

# Commencement of the Meningococcal Vaccination for the Republic of Korea Army

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On December 11, 2012, the Korean military authorities made an official announcement that all recruits will receive a quadrivalent (group A, C, Y, and W-135) meningococcal conjugate vaccine (Menveo<sup>®</sup>, Novartis Vaccines and Diagnostics, Cambridge, MA, USA) which commenced on November 17, 2012 [1]. The meningococcal outbreak at the Nonsan Recruit Training Center in April 2011 raised public awareness of the need for a meningococcal vaccination for the Republic of Korea Army (ROKA). Although the outbreak of 2011 became a huge social concern promoted by mass media, patients were consistently diagnosed with meningococcal diseases in the ROKA for a long time. Serving as a medical officer at the Armed Forces Capital Hospital, I experienced 12 cases of meningococcal meningitis or septicemia from August 2000 to July 2001 and two of them died within 12 hours after admission [2]. Meningococcal disease is the most frightening infectious disease I have ever experienced.

Invasive meningococcal disease is one of the most severe vaccine-preventable diseases [3]. The effectiveness of primary prevention through vaccination is clearly illustrated by the successful introduction of the meningococcal serogroup C conjugate vaccine in Europe. Following the introduction of the conjugate vaccine in the UK, there was a 93% reduction in

serogroup C disease [4] and 81% reduction in carriage which was considered consistent with herd immunity [5].

Age groups at high risk for developing meningococcal diseases are infants, adolescents, and young adults. Moreover, military recruits are at the highest risk, due to numerous risk factors they encounter, such as age, diverse geographic background, and crowded living conditions [6]. In the US Army, beginning in October 1971, all new recruits were vaccinated with the serogroup C vaccine, and by Fall 1982, all recruits received quadrivalent polysaccharide vaccines [6]. However, in the ROKA, the vaccination of recruits has only commenced starting in November 2012 [1].

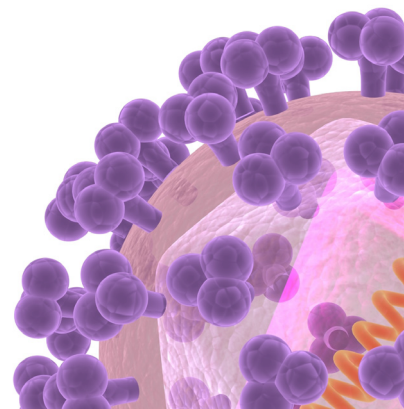
Generally, a preventive strategy is instituted for two reasons. First, preventive tactics can be usefully employed against certain diseases with extremely high incidence, despite their low morbidity and mortality. For instance, the incidence of *Plasmodium vivax* malaria cases exhibited an exponential growth since its re-emergence in 1993 until 2000 (4,142 cases) along the demilitarized zone. The ROKA instituted the mass chemoprophylaxis program in 1997 and not a single mortality case has been reported since. The program was expanded annually from approximately 16,000 soldiers in 1997 to more than 140,000 soldiers in 2002 [7]. The second indication for

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the use of a preventive strategy is when the course of the disease is expected to be fatal, regardless of its low incidence. Hence, meningococcal diseases and Hantaan virus infection (hemorrhagic fever with renal syndrome) are good examples of such.

The vaccination against Hantaan virus (Hantavax<sup>®</sup>, Green Cross, Seoul, Korea) has kept being implemented for a long time, even until this moment. However, why did the ROKA introduce the meningococcal vaccine so late? To my knowledge, the most plausible cause is due to economic concerns. Menveo<sup>®</sup> was auctioned off at 44,066 Korean won (KRW) a dose [8]. For the necessary 300,000 annual doses, it would have cost the ROK about 13 billion KRW. Is this annual cost really too expensive for 'just' two cases of death by a meningococcal disease? There was a similar debate for college freshmen living in dormitories throughout the late 1990s in the US. On one hand, authorities insisted that vaccination of college students is unlikely to be cost-effective [6, 9], but on the other hand, they also acknowledged that it is not just an issue of cost-effectiveness [10]. A cost analysis suggests that, from a societal perspective, vaccination of college students is not likely to be cost-effective. However, it does not take into account the personal tragedy of families that experience the loss of children; the consequences of severe sequelae, such as loss of a limb, neurologic disabilities, and hearing loss; public anxiety; and disruption of social life after the occurrence of one or more cases of severe meningococcal diseases [10]. College freshmen are similarly exposed to the risk factors seen in military recruits for meningococcal diseases [6]. The annual incidence in the ROKA was estimated as nearly the same as that of the dormitory residents of US colleges [2]. Still, do you think the price is too high for your son? I have two sons and they will be conscripted into the Army within several years. I cannot put a price on my sons.

Some physicians have made a counterargument against the introduction of the meningococcal vaccination in the ROKA because they insist that vaccinations against hepatitis A and influenza viruses are much more urgent than that of meningococcal vaccinations [11]. Here are some reasons why I cannot agree with these physicians. All recruits that were conscripted into the ROKA from November to March of every year have already received the influenza vaccination [12]. In addition, hepatitis A is the most prevalent among all young adults, even in those who are not serving as military recruits. Therefore, a different preventive strategy for hepatitis A should be employed from that of meningococcal diseases. In terms of the public health, hepatitis A vaccination should be included in the National Mandatory Immunization Program.

About twelve years ago, I had to let go of four dead soldiers who suffered from meningococcal diseases, including two previously reported deaths [2]. I was deeply saddened and frustrated to lose them before any action could be taken. At that time, I promised them and myself that I would do my best to introduce the meningococcal vaccination to the ROKA. Twelve years later, I now stand behind my own promise for those four young spirits. With my sincere condolences, I would like to say to my soldiers, "Seo, Park, Cho, and Kim, please rest in peace".

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