

# Factors Associated with Prolonged Hospital Stay among Adult Patients with Chickenpox in Pakistan: A Prospective Cohort Study

Ahsan Tameez-ud-din<sup>1</sup>, Aisha Akhtar<sup>1</sup>

## Abstract

**Background:** Chickenpox is a highly contagious viral disease characterized by a polymorphic rash and systemic manifestations. Although traditionally considered a childhood illness, its prevalence among adults is notably higher in tropical regions such as Pakistan, where it is often associated with poorer outcomes. However, factors contributing to adverse prognosis in adults remain insufficiently explored. This study aimed to identify factors affecting outcomes among hospitalized adult patients with chickenpox.

**Methodology:** A prospective cohort study was conducted at Pak Emirates Military Hospital and Combined Military Hospital, Rawalpindi, from July 1 to December 31, 2024. After obtaining informed consent, patients were admitted to the dermatology ward, and baseline investigations were performed. All patients received acyclovir upon admission and were followed throughout their hospital stay. Data were analyzed using SPSS version 23.0.

**Results:** A total of 53 patients were included, with a mean age of 30.63 years (range: 17–41 years). The mean duration of hospital stay was 5.53 days, while the mean total duration of illness was 7.79 days. Dysphagia ( $p = 0.014$ ) and high-grade fever ( $p = 0.012$ ) were significantly associated with prolonged hospital stay. In contrast, transaminitis ( $p = 0.586$ ), thrombocytopenia ( $p = 0.492$ ), leukopenia ( $p = 0.651$ ), and initiation of acyclovir within 72 hours of symptom onset ( $p = 0.126$ ) were not significantly associated with prolonged hospitalization.

**Conclusion:** Chickenpox represents a significant health burden among adults in Pakistan. Dysphagia and severity of fever are important predictors of prolonged hospital stay. Early identification and management of high-risk patients may help reduce disease severity and alleviate pressure on healthcare systems.

**Keywords:** Varicella; adult population; hospitalization; risk factors; disease severity

**How to cite this article:** Tameez-ud-din A, Akhtar A. Factors associated with prolonged hospital stay among adult patients with chickenpox in Pakistan: a prospective cohort study. Pak J Public Health. 2026;16(1):27-30.

DOI: <https://doi.org/10.32413/pjph.v16i1.1599>

**Copyright** © 2026 The Author(s). Published by Health Services Academy. This is an Open Access article under the CC BY-NC 4.0 license.

## Introduction

Chicken pox is a highly contagious viral disease which presents with a polymorphic skin rash along with systemic symptoms. It is an important public health issue and is classically considered to be a disease of childhood but the prevalence in adults is considerably higher in tropical countries like Pakistan where the seropositivity rate by the age of 20 years is often less than 50% in the population (1-3). The disease is more severe in adults and a few reports of fatal outcome have also been reported (4-6). The relatively poor prognosis may be due to a wide interplay of factors which have not been widely explored in the literature. There is a lack of reliable data regarding the exact prevalence of this disease in Pakistan but the data from neighboring countries like Iran report a high Seroprevalence of almost 80% while a study from Thailand reported a very high rate of 96.1% in adolescents aged 31-39 years (7,8).

Owing to the high disease burden and its public health and economic implications, local studies concerning the different aspects of this disease are invaluable. The aim of this study was to assess the factors affecting the outcome of hospitalized patients with chickenpox. Adults have a more severe disease course and early recognition of the factors associated with a prolonged illness may result in early intervention. This will help reduce the complications and will ultimately translate into the alleviation of some of the burden of the public health institutes. Few studies have been conducted in Pakistan regarding the outcomes of adult chicken pox patients despite it being a common public health problem, and this study is an effort to bridge this gap in the knowledge.



<sup>1</sup> Pak Emirates Military Hospital, Rawalpindi, Pakistan

## Correspondence:

Ahsan Tameez-ud-din  
ahsantameezuddinmalik@gmail.com

**Submitted:** 06-01-2025

**Revised:** 04-02-2026,  
14-02-2026

**Accepted:** 28-02-2026

**Published:** 28-03-2026

## Methodology

This prospective cohort study was conducted at Pak Emirates Military Hospital and Combined Military Hospital, Rawalpindi from 01-07-2024 to 31-12-2024 (6 months). Ethical approval was obtained from the Ethical Committee, Military Hospital, Rawalpindi. Letter# A/28/ERC/196/24. All patients with chicken pox presenting to dermatology OPD were included. Immunosuppressed individuals and those suffering from any serious systemic illness were excluded from the study. Purposive sampling technique was employed. Written informed consent was taken from the patients before the collection of data. Sample size was calculated to be 56 by the following formula using the parameters as follows:

$$n = [ 2 * (Z1-\alpha/2 + Z1-\beta)^2 * \sigma^2 ] / (\mu1 - \mu2)^2$$

- Expected mean hospital stay of patient group with risk factors ( $\mu1$ ): 8 days
- Expected mean hospital stay of patient group with no risk factors ( $\mu2$ ): 5 days
- Standard deviation ( $\sigma$ ): 4 days (assumed)
- Desired power: 80% ( $Z1-\beta = 0.84$ )
- Type I error: 5% ( $\alpha = 0.05$ ,  $Z1-\alpha/2 = 1.96$ )
- Sample size per group: 28
- Total sample size:  $28 \times 2 = 56$  participants

After informed consent, the patients were admitted in dermatology ward and baseline investigations (CBC, LFTs, RFTs, Chest Xray) were performed. Patients were started on acyclovir on admission and were followed during the course of hospital stay with CBC and LFTs on every 3<sup>rd</sup> day. Primary outcome measure was the mean hospital stay duration (continuous outcome model). The patients were discharged from the hospital when their disease resolved and the disease resolution was defined as the absence of systemic features, no new lesion formation and crusting > 90% of existing lesions. The data was collected on a printed questionnaire. (Annexure A).

The data was entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 23.0. Mean was calculated for hospital stay duration and total duration of illness along with laboratory parameters (Hemoglobin, platelet count, total leukocyte count and alanine aminotransferase levels). The results were reported as frequencies, percentages and figures and Normality of the data was checked by using Shapiro-Wilk test and histogram plots. Multivariate analysis was done using Multiple linear regression to find the association between duration of hospital stay and quantitative variables (starting acyclovir within 72 hours of the onset of illness, presence of dysphagia, secondary bacterial illness, oral lesions, thrombocytopenia, leukopenia, transaminitis, the infusion of intravenous fluids during the hospital stay and grade of fever). A p value  $\leq 0.05$  was considered significant.

## Results

Out of the total 53 patients, only 4 (7.54%) were females while the rest were males. Forty-one (77.4%) patients were married

and of these married patients, 38 (92.7%) reported having kids. Out of these 38 patients, only 11 (28.9%) said that their kids had ever suffered from chicken pox. The mean age of our patients was 30.63 years (range=17- 41years). The main outcome measure in our study was the hospital stay duration which was 5.53 days while the mean total duration of illness (start of fever to disease resolution) was 7.79 days. A majority of patients ( $n=32$ , 60.4%) reported that they were not aware of the source of their infection while 11 (20.8%) and 10 (18.9%) implicated their family members and co-workers respectively. Table 1 summarizes the frequency of the key factors which were assessed for their possible association with a prolonged hospital stay in chicken pox patients.

**Table 1: Key factors assessed in chicken pox patients (significant associations with prolonged hospital stay are in italics)**

Factor	Yes n (%)	No n (%)
<i>Dysphagia</i>	26 (49.1%)	27 (50.9%)
Oral lesions	39 (73.6%)	14 (26.4%)
<i>High grade fever</i>	22 (41.5%)	31 (58.5%)
Secondary bacterial infection	5 (9.4%)	48 (90.6%)
Leukopenia	7 (13.2%)	46 (86.8%)
Thrombocytopenia	22 (41.5%)	31 (58.5%)
Transaminitis	24 (45.3%)	29 (54.7%)
Aciclovir within 72 hours of illness onset	38 (71.7%)	15 (28.3%)

Dysphagia was reported in 26 (49.1%) and oral lesions in 39 (73.6%) at admission. Presence of dysphagia was significantly associated with the duration of hospital stay ( $p=0.014$ ) and the mean duration was 6.53 days in these patients. Leukopenia was found in only 7 (13.2%) patients at admission while thrombocytopenia in 41.5% ( $n=22$ ). Neither had significant impact over the length of hospital stay ( $p=0.651$  and  $p=0.492$  respectively). Transaminitis (raised Alanine Aminotransferase level) was reported in 24 (45.3%) patients but did not significantly impact the duration of hospital stay. ( $p=0.586$ ). The mean laboratory findings are summarized in Table 2.

**Table 2: Shows the mean values of the laboratory investigations done at the admission**

Laboratory investigation at admission	Mean value	Standard Deviation
Hemoglobin (g/dL)	13.96	1.16
Total leucocyte count (/ $\mu$ L)	5700	1.87
Platelet count (/ $\mu$ L)	148000	42.87
Alanine Aminotransferase (U/L)	65.1	75.57

Acyclovir was started within 72 hours of the onset of illness in 38 (71.7%), it did not influence the primary outcome significantly ( $p=0.126$ ). High grade fever (>100 F) was recorded in 22 (41.5%) while rest had low grade fever. Severity of fever was associated with significantly prolonged hospital stay ( $p=0.012$ ). The mean hospital stay duration in these patients was 6.77 days. Other non-significant associations included the development of secondary bacterial infection ( $n=5$ , 9.4%,  $p=0.164$ ) and the infusion of intravenous fluids during the hospital stay ( $n=12$ , 22.6%,  $p=0.360$ ). Antibiotics were prescribed to 7 (13.2%) patients.

## Discussion

Chicken pox is a common public health problem in Pakistan and affects people of all the age groups. A majority of our patients were male (92.46%) which was similar to the data reported by Ejaz et al (90.3%) (3). Both of these studies were conducted in Military hospitals which cater to the health problems of a large number of military recruits who have a high risk of the spread of infection owing to their living arrangements in close quarters. This may explain the skew towards one gender. In contrast to our study, Naseem et al. reported a slightly higher prevalence of this infection in females (45.2%) than males (39.6%) (4). The mean hospital stay was 5.53 days while the duration of illness (from the onset of rash to disease resolution) was 7.79 days in our patients which was almost similar to the figure of 7.75 days reported by Ejaz et al (3). Kujar et al reported a higher mean duration of 9 days in a study conducted in India (9).

Mean platelet count in our patients was 148,000/  $\mu\text{L}$  and thrombocytopenia was reported in 41.5% patients at admission. Bari et al reported a mean platelet count of 159,000/  $\mu\text{L}$  in adult chicken pox patients and found a significant difference from the mean platelet count of age and sex-matched controls ( $p < 0.001$ ) (10). This was in contrast to our study where thrombocytopenia did not have significant impact on the hospital stay duration. Transaminitis has been widely reported in the literature to be associated with adverse outcomes in chicken pox patients (11,12). Fang et al. reported a case of lethal fulminant hepatic failure resulting from chicken pox infection in an elderly lady, who reported with transaminitis and thrombocytopenia, but there was no significant association between raised ALT at admission and prolonged hospital stay in our study (11). The presence of high-grade fever was significantly associated with prolonged hospital stay ( $p = 0.012$ ). This was in line with the study conducted by Ejaz et al. who categorized the patients with fever of more than 101 F as having severe infection which was associated with a prolonged duration of illness (mean=8.92 days) (3).

Dysphagia at admission was associated with a significantly prolonged hospital stay in our patients ( $p = 0.014$ ). Dysphagia is associated with adverse outcomes in patients hospitalized with a variety of diseases and more recently, its association with adverse outcomes in Covid-19 patients has renewed the debate regarding the importance of palliative care and nursing care in the management of hospitalized patients with acute pathologies (13-15). Five of our patients (9.4%) developed secondary bacterial infection during the course of their hospital stay but it did not contribute significantly to their hospital stay duration ( $p = 0.053$ ). Seven (13.2%) patients received oral antibiotics. Ejaz et al. reported a secondary infection rate of 2%, which was lower than our study (3). Secondary bacterial infections have been reported to complicate a variety of viral diseases albeit in small proportions. Ramzan et al. reported a secondary bacterial infection in 3.14% of the included patients with Covid-19 but a concerning high (89.69%) number of the patients had been prescribed

antibiotics (16).

Our study did not find any significant association between starting acyclovir within 72 hours of the onset of illness and the hospital stay duration. Evidence suggests that acyclovir may shorten the disease duration and further studies may be required to assess the short and long-term benefits of the drug in our population (3).

## Limitations

The gender distribution of patients is not representative of general population as the data was collected from military hospitals with a major proportion patients being male army recruits. The small sample size may also limit the generalizability of the results due to small sample size bias. Purposive sampling was employed which may have introduced bias in the final analyses.

## Conclusion

Chicken pox is a common public health problem in Pakistan and afflicts a large proportion of the adult Pakistani population. Dysphagia and severity of fever are predictors of prolonged hospital stay. These factors may help identify patients at risk of severe disease and early intensification of management may help improve their prognosis. This will ultimately help relieve the strain on over-burdened public health institutions by reducing the risk of complications and shortening the hospital stay duration of these patients.

## Ethical Approval:

This study was approved by the Ethical Committee, Military Hospital, Rawalpindi.

Ref. No. A/28/ERC/196/24 Dated: 24-06-2024

**Data Availability:** The data that support the findings of this study are available from the corresponding author upon reasonable request.

**Financial support and sponsorship:** No external funding was received for the publication of this article. Only patients entitled for treatment in PEMH were recruited.

**Conflict of interest:** There are no conflicts of interest associated with this publication.

**Disclaimer:** An abstract of the research was presented at the 43<sup>rd</sup> Conference of Pakistan Association of Dermatologists, conducted through 15<sup>th</sup> to 17<sup>th</sup> of November 2024 at Expo Center, Lahore. No monetary compensation/ honorarium was received, and the purpose of presentation was purely academic.

## Authors' Contribution:

**AT:** Conception of study, acquisition and analysis of data, drafting of article and revision of article along with submission.

**AA:** Conception and design of study, acquisition and analysis of data, major revisions of the article.

Both the authors agree to be accountable for all aspects of the work related to the precision or reliability of the article.

## References

1. Ayoade F, Kumar S. Varicella-zoster virus (chickenpox). StatPearls [Internet]. 2024 [cited 2024 Aug 8]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK448191/>
2. Akram DS, Qureshi H, Mahmud A, Khan AA, Kundi Z, Shafi S, et al. Seroepidemiology of varicella-zoster in Pakistan. *Southeast Asian J Trop Med Public Health*. 2000;31(4):646-9.
3. Ejaz A, Raza N, Sohail M. Outcome of chicken pox in adult immunocompetent patients. *J Pak Assoc Dermatol*. 2006;16(3):141-6.
4. Naseem Z, Ayub M, Shah SA, Ali S, Abidi SH. Viral infections in Pakistan: Prevalence, factors affecting spread, and recommendations for control. *J Infect Dev Ctries*. 2022;16(6):913-26.
5. Bhatti MA, Manglani CB, Khan MA. Fatal case of chickenpox in an adult: a case report. *J Pak Med Assoc*. 2004;54(2):104-6.
6. Sharma A, Agarwal S, Sharma A, Kumar M. Varicella gangrenosum in adult: a fatal chickenpox complication. *BMJ Case Rep*. 2019;12(4):e226363.
7. Al Kaabi N, Al Olama FM, Al Qaseer M, Al Ubaidani I, Dinleyici EC, Hayajneh WA, et al. The clinical and economic burden of varicella in the Middle East: a systematic literature review. *Hum Vaccin Immunother*. 2020;16(1):21-32.
8. Migasena S, Simasathien S, Desakorn V, Phonrat B, Suntharasamai P, Pitisuttitham P, et al. Seroprevalence of varicella-zoster virus antibody in Thailand. *Int J Infect Dis*. 1997;2(1):26-30.
9. Kujur A, Kiran KA, Kujur M. An epidemiological study of outbreak investigation of chickenpox in remote hamlets of a tribal state in India. *Cureus*. 2022;14(6).
10. ul Bari A, ber Rahman S. Hematological abnormalities in adult patients of chicken pox. *J Pak Assoc Dermatol*. 2004;14(4):193-7.
11. Fang C, Wong J, Ang WW. Fulminant varicella hepatitis: a rare but lethal cause of abdominal pain. *BMJ Case Rep*. 2021;14(9):e244081.
12. McSteen BW, Ying XH, Lucero C, Jesudian AB. Viral etiologies of acute liver failure. *World J Virol*. 2024;13(3):97973.
13. Altman KW, Yu GP, Schaefer SD. Consequence of dysphagia in the hospitalized patient: impact on prognosis and hospital resources. *Arch Otolaryngol Head Neck Surg*. 2010;136(8):784-9.
14. Zuercher P, Moret CS, Dziewas R, Schefold JC. Dysphagia in the intensive care unit: epidemiology, mechanisms, and clinical management. *Crit Care*. 2019;23:1.
15. Eyigör S, Umay E. Dysphagia management during COVID-19 pandemic: A review of the literature and international guidelines. *Turk J Phys Med Rehabil*. 2021;67(3):267.
16. Ramzan K, Shafiq S, Raees I, Mustafa ZU, Salman M, Khan AH, et al. Co-infections, secondary infections, and antimicrobial use in patients hospitalized with COVID-19 during the first five waves of the pandemic in Pakistan: findings and implications. *Antibiotics*. 2022;11(6):789.