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Editorial

Advancing Familial Hypercholesterolemia Detection and Management in South Korea

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▸ See the article "Enhancing Familial Hypercholesterolemia Detection in South Korea: A Targeted Screening Approach Integrating National Program and Genetic Cascade Screening" in volume 54 on page 726.

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Familial hypercholesterolemia (FH) is a genetic disorder characterized by elevated levels of low-density lipoprotein cholesterol (LDL-C), which significantly increases the risk of premature cardiovascular disease (CVD). Despite its severity and prevalence, FH is often underdiagnosed worldwide, including in South Korea.[1] This editorial reviews the current state of FH detection in South Korea, identifies gaps in the screening process, and advocates for the implementation of a structured national cascade screening program.

THE CHALLENGE OF UNDIAGNOSED FAMILIAL HYPERCHOLESTEROLEMIA IN SOUTH KOREA

FH is an autosomal dominant disorder primarily caused by mutations in the *LDLR*, *APOB*, and *PCSK9* genes.[2] These mutations disrupt normal cholesterol metabolism, resulting in high LDL-C levels. The global prevalence of FH is estimated to be approximately 1 in 200 to 1 in 250 individuals,[3][4] suggesting that a significant number of Koreans could be affected. However, the actual diagnosis rate remains alarmingly low due to several barriers, including the high cost of genetic testing, insufficient awareness among healthcare providers and the general population, and limited screening strategies.

In South Korea, FH diagnosis typically relies on the Dutch Lipid Clinic Network and Simon Broome criteria, which assess family history, clinical features, LDL-C levels, and genetic testing.[5] However, many cases go undetected due to the phenotypic variability of FH and the absence of systematic genetic screening protocols. While the national General Health Screening Program (GHSP) mandates LDL-C testing every 4 years for individuals aged 20 and older, providing an opportunity for early detection of severe hypercholesterolemia,[6] this program alone is insufficient for the comprehensive identification of FH.

INTEGRATING CASCADE SCREENING

Cascade screening, which involves testing relatives of diagnosed individuals, is a proven strategy for identifying cases of FH.[7] This approach is cost-effective and can significantly increase detection rates by leveraging familial connections. A study by Yang et al.[8]

The contents of the report are the author's own views and do not necessarily reflect the views of the *Korean Circulation Journal*.

demonstrates the potential of integrating the GHSP with cascade genetic screening to improve FH detection in South Korea. Their method involved analyzing individuals with high LDL-C levels identified through the GHSP and confirming pathogenic mutations through genetic testing. The study found that 8.4% of individuals with severe hypercholesterolemia carried pathogenic mutations, and 61.1% of their screened relatives also had FH-associated mutations.

This model underscores the effectiveness of targeted screening strategies and establishes a precedent for implementing a national cascade screening program. By systematically testing first-degree relatives of diagnosed FH individuals, early detection rates can be significantly improved, enabling timely intervention and reducing the burden of CVD associated with FH.

ADDRESSING THE GAPS

Despite the promising results of targeted screening, several challenges must be addressed to successfully implement a national cascade screening program in South Korea.

1. Increasing awareness: Raising awareness about FH and the importance of genetic screening among healthcare providers and the public is crucial. Educational campaigns and training programs can help achieve this goal.
2. Reducing costs: The high cost of genetic testing poses a significant barrier to widespread screening. Subsidizing these tests or incorporating them into national health insurance schemes can make them more accessible.
3. Developing infrastructure: A robust infrastructure for genetic testing and counseling is essential. This includes setting up regional centers equipped with the necessary technology and expertise to conduct genetic tests and provide follow-up care.
4. Standardizing protocols: Developing standardized protocols for cascade screening will ensure consistency and accuracy in detecting FH. This includes clear guidelines for identifying probands and systematically testing their relatives.
5. Overcoming cultural barriers: Cultural sensitivities and stigma associated with genetic conditions can hinder the acceptance of cascade screening. Addressing these issues through culturally sensitive communication and support services is vital.

By addressing these challenges, we can establish a more effective and comprehensive FH detection and management program, ultimately improving health outcomes for those affected by this condition.

INSIGHTS FROM INTERNATIONAL EXPERIENCES

The international landscape offers valuable insights into the implementation of FH screening programs. Evidence shows that genetic testing and cascade screening can significantly enhance the detection and management of FH. For instance, the Netherlands and Norway have successfully implemented national cascade screening programs, leading to increased diagnosis rates and improved clinical outcomes.[9]

An expert panel has highlighted the importance of genetic testing for FH, recommending it as the standard of care for individuals with definite or probable FH, as well as for their at-risk relatives.[10] This approach facilitates early diagnosis, more effective cascade testing, earlier initiation of therapies, and more accurate risk stratification.

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These international experiences suggest that South Korea can develop and implement a more effective FH screening program, thereby improving early detection and management of the condition.

THE ROLE OF CASCADE SCREENING IN FUTURE STRATEGIES

Cascade screening provides a promising solution to address the underdiagnosis of FH. By leveraging the existing GHSP framework and integrating genetic testing, South Korea can develop a comprehensive and systematic approach to FH detection. This strategy aligns with global best practices and optimizes local healthcare resources for maximum impact.

Implementing a national cascade screening program can transform FH management. Early detection and intervention are crucial for preventing the severe cardiometabolic consequences associated with FH. A structured approach can improve the quality of life for individuals with FH and reduce the overall burden of CVD.

CONCLUSION

FH is a critical public health issue that demands immediate action in South Korea. Addressing its underdiagnosis can be achieved through a systematic, nationwide cascade screening program based on the GHSP framework. By focusing on raising awareness, reducing costs, developing infrastructure, standardizing protocols, and overcoming cultural barriers, we can significantly enhance the detection and management of FH. Collaboration among healthcare providers, policymakers, and the public is essential for implementing this strategy and securing a healthier future for the population.

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