Unveiling the Uncertainties: Exploring the Utility of Herpes Zoster Vaccines

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INTRODUCTION

Herpes zoster, commonly known as shingles, is a viral infection caused by the reactivation of the varicella-zoster virus (VZV). After primary infection with VZV, which causes chickenpox, the virus remains dormant in the sensory ganglia. However, it can reactivate later in life, leading to the development of shingles. Shingles typically presents as a painful, unilateral, and vesicular rash along the distribution of sensory nerves. The condition can be associated with significant morbidity, including severe pain, postherpetic neuralgia (PHN), and other complications. In this editorial, we will delve into the global and Indian burden of herpes zoster, explore its complications, highlight the importance of prevention, shed light on the Shingrix vaccine, discuss its composition, and present the research on safety and efficacy, including the ZOE-50 and ZOE-70 studies. Furthermore, we will review the recommendations on the Shingrix vaccine by leading global medical societies, including the esteemed Association of Physicians of India (API).

The Global Burden of Herpes Zoster

Herpes zoster poses a significant burden on public health worldwide. The World Health Organization estimates that over 90% of individuals worldwide are infected with VZV, indicating a high susceptibility to shingles. The risk of developing shingles increases with age and/or associated comorbid immunocompromising conditions like diabetes, chronic obstructive airway disease, senility, malignancies, chronic kidney disease, solid organ transplant recipients, patients on immunomodulators, etc. The global incidence of herpes zoster is expected to rise due to the aging population. The burden of herpes zoster extends beyond the physical symptoms experienced by patients. It includes psychological distress, impaired quality of life, and substantial healthcare costs associated with the condition.

The Indian Scenario

In India, the burden of herpes zoster is substantial, with millions of cases reported each year. This becomes more relevant against the backdrop of India now being the most populous country in the world surpassing China with a very high incidence of both communicable and noncommunicable diseases. The country’s majority population, largely unvaccinated against varicella during childhood, remains susceptible to VZV reactivation in adulthood. This has led to a higher incidence of shingles compared to countries with routine childhood varicella vaccination programs. According to a study published in the Indian Journal of Dermatology, Venereology and Leprology, the incidence rate of herpes zoster in India ranges from 1.2 to 5.4/1,000 person-years. Another Indian study also revealed a higher incidence of herpes zoster in the younger population of 31–40 years (24%) and 21–30 years (19%). Moreover, factors such as underdiagnosis, lack of awareness, and limited access to healthcare services, particularly in rural areas, contribute to the increased burden of herpes zoster in India.

Complications of Shingles

Shingles can give rise to various complications, which significantly impact the health and well-being of affected individuals. PHN is one of the most common and distressing complications of shingles. It refers to persistent pain that continues beyond the resolution of the rash and can last for months or even years. PHN can have a profound impact on the quality of life, resulting in sleep disturbances, depression, and limitations in daily activities. Other complications associated with shingles include bacterial superinfection of the rash, ocular involvement leading to corneal ulcers and vision loss, cardiovascular complications like acute myocardial infarction or ischemic heart disease, arrhythmias and/or heart failure, and neurological complications such as meningitis and encephalitis. The potential severity and long-term consequences of these complications emphasize the need for effective prevention strategies.

The Need to Prevent Shingles

Prevention is a critical component in addressing the burden of herpes zoster. Vaccination plays a pivotal role in reducing the incidence and severity of shingles. The Shingrix vaccine, developed by GlaxoSmithKline, has emerged as a breakthrough in shingles prevention. It is a nonlive recombinant vaccine designed to stimulate a robust immune response against VZV. Compared to the previously available Zostavax vaccine, Shingrix offers higher efficacy and longer-lasting protection.

The Importance of Herpes Zoster Vaccination in India

- Prevention of herpes zoster: The primary benefit of herpes zoster vaccination is the prevention of the disease itself. By stimulating an immune response, the vaccine reduces the risk of reactivation of the VZV, thereby preventing the onset of herpes zoster. This is particularly crucial for individuals with weakened immune systems and those suffering from chronic illnesses, as they are at a higher risk of developing severe complications from the disease.
- Reduction in PHN: Postherpetic neuralgia (PHN), a severe and often long-lasting complication of herpes zoster, can significantly impact the quality of life of affected individuals. By reducing the incidence and severity of herpes zoster, the vaccine plays a crucial role in preventing PHN and its associated pain and discomfort.
- Cost-effectiveness: While the initial cost of vaccination may seem high, it is essential to consider the long-term cost-effectiveness of the herpes zoster vaccine. By preventing the disease and its complications, the vaccine reduces the need for medical interventions, hospitalizations, and long-term management of PHN. This results in significant cost savings for both individuals and the healthcare system.

Shingrix Vaccine and Its Composition

The Shingrix vaccine consists of a purified VZV glycoprotein E (gE) antigen along with

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an innovative adjuvant system called AS01B. The gE antigen is a key component of the VZV virus and stimulates the immune system to produce antibodies against VZV. The AS01B adjuvant is a novel adjuvant system comprising liposomes and monophosphoryl lipid A (MPL). 5

The Role of Adjuvant AS01B
The AS01B adjuvant in the Shingrix vaccine plays a crucial role in enhancing the immune response. It has been extensively studied and demonstrated to enhance vaccine immunogenicity and durability of protection. AS01B contains liposomes and MPL, which activate antigen-presenting cells, leading to a strong activation of the immune system. The adjuvant's ability to stimulate a robust immune response is particularly relevant in older adults, who typically have weaker immune systems. The inclusion of AS01B in Shingrix contributes to its superior efficacy, even in populations with diminished immune function. 5

Research on Safety and Efficacy: ZOE-50 and ZOE-70 Studies
The safety and efficacy of the Shingrix vaccine have been rigorously evaluated in clinical trials, including the ZOE-50 and ZOE-70 studies. The ZOE-50 study involved individuals aged 50 years and older, while the ZOE-70 study focused specifically on individuals aged 70 years and older. In both studies, Shingrix demonstrated remarkable efficacy in preventing shingles and its complications. In the ZOE-50 study, Shingrix exhibited an overall vaccine efficacy of 97.2% against shingles and 89.8% against PHN. Similarly, in the ZOE-70 study, the vaccine showed an efficacy of 90% against shingles and 85.1% against PHN. These findings confirm the significant protective effect of Shingrix across different age groups. 6

Recommendations by Global Medical Societies, Including the API
Global medical societies recognize the critical role of Shingrix in preventing shingles and its associated complications. The API acknowledges the burden of herpes zoster in the country and recommends the use of Shingrix in eligible individuals. The API emphasizes the importance of vaccination to reduce the incidence of shingles, especially in high-risk populations such as the elderly and immunocompromised individuals. Furthermore, the API underscores the necessity of comprehensive public awareness campaigns to educate healthcare professionals and the general population about the benefits of vaccination and the availability of Shingrix.

Conclusion
The burden of herpes zoster, encompassing the physical, psychological, and economic impact, necessitates a proactive approach to prevention. The Shingrix vaccine, with its unique composition and AS01B adjuvant system, represents a significant advancement in shingles prevention. Extensive research, including the ZOE-50 and ZOE-70 studies, has demonstrated the vaccine's safety, efficacy, and durability of protection. Global medical societies, including the API, recognize the importance of Shingrix and advocate for its integration into vaccination programs. It is incumbent upon healthcare professionals to actively promote and administer Shingrix to eligible individuals, thereby reducing the burden of herpes zoster and improving overall health outcomes. By embracing Shingrix and prioritizing prevention, healthcare professionals can play a vital role in mitigating the burden of herpes zoster and enhancing the well-being of individuals in India and worldwide.

References
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