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PREVALENCE OF VARICELLA IN INDIA

Introduction

Varicella, commonly known as chickenpox, is an acute, highly contagious disease caused by the Varicella-Zoster Virus (VZV), which belongs to the Herpesviridae family. The infection spreads mainly through airborne respiratory droplets and direct contact with vesicular fluid. Clinically, it is characterized by fever, malaise, and a distinctive vesicular rash appearing in successive crops. Although the disease is usually mild in children, it can lead to serious complications such as pneumonia, encephalitis, and secondary bacterial infections, particularly in adults, pregnant women, and immunocompromised individuals [1].

In India, varicella remains an endemic infection and continues to be a significant public health issue. The epidemiological pattern of varicella in tropical countries such as India differs considerably from that observed in temperate regions. In temperate climates, the majority of infections occur during early childhood, resulting in widespread immunity by adolescence. However, several studies from India have demonstrated a delayed age of primary infection, leaving a considerable number of adolescents and adults susceptible to the disease [2]. This shift in infection age is of concern, as varicella tends to be more severe in adults, often leading to higher rates of complications and hospitalization.

Serological studies conducted across various parts of India have revealed a gradual rise in VZV immunity with age. According to Lokeshwar et al. (2000) [2], the prevalence of varicella antibodies increased from about 29% among children aged 1–5 years to over 90% among adults aged 31–40 years. Subsequent research has confirmed similar patterns, showing that between 20–50% of children under 10 years remain susceptible to infection, compared to 80–90% immunity among adults [3]. These findings highlight the continuous circulation of the virus in Indian communities and the risk of outbreaks in groups with low immunity levels [1].

The seasonal pattern of varicella in India typically peaks during the late winter and early summer months (February to April). This increase coincides with climatic conditions

favorable for viral transmission and greater interaction among school-aged children. Recurrent outbreaks have been documented in schools, hostels, and healthcare facilities across states such as Kerala, Tamil Nadu, Maharashtra, and Delhi, underscoring the virus's persistent endemicity [3]. However, the true burden of the disease is likely underreported due to limited surveillance, lack of mandatory notification, and inadequate outbreak monitoring (ICMR, 2021).

Although varicella is a vaccine-preventable disease, its prevention in India remains suboptimal. The varicella vaccine, introduced in the early 2000s, is currently part of the optional immunization schedule rather than the Universal Immunization Programme (UIP). The Indian Academy of Pediatrics (IAP) recommends two doses of the vaccine – the first at 15–18 months and the second at 4–6 years of age. However, vaccination coverage remains inconsistent, as it is primarily limited to the private healthcare sector, leaving large sections of the population, particularly in rural and underserved areas, unprotected [4].

Strengthening varicella control in India requires improved surveillance, enhanced vaccine coverage, and periodic sero-epidemiological assessments to identify immunity gaps. Expanding vaccine inclusion under the UIP and implementing targeted immunization programs for high-risk groups such as healthcare workers and students could significantly reduce infection rates and complications. Moreover, integrating varicella surveillance into existing communicable disease monitoring systems would enable early detection and containment of outbreaks.

Goal

This study aims to evaluate the prevalence of varicella (chickenpox) in India, while also examining the major factors contributing to the transmission and spread of this disease.

Material and Methods of research

The data was collected from scientific literature, official health databases, and governmental and institutional reports related to varicella (chickenpox) in India.

The results of the research and their discussion

Varicella continues to circulate widely in India, and seroprevalence studies indicate that a substantial portion of children and adults remain susceptible to infection. For instance, one major multicity study of individuals aged 1–40 years found overall seropositivity of about 68 %, with only ~29 % of children aged 1–5 years and ~51 % of children aged 5–10 years immune – implying large susceptible pools in childhood. Among adult and specialrisk populations, susceptibility remains noteworthy: in a study of pregnant women in south India, approximately 23 % were seronegative for varicella antibodies; in healthcare workers, seropositivity has been around ~76 % (leaving ~24 % susceptible).

Outbreak investigations provide further insight into active transmission. In a rural southern Indian epidemic, the overall attack rate was ~5.9 %, but significantly higher in older age groups (≈15.9 % under age 5, ~11.1 % among 5–15 yrs, ~24 % in those aged ≥16). In a tribal/industrial zone (Dadra & Nagar Haveli), 149 cases were recorded during December 2016–February 2017, with attack rates of 4.5 % in one village and 19.1 % in another (ages ranged from 6 months to 55 years). Another outbreak among male military recruits found that out of 167 personnel, 90 (53.9 %) were initially susceptible and the secondary attack rate was ~21.4 %. These outbreak figures underscore that in closed or highdensity settings, the susceptible fraction converts into cases at nontrivial rates.

Serological studies show that 70–90% of children are exposed to VZV by adolescence. Outbreaks are frequent in urban and densely populated areas, with northern and southern states most affected. The Varicella vaccine is recommended by the Indian Academy of Pediatrics (IAP) but is not yet included in India's Universal Immunization Program (UIP) [4].

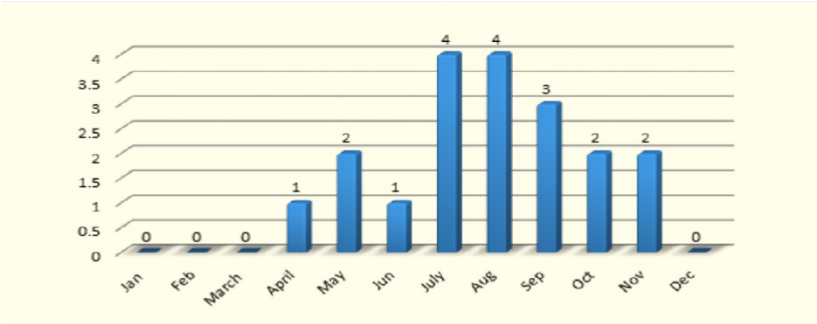

Figure 1 – Seasonal pattern of chicken pox in Kashmir region, India [3]

Seasonal Trend (Kashmir, 2023–2024)
Low incidence: December–March (0 cases)
Increasing cases: April–June (1–2 cases)
Peak incidence: July–August (4 cases)
Declining cases: September–November (2–3 cases)

Transmission takes place through respiratory droplets or direct contact with vesicular fluid, often leading to outbreaks in schools and densely populated areas. Variations in immunity and disease burden are seen across regions due to uneven vaccine coverage. Although generally mild in children, varicella can cause serious complications in adults. Strengthening national surveillance and expanding vaccination coverage are crucial for effective control and prevention of the disease in India [2].

Conclusion

Varicella continues to be an important public health issue in India, primarily affecting children and adolescents. While usually mild, the infection can cause serious complications in adults and immunocompromised individuals. Data show seasonal outbreaks across different regions, reflecting gaps in immunity and limited vaccination coverage. Although effective vaccines exist, they are not yet part of the universal immunization program, restricting their preventive potential. Enhancing disease surveillance, raising public awareness, and incorporating varicella vaccination into routine immunization schedules are crucial to reducing the incidence and complications of the disease in India.

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