisation was 21.5 days in elderly against 5 days in young patients. The mortality rate was also high in elderly (10.8% vs. 4%) The varicella epidemics peak towards January to April.

CONCLUSION

The duration of hospital admission and the all-cause-mortality is much high in elderly population with varicella. Hence, there should be attempts to vaccinate the susceptible elderly population. The disease peaks towards January to April; hence, resources can be planned accordingly for proper utilisation.

KEYWORDS

Varicella, Chickenpox, Seasonal Incidence, Vaccination, Immunisation.

HOW TO CITE THIS ARTICLE: Koleri J, Kayanaduth S. Seasonal incidence and age-related morbidity and mortality of varicella in Kerala. J. Evid. Based Med. Healthc. 2017; 4(1), 39-42. DOI: 10.18410/jebmh/2017/7

BACKGROUND

Varicella (chicken pox) is an acute viral infection with high infectivity. Only humans are affected and the secondary attack rate approaches 70%-90%.[1,2] Because of the high infectivity, varicella is generally a disease of the children. Fortunately, it is mild in children with infrequent complications and gets cured in a week even without antiviral treatment. On the contrary, when the disease occurs in elderly, the incidence of complications are more along with their attendant morbidity and mortality.[3] Hence, we did this study to know the incidence in elderly population and the all-cause mortality and morbidity resulting from varicella as either the primary cause or the precipitating event.

In temperate zones, varicella causes seasonal peaks in early spring and late winter. The seasons in temperate zone doesn't correlate well with the seasons in Kerala. Moreover, the trend has been found to vary in different parts of the world with peak towards March and April in Saudi Arabia and towards summer in parts of Australia.[4,5] Hence, in order to get information on the seasonal trend of varicella in Kerala, we gathered data on inpatient admission continuously over a period of six years and then compared the incidence against the months of admission.

Vaccination in children is of questionable benefit. Moreover, vaccination of children alone may shift the incidence to the elderly population, thus leading to increased mortality in the community.[6,7] The vaccine safety has been well proven.[8]

Pneumonia is the most lethal complication in varicella.[(6)] Skin and soft tissue infection, encephalitis, cerebellitis, DIC, hepatitis and pancreatitis are the other known complications.[9]

AIM OF THE STUDY

1. To identify the seasonal trend in varicella incidence.
2. Difference in duration of hospital stay between young and elderly (defined in this study as age more than 50 years).
3. Difference in mortality rate between young and elderly patients.

Financial or Other, Competing Interest: None.
Submission 07-12-2016, Peer Review 19-12-2016,
Acceptance 26-12-2016, Published 02-01-2017.
Corresponding Author:
Dr. Junais Koleri,
Assistant Professor, Infectious Diseases Unit,
Department of General Medicine,
Government Medical College, Kozhikode.
E-mail: drjunais@gmail.com
DOI: 10.18410/jebmh/2017/7

MATERIALS AND METHODS

Data retrieved from inpatient register and case records of Infectious Diseases Ward of Kozhikode Government Medical College regarding age, sex, month of admission, days of hospitalisation and outcome for the years 2007-2012 (total 6 years). Only those patients with age above 12 years included. Chicken pox was diagnosed clinically.

RESULTS

There were a total of 640 varicella cases admitted in ID ward in the years 2006 to 2012. Majority of the patients were in the age group 20-40 (277 cases). Age pattern of varicella is as shown in table 1 and represented in graph 1. 184 cases are of age above 50 years, making them 40% of the total cases.

Age Group	2007	2008	2009	2010	2011	2012	Total
13-20	16	18	16	12	14	16	92
21-30	36	37	37	18	22	16	166
31-40	22	27	22	14	14	12	111
41-50	11	27	14	10	15	10	87
51-60	14	22	12	8	16	7	79
61-70	8	16	13	5	11	9	62
71-80	6	5	8	5	5	5	34
81-90	1	3	1	1	2	1	9

Table 1. Age Distribution

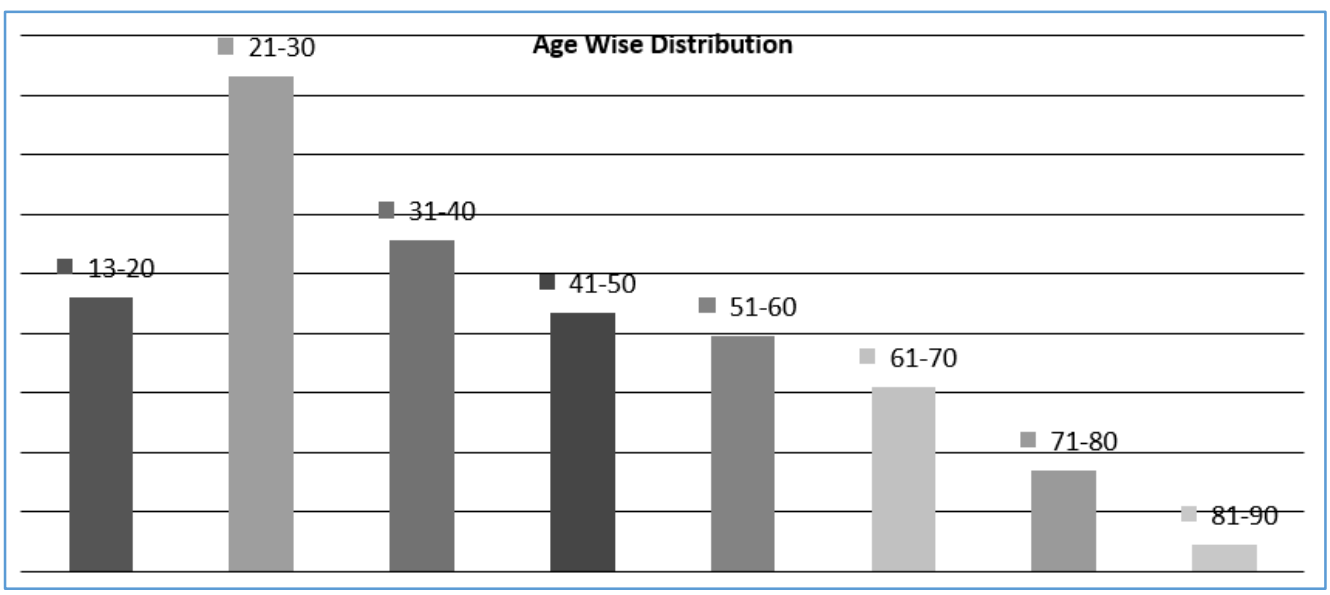

Figure 1. Age Distribution

The number of patients on average is 10 to 13 per month during the months of January to March and 5 to 6 in June and July. In August, there is another smaller peak with 7 to 8 cases per month (Table 2 and Graph 2).

Month	2007	2008	2009	2010	2011	2012
January	12	14	15	11	5	7
February	12	20	12	6	14	12
March	16	22	18	6	17	10
April	13	9	14	6	7	14
May	8	8	10	5	15	7
June	6	18	7	3	5	4
July	6	22	8	5	7	2
August	7	11	14	6	9	1
September	10	9	7	6	7	3
October	5	7	7	6	4	6
November	10	8	4	9	8	5
December	10	7	7	4	3	6

Table 2. Months of Incidence

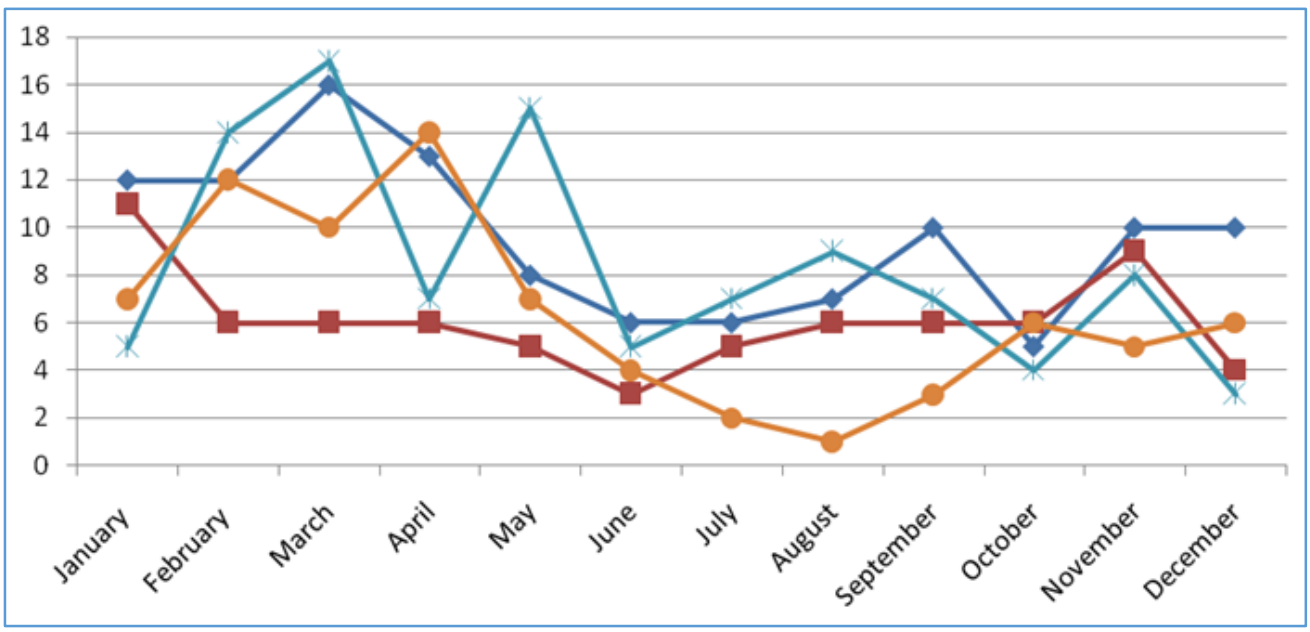

Figure 2. Months of Incidence

The mean duration of hospital admission was 5 days in young population and 21.5 days for those above fifty years of age. The average mortality rate was also high in those above fifty years (4% vs.10.8%) (Table 3).

Age	Number	Mean Hospital Stay (Days)	Number of Death	Mortality Rate
≤50	456	5	21	4%
>50	184	21.5	20	10.8%

Table 3. Age-Related Hospital Stay and Mortality

DISCUSSION

There were a total of 640 cases of varicella in the last 6 years. One important finding is the shift of case load from adolescents to those in 20 to 40 years group. This could be explained by the improvement in hygiene when compared to olden days and the relatively better social circumstances in Kerala when compared to rest of India. Whether, there is a similar shift in age pattern in other states should also be studied. Even though, the majority of the cases were in the young age group of 10 to 30. There were also a significant number of elderly people affected. It's of alarming concern that around 40% of the patients are above 50 years old.

The mean inpatient duration of elderly patients is much more than young population (5 days vs. 21.5 days) due to various factors like longer duration taken for healing of cases, associated comorbidities and minor complications like soft tissue bacterial superadded infection, hyponatraemia and encephalopathy. The mortality rate also is significantly more (4% vs. 10.8%). The high mortality is accounted to mostly by the varicella pneumonia and DIC.

As the mortality and morbidity is much more among elderly, there should be a healthcare plan towards either universal immunisation or immunising the susceptible elderly population. It should be noted that varicella infection in the elderly is a burden to the health system, which is easily preventable.

There is an annual peak in the incidence of varicella during the months of January to April. Number of cases start rising towards the end of December and is maximum in March. There is also a second peak towards August and September. Lesser incidence in rainy seasons could be attributed to the decreased social gatherings due to rain. Whether there is any change in the viability of the virus in different seasons is not known. It should be noted that this pattern may vary from region to region across the globe and this data may not be applicable in another latitude and longitude. Influenza, which also is spread by the respiratory route has a different seasonal predilection that it peaks in rainy season. Hence, it is possible that other than the human behavioural difference across seasons there might also be other virus related factors, which might influence the secondary attack rate.

This is additional information on seasonal trend could be of use in properly allocating the resources like isolation facility in the hospitals.

The data on cause of death and other parameters are not included in this study to maintain brevity.

CONCLUSION

1. Incidence of varicella peaks in the months of January to April.
2. 40% of the patients were above 50 years of age.
3. Mean inpatient duration for varicella infection is 5 days for those less than 50 years of age and 21.5 days for those above 50 years.
4. In hospital, mortality rate is 4% for young patients and 10.8% for elderly patients.
5. Chicken pox vaccination maybe advisable in those persons who never had natural infection in childhood.

REFERENCES

[1] Straus SE, Ostrove JM, Inchauspé G, et al. NIH conference. Varicella-zoster virus infections. Biology, natural history, treatment, and prevention. Ann Intern Med 1988;108(2):221-237.
[2] Wharton M. The epidemiology of varicella-zoster virus infections. Infect Dis Clin North Am 1996;10(3):571-581.
[3] Noah N. Adults still account for many deaths from chickenpox. BMJ 2002;325(7357):221.
[4] Miller ER, Kelly HA. Varicella infection-evidence for peak activity in summer months. J Infect 2008;56(5):360-365.
[5] Saleh N, Al Moghazy B. Seasonal variation and trend of chicken pox in the southern region of Saudi Arabia (2007-2012). J Egypt Public Health Assoc 2014;89(3):143-147.
[6] Galea SA, Sweet A, Beninger P, et al. The safety profile of varicella vaccine: a 10-year review. J Infect Dis 2008;197(Suppl 2):S165-169.
[7] Plotkin SA. Varicella vaccine. Pediatrics 1996;97(2):251-253.
[8] Newman RD, Taylor JA. Reactions of pediatricians to the recommendation for universal varicella vaccination. Arch Pediatr Adolesc Med 1998;152(8):792-796.
[9] CDC. Varicella. 2015 Aug 11. http://www.cdc.gov/vaccines/pubs/pinkbook/varicella.html