

Available online at www.sciencedirect.com

SciVerse ScienceDirect

journal homepage: <http://www.e-biomedicine.com>

Editorial

Rare diseases: A mysterious puzzle

Although often affecting only a small population, most rare diseases are genetic and hence afflict the patient throughout life. Personalized medicine is based on a principle that each individual is born with unique biological characteristics. Genomics lays the foundation of personalized medicine, the success of which depends on accurate diagnostic tests capable of identifying patients who can benefit from targeted therapy.

Kawasaki disease (KD) is an acute, self-limited, and systemic vasculitis that is a prime cause of acquired heart disease in children. To date, human leukocyte antigen (HLA) genes within the major histocompatibility complex region on chromosome 6p remain the best documented association for KD. Other non-HLA candidate genes in this region, such as those genes located in the psoriasis susceptibility 1 (PSORS1) region, play potential roles in developing KD. In a study in this issue [1], a single nucleotide polymorphism was identified in the PSORS1 region that contributes to KD susceptibility in Taiwanese children of Han Chinese ethnicity. A strong correlation between PSORS1C1 gene polymorphism and cardiac artery aneurysm in KD patients was observed.

Pediatric obesity looms ever more prevalent and has a major impact on public health. A complication of childhood obesity, acanthosis nigricans (AN), is associated with obesity as a manifestation of cutaneous insulin resistance. Clinical observation plus a pioneer genetic approach revealed association of the insulin/insulin-like growth factor receptor pathway with pre-obese and co-obese AN. Insulin resistance caused by AN might result in failure of suppression of excessive energy intake with ensuing obesity. This study forges a link in complex pathogenesis of obesity under scrutiny of patients' phenotype and genotype association.

Gilles de la Tourette syndrome (TS) is a neuropsychiatric disorder characterized by both motor and vocal tics. Pathogenesis remains obscure; current evidence points to a defective dopamine system. Single nucleotide polymorphisms serve as a tool to study complex gene-associated diseases like TS. In this genetic study, dopamine transporter and dopamine β -hydroxylase genes may not be useful as markers to predict susceptibility to TS, whose etiology is therefore unknown. Childhood TS may involve complex interaction between environmental influences. Further studies must confirm these assertions.

Parkinson's disease (PD) is characterized by progressive neuronal cell loss and decline in movement. β -Glucosidase

(GBA), an enzyme deficient in Gaucher's disease, has been linked with PD. GBA mutation was shown in a study in this issue to be associated with PD patients in Central Taiwan. The connection between mutant GBA and parkinsonism remains unclear, therefore, a future study must identify the pathological mechanism. The aforementioned study implicates the mutation as a genetic risk factor in sporadic PD, accounting for higher prevalence of the disease in allele frequencies.

An example of the role of genetic and environmental factors in etiology is birth defects. This issue probes seasonal variation in respiratory defects and Down syndrome in Norway: namely, in March and February, respectively. Further studies must explain such variations, which likely represent environmental causes.

Pathogenesis of rare diseases is too complex to ferret out a common mechanism; etiology entails a gamut of genetic and environmental factors. Fundamental data to profile risk factors and discover novel therapeutic targets are vital. Tailoring therapy based on pharmacogenomic tests may save lives and bolster patient care. A challenge to healthcare teams is to consider how new genomic information affects management decisions and ensure personalized medical care.

REFERENCES

- [1] Lin WY, Liu HP, Chang JS, Lin YJ, Wan L, Chen SY, et al. Genetic variations within PSORS1 region affect Kawasaki disease development and coronary artery aneurysm formation. *BioMedicine* 2013;3:73–81.

Fuu-Jen Tsai

China Medical University, 91 Hsueh-Shin Road, Taichung City, Taiwan

E-mail address: d0704@mail.cmuh.org.tw

Available online 31 May 2013

2211-8020/\$ – see front matter

Copyright © 2013, China Medical University. Published by Elsevier Taiwan LLC. All rights reserved.

<http://dx.doi.org/10.1016/j.biomed.2013.04.004>