【Grant-in-Aid for Scientific Research (S)】
Biological Sciences (Medicine, Dentistry, and Pharmacy)

Title of Project Achievement of Highly Accurate Diagnosis of Early Pancreatic Cancer in Japanese Patients through a Comprehensive/Integrated Approach

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Research Area: Medical, Dental, and Pharmaceutical
Keywords: Pancreatic surgery

【Purpose and Background of the Research】

Gastrointestinal cancers account for 65% of the cancer deaths in Japanese patients, and pancreatic cancer is the most refractory among gastrointestinal cancers. However, its 5-year survival rate is 69% if it is diagnosed in the early stage of the disease. As is clear from these data, early diagnosis is extremely important in improving the treatment outcome in patients with pancreatic cancer, thus making early diagnosis through the development of novel biomarkers and appropriate medical interventions critical. In practical situations, however, conducting studies in patients with early pancreatic cancer is challenging because the number of patients is extremely small. Therefore, cases with clinically nonmetastatic early stage pancreatic cancer are strategically and systematically collected to analyze their data with high accuracy in the All-Japan System.

【Research Methods】

To develop novel biomarkers for the highly accurate diagnosis of early pancreatic cancer with sensitivity and specificity exceeding those of the current medical technology, it is important to collect Japanese samples (tumor [T] factor = blood/saliva [and tumor whenever possible] from patients with early pancreatic cancer) across the nation within a given time frame as much as possible and to obtain a complete, integrated understanding by examining the (T) factor together with environmental (E) factors and genetic background (P) as the trinity. We aim to elucidate the individual causal association over 5 years and to apply these results to develop a system for intellectual property maintenance, improve industrial infrastructure, widely conduct awareness programs among citizens, and deliver medical services.

【Expected Research Achievements and Scientific Significance】

(1) Pancreatic cancer often has a poor prognosis; thus, overcoming this disease can be a persistent desire of citizens. Early diagnosis is extremely important. (2) Early pancreatic cancer has been difficult to study. Establishment of a strategic research organization supported by the All-Japan System is essential to promote comprehensive development projects for problem-solving in order to achieve an early diagnosis. (3) This study is a strategic analysis specialized for the diagnosis of early pancreatic cancer based on a previous triune fusion-type study on colorectal and esophageal cancers. The (P) factor is expected to reduce development cost, while high quality is maintained by adding the (E) factor after confirming/utilizing information from genome-wide association studies. A triune fusion-type study (P + E + T) is conducted by collecting samples from patients with early pancreatic cancer (T factor) across the country.
(4) This will be the first ever study in the world to conduct research on early pancreatic cancer by considering 3 factors in combination. (5) The importance of miRNA/exosomes in peripheral blood and cancer metabolites has received interdisciplinary attention.

Fundamental information that will help identify patients in the high-risk group (P and E factors), avoid high-risk habits (P and E factors), early diagnosis when examining pancreatitis or other diseases (P, E, and T factors), and create awareness programs for citizens for their appropriate understanding of the disease by providing consultations on inheritance to family members will be obtained. Thereby, a more accurate treatment strategy than the current one can be established.

【Publications Relevant to the Project】

・Egawa, S. et al. ***Pancreas***, 41(7):985-992, 2012.

【Term of Project】 FY2015-FY2019

【Budget Allocation】 JPY 153,800 Thousand Yen

【Homepage Address and Other Contact Information】

http://www.med.osaka-u.ac.jp/pub/gesurg/