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Original Article

Outcome of chicken pox in adult immunocompetent patients

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Abstract ***Objective*** To observe the outcome of chicken pox in adult immunocompetent patients.

Patients and methods In this cross-sectional analytical study, during a period of 14 months starting from May 2003 to Jun 2004, 200 adult patients aged between 15 and 40 were hospitalized and observed for the evolution of chicken pox after carefully fulfilling the exclusion and inclusion criteria. Patients were assessed by history, clinical examination and relevant laboratory investigations. The disease was subjectively categorized as mild, moderate and severe according to the intensity of eruption. Number of days required till resolution of infection was noted. Treatment was prescribed as per the protocol according to the severity of disease. Complications were noted among all the patients.

Results 181 (90.5%) of our patients had mild/moderate infection and were treated symptomatically, while 19 (9.5%) had severe eruption and were given acyclovir. Mean age of patients was 23.3±5.41 years (range 15-40 years). 183 (90.3%) were males and 17 (9.5%) were females. Mean resolution time was 7.75 (+/-3.12) days in mild/moderate cases and 7.68 (+/-3.86) days in severe cases. 4 (2%) cases of bacterial superinfection and 1 (0.5%) case of varicella pneumonia was diagnosed and treated.

Conclusion Chicken pox in adult patients in our population presents as a mild infection in majority of the patients. The rate of complications is low as compared to western population.

Key words
Chicken pox, immunocompetent adults, evolution of disease, complications.

Introduction

'Chicken pox' is regarded as a benign, self-limiting illness of children rendering life long immunity. However, it can be a potentially serious and life threatening condition in adults.[1] Although varicella is less readily transmittable than measles, it is nonetheless highly contagious with secondary attack rates in susceptible household contacts of greater than 85%.[2]

The epidemiologic and seroprevalence data from around the world suggest a difference between temperate and tropical regions. In temperate countries more than 90 percent of population is seropositive by the age of 20 years.[2] In tropical climates, on the other hand, around 50 percent of population is still seronegative by the age of 20 years.[3] This finding has been verified by the only epidemiologic study of chicken pox done in

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Pakistan,[4] and other similar studies from the region.[5,6,7]

It was speculated that as the seroprevalence of chicken pox is different in our population, the outcome of infection could also be different. No such studies could be found in the Pakistani medical literature. Thus the need was felt to report such data in our population. The present study describes the presentation, severity, resolution time and 'complications' of chicken pox in 'immunocompetent adults' in a Pakistani segment of population.

Patients and methods

Objective To observe the outcome of chicken pox in adult immunocompetent patients.

Study design and setting This cross-sectional analytical study was undertaken at the Combined Military Hospital Malir, Karachi, Pakistan and Combined Military Hospital Abbottabad, Pakistan, simultaneously. The approval for the study was taken by the medical ethics and scientific committee of the respective hospitals. Written informed consent was taken from all the participating patients.

Inclusion criteria Patients over 15 years of age and willing for admission, presentation within 48 hours of development of rash, no known hypersensitivity to acyclovir, no past history of development of chicken pox.

Exclusion criteria Pregnant ladies, children less than 15 years of age, known cases of deranged immune status, patients taking any other long-term medication including immunosuppressives and history of acyclovir intake.

During a period of 14 months starting from May 2004 to Jun 2005, a total of 200 consecutive patients were entered into the study. After fulfilling the inclusion and exclusion criteria patients were admitted to hospital and kept in isolation wards and observed for the 'evolution of the disease'. Diagnosis was established on clinical grounds. Disease was categorized as mild/moderate or severe on the basis of intensity of eruption and presence of constitutional symptoms. The intensity of eruption was graded clinically and to standardize we devised a grading system as shown in Table 1. At the time of admission to hospital, following investigations were done in all the patients: complete blood count, platelet count, urine for routine examination, chest X ray, serum for urea, creatinine and liver function tests, vesicle fluid and/or crust for gram staining and bacterial culture to rule out superadded bacterial infection and sputum for gram staining. In patients with severe eruption further investigations were done to determine underlying immunosuppression. These included hepatitis B surface antigen, anti hepatitis C virus antibodies, HIV screening and blood glucose fasting levels. Standard treatment protocols for chicken pox in adults were followed. All patients with severe eruption received oral acyclovir 800 mg/5 times a day for 7 days. Patients with mild/moderate eruption received symptomatic treatment (antipyretics, antihistamines and calamine lotion for local application). In these patients, detailed clinical assessment was made daily and chest X ray PA view was done at the time of

admission to hospital for early detection of varicella pneumonia. Diagnosis of varicella pneumonia was made clinically as well as radiologically on the basis of chest x-ray PA view. In cases of bacterial superinfection, cloxacillin capsules 500 mg every 6 hours for 5-7 days were given. Formation of dry crusts was kept as the end point of the study and thereafter patients were discharged from hospital.

The statistical analysis of the data was done using statistical program SPSS version 8.0. Descriptive analysis was done for age, gender, residence, disease severity, treatment received and complications. The mean with standard deviation, frequency and percentages were reported. For the purpose of comparative analysis, the continuous variables were recoded into categorical variables.

Results

200 adult patients aged 15 years to 40 years (mean 23.35, SD 5.37) were evaluated during the study period. There were no dropouts due to indoor management of the patients. The parameters used to evaluate our patients were age, sex, residence, duration of illness, time taken to resolution, complications and laboratory profile. Out of these 200 patients, 183 (90.5%) were males and 17 (9.5%) were females. Patient population represented all four provinces of Pakistan as well as Azad Kashmir, the break up of which is given in **Table 2**. Majority of the patients had mild/moderate eruption (n=181, 90.5%) for which they received only symptomatic treatment while 19 (9.5%) had severe eruption and were given oral acyclovir. Mean resolution time in males was 7.92±3.09 days in mild/moderate eruption and 8.92±4.40 days in severe eruption. In females the resolution time was 4.90±2.20 days in mild/moderate eruption and 5.57±0.98 in severe eruption. Age and sex distribution is also shown in figure 1. Overall mean resolution time was 7.75±3.12 in mild/moderate eruption and 7.68±3.86 in severe eruption. 1 (0.5%) case of varicella pneumonia was diagnosed based on clinical features and confirmed radiologically**.** This patient was started on injection acyclovir 10mg/kg intravenous 8 hourly for 7 days and he responded well. 4 (2%) cases of bacterial superinfection were also diagnosed. Rest of the findings is detailed in **Table 2**.

Discussion

Chicken pox in adults and adolescent patients is generally considered a serious disease. Most of the pertaining data is based on western population. We have already seen that seroepidemiology of chicken pox is different in temperate and tropical climates.[4] This could mean a different disease response in warm climates. Our results suggest that this hypothesis may be true. We have seen that majority of our patients had a mild/moderate disease which settled with symptomatic treatment. The outcome of disease in adults as seen in this study is about the same as has been observed in children in western population.[8]

The grading of chicken pox as mild, moderate or severe is based on clinical assessment, as there are no established criteria for this purpose. We think it is more important in adult cases of chicken pox as the decision regarding treatment with

Table 1 Clinical assessment of disease severity.

Mild	*Moderate*	*Severe*
• Sparse rash • No or mild constitutional symptoms • Fever up to 99°F • Mild cough • Isolated oral lesions	• Dense rash • Fever up to 101°F • Productive cough • Myalgias • Few oral lesions • Throat congestion	• Confluent rash • Severe constitutional symptoms • Fever more than 101°F • Prostration with severe myalgias • Many oral lesions with ulceration • Throat congestion

Table 2 Demographic characteristics.

Variables	*Number*	*Mean (range)*	*Standard deviation*	*Percent*	*95% CI LB-UB*	*Standard error*
All patients	200	23.35 years (15-40 years)	5.41	100	22.59-24.10	0.38
Age						
Male	183	23.14 years	5.30	90.5	22.37-23.92	0.39
Female	17	25.53 years	6.20	9.5	22.34-28.72	1.50
Residence						
NWFP	74			37		
Punjab	85			42		
Sindh	30			15		
Balochistan	3			1.5		
AK	8			4		
Treatment						
Symptomatic (male/female)	181 (171/10)	7.75 days (7.92/4.90)	3.12 (3.09/2.02)	90.5	7.29-8.21	0.23 (0.24/0.64)
Acyclovir (male/female)	19 (12/7)	7.68 days (8.92/5.57)	3.86 (4.40/0.98)	9.5	5.82-9.54	0.89 (1.27/0.37)
Complications						
Bacterial infection	4			2		
Pneumonia	1			0.5		

acyclovir has to be made. We devised our own system, which served us well. Out of two hundred, 17 patients were labeled as severe on this basis and were given oral acyclovir. One case of viral pneumonia was detected out of these seventeen while no complication was seen among mild/moderate cases.

Large number of our patients represented young army recruits as the centers chosen for the study have a number of army recruiting centers. These centers provide ideal conditions for the spread of infection. Recruits belong to age group 19-23 years. The average age of our patients i.e. 23.3 years may be influenced by this and may not reflect the true average age for chicken pox in adults in Pakistani population.

A UK based study[9] has shown a longer resolution time in female patients. However,

our results are on the contrary. We have seen a shorter resolution time in females. This could possibly be a different disease response in our population but needs to be further validated through larger population based studies, as the female sample size in our study was too small.

A recently published study from USA has presented the complications related figures of the last 10 years, which show a rate of bacterial superinfection as 21 percent and varicella pneumonia as 22 percent in the adult age range of varicella cases.[10] These statistics have been validated by other studies as well.[11-14] One study has demonstrated a death rate of about 25 percent in cases with most severe infection.[15] The results of our study have shown a very low complication rate i.e. varicella pneumonia (0.5 %), bacterial superinfection (2%). We think the low rate of bacterial superinfection may possibly be due to hospital admission and regular observation of the patients in a relatively sterile environment. Low platelet count as well as vasculitis leading to disseminated intravascular coagulation have also been reported from Pakistan but not seen by us.[16,17]

Management protocol of chicken pox has been evolving. Currently it is recommended to use acyclovir in immunocompromised patients, susceptible neonates and acutely ill patients.[8,9] However, in immunocompetent adults the treatment is controversial.[18] These recommendations are based on studies that have been conducted on the western population. The findings of our study suggest that chicken pox in adults is a milder disease in Asian population and the majority of patients resolve with symptomatic treatment only. More studies are required in this direction to establish the treatment protocols based on our population.

Recently, a systematic review of randomized, controlled trials for the use of acyclovir in chicken pox has been done. The authors have concluded that acyclovir appears to reduce the lesion healing time from 7 days to 5 days, but all the studies reviewed have not been able to establish the difference.[8] Another controlled trial has supported this finding only when acyclovir is started within 24 hours of development of rash. When acyclovir is started between 24 to 48 hours of development of rash, the difference has not been found to be statistically significant.[19] Our results are also consistent with this finding.

Conclusion

The burden of varicella is immense in Pakistan. Disease has a milder picture with a very low complication rate in adults as compared to western population. Majority will require symptomatic management only. Therefore, judicious and cost effective treatment strategy is warranted.

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