



Neonatal Immunization

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Abstract

Although vaccines have been quiet successful in reducing the large burden of serious infections. Neonates still remain quiet vulnerable to life-threatening infections. They take their greatest toll during the early stages of life. Hence various approaches are required to protect them. Here we review the rationale, current state, and research for such approach i.e neonatal immunization. There are many challenges to neonatal immunization. Few of them include concern regarding the safety of the vaccine and distinct neonatal immune system (vaccines which are effective in adults are not effective in new borns). Despite distinct neonatal immunity, there are several vaccines which have proven safe and effective at birth. However neonatal immunization at birth is quiet a reliable point of healthcare contact, so is an opportunity for early protection of neonates against diseases, including preterms which are deficient in passively transferred maternal antibodies. While some vaccines such as polysaccharide vaccines have little effectiveness at birth, hepatitis B vaccine can prime at birth and requires multiple doses to achieve protection, contrary to the BCG vaccine which, offers single shot protection.

Keywords: Neonatal; Vaccine; Protection; Immunity

Introduction

Many of the deaths in less than five years are cause to diseases against which vaccines are available. These diseases occur before the protection is provided by routine vaccination. Which usually starts at 6 - 8 weeks of age, as single shot usually is not effective in providing protection, hence repeated doses are required. Hence to reduce the under five mortality a number of strategies are being explored and implemented. We rely on immunization during the early years of life, along with our understanding of neonatal immune responses [1-6]. This has led to keen interest in neonatal immunization. Development in the field of immunization over the past century has led to the discovery of large number of effective vaccines being given at early stages of life. Usually only three vaccines are given at birth which are Bacille Calmette-Guérin (BCG), hepatitis B (HBV), and polio vaccine [oral polio vaccine (OPV); or inactivated polio vaccine (IPV)]. Hence neonatal immunization is a hot topic for future research. Neonatal vaccines are defined as those given "at birth" or within 28 days of life. And infant vaccines given after one month of life. Neonatal vaccines must take into account some limitations, like (a) safety, (b) lack of effectiveness in early life, (c) blunting of neonatal antibody responses because of maternal immunization. However, the rationale for neonatal im-

munization is quiet logical as it protects from the burden of early life infections and birth of a child is a potential point of contact with health care facility and pairing immunization with birth is beneficial for both mother and child. Over and above immunization at birth can provide earlier protection. And even protection of preterms for whom maternal antibody transfer was limited. It is evidenced that the benefits of the live-attenuated BCG and other live vaccines is best in early life [7,8]. Review of literature has mentioned that both cellular and antibody mediated immune systems are distinct at birth [9,10]. Neonatal immunity given by vaccines should not only protect the new born against pathogens, but also help in colonizing of microbes. Cellular immunity in the newborn has reduced Th1 response but high anti-inflammatory IL-10 responses. It has high frequency of regulatory-T cells and CD71+ erythroid precursors that limit, responses to pertussis immunization [10,12,13]. Whereas neonatal immunity mounts antigen-specific responses, as seen in BCG vaccination at birth [14,15].

Conclusion

However, detailed study of age-specific immunity may help in formulation of vaccines. It is a universal practice to protect new borns against potential life threatening diseases right from birth, yet robust and potential steps and measures are to optimize its benefits and its vast coverage.

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