Nearing elimination of meningitis A from the African “meningitis belt” using meningococcal A conjugate vaccine

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Meningococcal meningitis is a serious infection accounting for deaths and disability among thousands of young people every year.¹ Multiple incidences of severe epidemics of meningococcal meningitis have been reported in Nigeria in 1996 (109,580 cases) and in Niger in 2009.^{2,3} Even though cases of meningococcal meningitis have been reported across the world, a large number of recurring epidemics have primarily been reported in the 26 nations of the sub-Saharan Africa region, also known as the “meningitis belt”.^{1,4}

In order to control the outbreaks of meningococcal meningitis, three types of vaccines have been used, namely polysaccharide vaccines (bivalent, trivalent, tetravalent), vaccine against NmB, and conjugate vaccines against group C.¹ However, due to the various limitations (viz. useful only after the onset of an epidemic, no protection for infants, no impact on disease transmission, offering only short-term protection,

etc.) associated with the previous vaccines, the World Health Organization in collaboration with other international stakeholders has approved the administration of meningococcal A conjugate vaccine (MACV), which can be used for infants also in the sub-Saharan Africa region.^{4,5} The previous vaccines are still in use in other parts of the world depending on the type of meningococcal strain isolated in each specific region.¹

Acknowledging the high case load, higher incidence rate and/or case fatality rate, the enormous burden on individuals, families, society, and healthcare systems, in an attempt to counter the disease successfully, MACV was launched initially in Burkina Faso in the year 2010, and was subsequently introduced in the other nations from the meningitis belt.^{6,7} Until the end of June 2015, almost 220 million persons in the age-group of 1-29 years have received MACV in 15 nations of the African belt.¹

The results of the introduction of MACV have been hugely successful; a drastic reduction in the number of suspected cases of *Neisseria meningitidis* A infection, and associated deaths have been reported since then.^{2,4} In fact, before the introduction of MACV in 2010, group A meningococci accounted for almost 80% of all cases in the meningitis belt, while in 2014, only 11,900 suspected cases and less than 1,150 deaths have been reported, which are the lowest estimates since the year 2004.¹ Further, in the year 2013, only 4 laboratory-confirmed cases of meningitis A were reported in the region, and it has been anticipated that owing to the high coverage of MACV in the age-group of 1-29 years, the epidemics of subtype-A meningococci will be soon eliminated from the entire meningitis belt.^{4,6}

The MACV has been even successful in interrupting the chain of transmission, providing long-term protection, and was subsequently cleared for administration worldwide in the early

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part of 2015.^{5,8} In addition, an almost one-fourth reduction in the proportion of cases of children infected with tetanus has also been observed as the MACV tends to boost the protective immune response against tetanus.^{4,5} However, even now, some of the nations from the meningitis belt have not completely expanded the administration of MACV across all settings.¹

Further, it is very important to understand that all the accomplished gains will be neutralized unless the affected nations maintain a high level of vaccine coverage by integrating the MACV into the routine childhood immunization schedule.^{4,9} At the same time, a gradual increase in the number of meningitis cases due to other serogroups of *Neisseria meningitidis* and due to *Streptococcus pneumoniae* has been observed in the African meningitis belt in the 2013 epidemic season.⁴ This calls for a modification in the existing outbreak response strategy, to ensure prompt detection of cases and outbreaks through enhanced surveillance, appropriate case management through administration of antibiotics, early immunization of populations with subtype-specific vaccines, and administration of MACV on a massive scale.^{1,4,5,9,10}

To conclude, the introduction of the meningococcal A conjugate vaccine has cleared the way for the elimination of meningitis-A from the entire meningitis belt. However, for sustaining the achieved gains and expanding the benefits to other regions of the world, the vaccine has to be integrated in the routine immunization schedule.

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