Review Article

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Vaccination Barriers for Adults

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ABSTRACT

The growth of childhood vaccination in India has been increased over the past two decades as >25% of deaths due to infections are prevented with the help of vaccines. Vaccination is also recommended for adults where adult vaccination is mostly ignored in India. In India, childhood vaccination is considered the main priority, WHO has also issued guidelines for childhood vaccination. Generally, adults have less susceptible to traditional infectious agents but the probability of exposure to the infectious agents has increased. SO the problem of adult immunization should be considered. Vaccine-preventable diseases (VPDs) in adults are more neglected. There are many reasons for the causes of the VPDs in adults. These can be prevented by immunization among adults. Each country should provide a proper guideline for adult vaccination. When it comes to India, our country doesn't have proper guidelines for Adult immunization. As to decrease the morbidity and mortality in the life of a person the vaccine uptake for the immunization must be ensured. This article mainly focuses on the vaccine-preventable disease in India with the role of adult immunizations and the steps to ensure the betterment of the vaccine uptake among the adults.

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Introduction

Prevention of any infection is done only through immunization of individuals not only in infants but also in adults so that they can restore immunity towards some vaccine-preventable diseases (VPDs) and establish immunity against other diseases [1]. In the 21st century Vaccinations or immunization plays an important role in public health. In the fight against infectious diseases vaccination was a major breakthrough [2]. With many factors such as mutation, globalization, and increased travel the risk of infection has increased [3]. With increases in infectious diseases then vaccine-preventable diseases (VPDs) have created many problems and affect many thousands of adults. The VPDs have created high morbidity, mortality, and economic burden worldwide [4].

Childhood vaccination is considered as the priority by the government of India as well as the World Health Organization (WHO), where adult immunization is neglected. In India, adult immunization is the most ignored part of health care services [5].

Despite the availability of vaccines in the country, many adults remain unvaccinated. Many of them are unaware of the need for adult vaccines or they all are misinformed about vaccines that are designed to prevent the diseases. so, there should be more focus on adult immunization.

Burdens of Vaccines Preventable diseases in India

With high morbidity and mortality rates, the most common pneumococcal diseases, that is, meningitis and pneumonia, are associated in india [8]. To eliminate the burden of these infectious diseases immunization is the best method to adopt. Due to the successful introduction of childhood immunization VPDs have fallen dramatically over time in India. The table1 was given below as per the world population globally in 2017 India had an excessive high share of the reported cases of diphtheria with 60%, Japanese encephalitis with 44%, and tetanus with 40% in around 18% of the world's population which is not as per the age groups [9]. Along with these diseases in India 2017 around 39,000 cases of H1N1 seasonal influenza were reported by resulting in 2,270 deaths these stats were provided by National Centre for Disease Control [10]

Table1: Reported cases of selected VPDs

VPD	Earliest year in India	2017 (% of world cases)	Cases per million population (2017) in India
Polio	18,975 (1980)	0 (0%)	0
Diphtheria	39,231 (1980)	5,293 (60%)	3.95
Neonatal tetanus	11,849 (1988)	295 (13%)	0.22
Total tetanus	45,948 (1980)	4,946 (40%)	3.69
Pertussis	320,109 (1980)	23,766 (17%)	17.7
Measles	114,036 (1980)	12,032 (7%)	8.98
Rubella	1,232 (2012)	2,748 (17%)	2.05

As we are focusing more on Vaccine predictable diseases in adults, there are many diseases that people are negligent against them. Cervical cancer stands as the second leading cause of cancer death in India where 97,000 women are diagnosed and over 60,000 die from this disease each year [12]. In India from 2009–2012 random human papillomavirus HPV testing of 890 women was done and found that 12% were HPV positive and 4% were borderline positive [11]. Not only these diseases there are numerous reports of VPD bursts in India that have affected mostly in adults like Meningococcal disease, Varicella, Hepatitis A, Diphtheria, Influenza A(H1N1) pdm09, Japanese encephalitis, measles, Hepatitis B, Influenza A(H1N1), Influenza A(H3N2), Influenza A(H1N1)pdm09 [13-24].

Reasons for VDPs in Adults

For the outbreaks of VPDs, there are four main reasons why adults might be susceptible the first one is lack of adult immunization, Despite vast improvements in childhood vaccination coverage in India, adult vaccination coverage is negligible in the country and the majority of people who have good knowledge towards vaccination and screening none had received vaccination as this has happened in Bangalore in 2014 study of 155 female healthcare professionals didn't receive the HPV vaccines [26]. the second crucial factor is waning immunity where the loss of the protective antibodies against an antigen with time. When the immune response against the antigen gets low this acts as a booster dose [27]. In age-related factors, the increase the risk of VPDs can occur by various age-related conditions and/or their complications can increase the risk of VPDs and/or their complications and efficacy of some vaccines can be altered by immunosenescence [28], and the last one is the epidemiological shift of the various vaccines preventable diseases that are contracted at the childhood now are affecting the adults. An increase in vaccine coverage at the time of childhood can lead to these epidemiological shifts.

Barriers to adult vaccination

According to National Vaccine Advisory Committee [29]. there are various barriers reported to Adult vaccination. Common reasons for incomplete immunization listed below

- lack of recognition of the importance of adult immunization
- lack of recommendations from health care providers
- fear of injections
- lack of regulatory or legal requirements
- Missed opportunities for vaccination in health care providers
- lack of availability of up-to-date records and recording systems
- lack of publicly funded vaccine and reimbursement to vaccine providers
- lack of understanding of vaccine safety and efficacy

These are the few reasons for incomplete immunization in adulthood³⁰

Adult immunization mainly targets healthy young adults to young adults and the elderly it is more complex, encompassing. In table 2 there are a few diseases to which the vaccine doses are recommended to adults [3]. Vaccines recommendations are mentioned according to the diseases like human papillomavirus and meningococcal vaccines which is for adolescents and adults, few are universal recommended vaccines which are against influenza and those vaccines that are recommended only for certain age groups like herpes zoster, the vaccines which are for specific risk diseases like hepatitis A and B and for pneumococcal infections which are for particular combinations of age and risk factor

Table 2: Adult immunization Recommended schedule, by vaccines and age group

Vaccines	19–21 y	22–26 y	27–49 y	50–59 y	60–64 y	>65 y
Influenza	1 dose annually	-	-	-		
tetanus	Substitute 1-time dose of Tdap for Td booster, then boost with Td every 10 y	-	-	-		
Varicella		-	2 doses	-	-	-
HPV (Female)	3 doses through age 26 y	-	Not recommended	Not recommended	Not recommended	Not recommended
HPV (Male)	-	3 doses through age 21 y or may be through 26 y*	-	-	-	-
Zoster	Not Recommended	Not Recommended	-	-	1 dose	-
MMR	-	1 or 2 doses	-	Not Recommended	Not Recommended	Not Recommended
PPSV23	-	1 or 2 doses*	-	-	-	1 dose
PCV13	-	1 dose*	-	-	-	-
Meningococcal	-	1 or more dose*	-	-	-	-
Hepatitis A	-	2 doses*	-	-	-	-
Hepatitis B	-	3 doses*	-	-	-	-

In India, there is a lack of infrastructure for adult immunization. There are many adult vaccination recommendations where India hasn't adopted any of these and hasn't recommended any systemic programs, no funding, and did not promote any which resulted from adult immunization being neglected and underpublicized [31]. This led to over 2/3 of Indian adults that are not even aware of adult vaccination, people think that vaccines are only for children.

Challenges in Adult Vaccination

To promote lifestyles healthier throughout life by primarily preventing the obstacles to reduce alcohol consumption, smoking, obesity, sedentary behavior, and infectious disease involve healthy aging [32]. By positively impacting the population health by life-course immunization, highlighted as an essential strategy but it remains poorly implemented in the society. Age-related immune responsiveness and immunosenescence is another challenge for adult vaccination as a person's immune response to the vaccine may differ throughout life. Newborn Infants show reduced immunogenicity and they have persistence of functional antibodies (Abs), and lower cell-mediated immune (CMI) responses to vaccines when compared to the older infants, innate and adaptive immune systems subsequently increasing with evolving maturity [33]. Turning vaccines into vaccination where No matter how effective a vaccine may be, vaccine uptake should be made compulsory in public interest [34,35].

Guidelines to improve and uptake of the adult immunization

India has not established the concept of adult vaccination but in preference to vaccines, antibiotics or other treatments is being used in the country [36]. As per local guidelines in European countries, adult vaccinations were less costly than infant/childhood/adolescent vaccines [37]. Rather than using secondary preventive methods, vaccines are way better and can be low-cost. If national guidelines for adult immunizations are adopted this will take time for promoting the guidelines and the importance of adult vaccination requires considerable effort. National guidelines should create Awareness and promote the benefits of adult vaccination not only among healthcare professionals and also among the adults, new adult immunization guidelines distributed. Using the

internet as a source medium the awareness can be spread across all over the country [38], in 2009 in case of H1N1 influenza the information against this disease has given more attention through media and the internet [38]. Healthcare workers can create a huge contribution by the "4Cs" model which is increasing vaccination uptake by improving convenience, enhancing the confidence of the adults, removing complacency, and mindful of cultural acceptance [39]. These health care workers should assess their patients and encouraged their patients to routinely vaccination [40]. Ultimately the extension of vaccination in humans should be done from birth through childhood, adolescence, adulthood, and into older age [41]. Several strategies and guidelines were provided to improve the Adult immunization and adults were counseled for general immunization which include [30].

• New patient encounters
• Periodic health examinations
• Pregnancy and the immediate post-partum period
• Visits for chronic disease management
• Assessment of new immigrants
• Management protocols on admission to nursing homes, long-term care institutions, and acute care institutions
• Management protocols on admission to health professional training programs
• Persons with evidence of risk taking behaviour, such as illicit drug use or a sexually transmitted infection

Conclusion

To reduce the health consequences among the adults from vaccine-preventable diseases, adult vaccination must be made compulsory. The effective way of controlling VPDs like influenza, pneumonia, and zoster is through vaccination. Recommendations for vaccination from healthcare providers are associated with an increase in uptake of patient vaccination [42-43]. To prevent transmission of deadly diseases the adult immunization is considered as the need of the hour. The national authorities

should make the vaccines available for all and cost-effective. In resource-limited countries which are suffering from endemic, these vaccines should be easy to use and Access to Vaccine should be made increased, So that they can be easily available for each and everyone. Each and every one should be aware of vaccination programs and importance of vaccination. Social media should be used to create awareness among the people [6-44].

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