The Shanghai Clinical Center for Endocrine and Metabolic Diseases

A Wealth of Research from China for the World and Metabolic Diseases

Founded in 1950 by a team of four doctors, the Shanghai Clinical Center for Endocrine and Metabolic Diseases was one of the earliest endocrine and metabolic disease units in China. It has grown to become the most important clinical, research, and education center in the field of endocrine and metabolic diseases in the country, and it is affiliated with the Comprehensive Health Care Center of the Shanghai Medical College and School of Medicine of Fudan University. The center is the only National Glycohemoglobin Standardization Program (NGSP) certified and College of American Pathologists (CAP) accredited clinical laboratory for endocrine and metabolic diseases in China.

Key Research Areas

CCCEMD is pioneering both basic and translational science, housing research teams dedicated to studying endocrine tumors, diabetes, and obesity, among other areas.

Endocrine System Research

Established in the 1960s, the adrenal gland disease study group reported the very first primary aldosteronism (PA) patient in China. Today, the center holds the largest collection of adrenal tumors in China and leads a nationwide cross-sectional survey on the prevalence of PA in resistant hypertension patients in China. In addition to PA, the adrenal gland disease study group has been focusing on phaeochromocytomas, Cushing syndrome, endocrine-related hypertension, and hypokalemia.

The thyroid research team, meanwhile, studies the most common diseases affecting the thyroid. Specific areas of investigation include elucidating genetic and environmental factors and immunity pathways involved in autoimmune thyroid disease, identifying molecular biomarkers for improving the diagnosis and prognosis of thyroid cancer, and ultimately discovering new therapies for treating thyroid diseases.

Diabetes

“The prevalence of metabolic diseases such as diabetes is growing very fast in China,” says Ning. “We must look for the best ways to prevent and treat diabetes, both so it is effective and so that the cost of treatment can be lowered and rolled out across China.”

CCCEMD research groups are conducting major studies on the molecular mechanisms of pancreatic beta cell expansion and compensation in response to different stimuli to find a remedy for beta cell loss in type 2 diabetes.

Obesity

With obesity rising dramatically in China, CCCEMD is exploring novel causal genes, molecular mechanisms, prevention, and therapies. In 2009, the Genetics of Obesity in Chinese Youth (GOYC) study was established with the goal of exploring the pathways involved in obesity and genetic susceptibility of patients with obesity. This cohort study has enrolled over 1,000 patients with obesity and 1,000 control subjects, and is registered on the U.S. ClinicalTrials.gov website.

The center was one of the first to investigate the causal role of obesity in cardiovascular disease using the principle of Mendelian randomization, a way of ensuring that any observed difference in the outcome is because of the genetic variant being studied. CCCEMD researchers are using whole-exome sequencing to identify novel rare genetic variants in the human genome as well as metagenomics to investigate our “other genome”—the collective genome of the microorganisms inhabiting our body, known as the microbiome.

The obesity study group also conducts basic studies that examine the molecular mechanisms underlying obesity, energy balance, including which genes regulate adipocyte (fat cell) differentiation, and investigate how bariatric (weight loss) surgery alters the microbiome and neural pathways. They believe that a better understanding of these processes will pave the way for developing new drugs to combat the obesity epidemic.

Prevalence of Diabetes Among Adults in China

One of the major focuses of CCCEMD is conducting massive cohort studies, which are of fundamental importance to new discoveries within translational medicine.

“We not only focus on the basic understanding of diseases, but also put the results back into our clinical work,” says Ning. “Many labs in the U.S. are like this, but our center is the only one in China.”

“We have several huge cohort studies on type 2 diabetes and endocrine tumors, each with a large number of research subjects,” he explains, “and we are keen to share our findings with researchers across the world.”

CCCEMD has conducted three major epidemiological studies in the last five years. In June 2008, 46,000 participants were recruited as part of the Shanghai Community Metabolic Diseases Survey investigating the influence of urbanization on the prognoses of metabolic diseases in subjects over the age of 40. The 2010 China Noncommunicable Disease Surveillance study was set up to assess and monitor the prevalence of and risk factors for noncommunicable diseases in Chinese adults. The team recruited 98,658 participants, with an average age of 18 to 65 across mainland China and has recently published a paper based on the survey’s findings in the Journal of the American Medical Association.

A third noteworthy study is the Risk Evaluation of Atherosclerosis in Chinese Diabetes: Individuals’ 1:09Genital study (REACTION). Set up in 2011, the multicenter prospective cohort recruited a total of 259,657 individuals aged 40 and over from 25 research centers and will follow up with them every five years.

As part of the large Shanghai Community Metabolic Diseases Survey, the center created an additional prospective cohort to study whether high-fructose corn syrup (HFCS) exposure affects human health. In 2009, CCCEMD recruited 3,471 middle-aged and elderly subjects and followed them for four years. The cross-sectional analysis revealed a significant association between HFCS-exposure levels and the prevalence of metabolic disorders, including diabetes, obesity, and thyroid dysfunctions.

Clinical Studies

Adipose Tissue

Oxylipide for treating diabetes and are creating a storage bank of TCM molecular ingredients and exploring ways to incorporate these into treatment regimens.

Molecular mechanisms underling metabolic disorders in the liver, in particular the function of nuclear receptors and adaptor proteins in the pathogenesis of nonalcoholic fatty liver disease and insulin resistance.

Traditional Chinese medicine (TCM) has long been used in diabetes treatment in China, and the center has been driving TCM experiments since the 1980s. CCEMD scientists have found evidence supporting the benefits of ingredients such as berberine, Panax ginseng, and andrographolide for treating diabetes and are creating a storage bank of TCM molecular ingredients and exploring ways to incorporate these into treatment regimens.

Patient Statistics

• 280,000 out-patient consultations
• 62,000 in-patient consultations (12 specialized disease clinics every week)
• 5,210 in-patient consultations
• 19 clinical trials

2013 Data

http://english.shsmu.edu.cn
Journal of Diabetes (JDB) devotes itself to diabetes research, therapeutics, and education. It aims to involve researchers and practitioners in a dialogue between East and West via all aspects of epidemiology, etiology, pathogenesis, management, complications and prevention of diabetes, including the molecular, biochemical, and physiological aspects of diabetes. The journal has established a specific “Asia Track” to further this endeavor by bringing to the international community articles which focus on aspects of diabetes of particular relevance to Asia. The Editorial team is international with a unique mix of Asian and Western participation.

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