

Editorial



Vaccines of Our Own



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► See the article "A Phase III Study to Evaluate the Immunogenicity and Safety of GC1107 (Adult Tetanus Diphtheria Vaccine) in Healthy Adults" in volume 34, e31.

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In the present issue, Lee et al.¹ conducted a non-inferiority study comparing GC1107 (tetanus diphtheria [Td] vaccine) developed in Korea with the existing Td-Pur (GlaxoSmithKline, London, UK), and concluded that there was no significant difference in immunogenicity and safety. Because tetanus is a disease that one cannot obtain natural immunity, it must be prevented by vaccination.

Tetanus has been a mandatory vaccination since the first inception of diphtheria-tetanus-pertussis to the Korean national immunization program (NIP) in 1958. As a result, according to the data from Korea Centers for Disease Control as of 2017, there is a successful high coverage rate of over 90% in all children under 3 years of age.² Due to this successful vaccination rate, the incidence of tetanus in Korea has decreased significantly.

In other countries, tetanus occurs mainly in the elderly, whereas in Korea, it occurs mainly in younger individuals. The reason for this is thought to be that antibody titer declines 10 years after the vaccination in childhood but the re-immunization rate in young adults is not high in Korea.³

A recent survey of tetanus seroprevalence suggests that 70.4% of adults over the age of 11 need a booster.⁴ Therefore, among Korean adults, there is still a high proportion of subjects who need to get tetanus vaccine again. According to Korean Society of Infectious Diseases' 2012 Adult Immunization Guidelines, it is recommended to vaccinate with tetanus, diphtheria, and acellular pertussis from 19 years old and booster with Td every 10 years.⁵ Therefore, the importance of adult Td is expected to be significant in the future.

The study by Lee et al.¹ showed that the Td developed by pure domestic technology, not foreign imports, is comparable in terms of immunogenicity. Developing a vaccine with our own technology has important implications. The history of vaccination in Korea begins with the principle of vaccination (small pox) led by Seok-Young Jee in 1882. In 1949, the Korean government launched 18 vaccines, including diphtheria, tetanus, cholera, and Japanese encephalitis. Since the 1970s, private pharmaceutical companies have also been able to supply vaccines, thereby providing synergy benefits to the NIP.

Unlike pharmaceuticals in other sectors, vaccines are limited to a small number of market suppliers. This is because technological barriers are high and initial investment costs are huge

in production and distribution, but net profits are relatively low and there is a limit to market expansion. Today, global vaccine markets are virtually monopolized by five global pharmaceutical companies. In Korea, a large number of vaccines have been dependent on imports from foreign countries. If we have a large dependency on imports, we may have a delay in vaccination and an increase in vaccine prices due to the time it takes to import. Therefore, government support is essential to develop vaccines in Korea. As of 2018, the Korean government has provided support for 38 items from 10 institutions.^{6,7} The securing of the vaccine initiative is very important because it is related to social services to support the vulnerable.

Since 2009, swine flu pandemic has enabled the production of influenza vaccine in Korea. As a result, the scope of the vaccine has been gradually expanded and the supplying amount of vaccine has been gradually increasing.

Currently, there are 57 kinds of vaccines distributed in Korea, 15 of which are manufactured and sold by 13 manufacturing and importing companies. The global vaccine market grew from US\$ 35.2 billion in 2012 to US\$ 52.1 billion in 2016, while the Korean vaccine market is growing from USD\$ 360 million in 2012 to USD\$ 496 million in 2016.^{6,7} Currently, the development of Korean vaccines is predominantly focused on flu vaccines, but is expanding to other vaccines. To date, vaccines developed in Korea include not only for influenza, but also hepatitis B vaccine, Td, varicella vaccine, hemorrhagic fever with renal syndrome vaccine, and *Haemophilus influenzae* type B vaccine.⁶ Today, the vaccine market is constantly changing, including the development of mixed vaccines, the development of new vaccines due to the emergence of new infectious diseases, and the change of vaccine formulations. The Korean government is actively supporting the plan to further strengthen various preemptive support in order to raise vaccine self-sufficiency rate from 50% in 2018 to 80% in 2022 in the future.^{6,7} Government support and constant development of vaccines by Korean pharmaceutical companies are expected to broaden the scope of vaccines in the near future and contribute to the successful implementation of NIP.

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