Current Status and Efforts of Cancer Genomic Medicine at Fukuoka University Hospital: As the Cancer Genomic Medicine Coordinator

Yoshimi JOKO[1], Kumiko OHKUBO[2,3], Toshihiro TANAKA[4],
Yoichiro YOSHIDA[5], Hiroyuki INOUE[6], Teppei YAMADA[5],
Hiroshi MATSUZAKI[7], Masamitsu KURAKAZU[2,8], Makoto HAMASAKI[9],
Kazuki NABESHIMA[9], Yasushi TAKAMATSU[1,4]

1) *Fukuoka University Cancer Center*
2) *The Genetic Counselling Clinic, Fukuoka University Hospital*
3) *Department of Laboratory Medicine, Faculty of Medicine, Fukuoka University*
4) *Division of Medical Oncology, Hematology and Infectious Diseases, Faculty of Medicine, Fukuoka University*
5) *Department of Gastroenterological Surgery, Faculty of Medicine, Fukuoka University*
6) *Department of Respiratory Medicine, Fukuoka University Hospital*
7) *Department of Urology, Faculty of Medicine, Fukuoka University*
8) *Department of Obstetrics and Gynecology, Faculty of Medicine, Fukuoka University*
9) *Department of Pathology, Faculty of Medicine, Fukuoka University*

Abstract

Since June 2019, cancer genomic profiling (CGP) tests have been reimbursed by the National Health Insurance system in Japan. Fukuoka University Hospital has been conducting CGP tests as a cancer genomic medical cooperation hospital in collaboration with Kyushu University Hospital, which is a core base hospital with a molecular tumor board composed of multidisciplinary specialists, known as an expert panel. Based on evaluations conducted from October 2019 to August 2021, we herein report the current status of and assess issues encountered thus far concerning cancer genomic medicine. From October 2019 to August 2021, 62 patients underwent CGP tests, with a median age of 58 (3-81) years old (34 males, 28 females). The quality status of tissue samples was analyzable in 57 cases (92%) and inadequate for an analysis in 5 cases (8%) due to a poor DNA quality (3 cases) or insufficient DNA yield (2 cases). The average number of monthly inspections was two in the first year but gradually increased to nine in August 2021. The number of evaluations performed for each organ was 13 for lung, 10 for small and large intestine, 10 for stomach/esophagus, 8 for soft tissue, 7 for mammary gland, 6 for prostate, 5 for brain/nerves, 1 for adrenal gland, and 2 for others. The clinical departments were gastrointestinal surgery in 20 cases, oncology in 16 cases, respiratory medicine in 13 cases, renal urology surgery in 7 cases, and pediatrics in 6 cases. TP53 was the most common type and frequency of pathogenic gene variant among all cancers (73.2%), followed by CDKN2A (30.4%), CDKN2B (26.8%), KRAS (21.4%), MTAP (19.6%), APC (16.1%), and EGFR (16.1%). After TP53, PIK3CA and PTEN were the most common variants in breast cancer, and BRCA2 was the most common in prostate cancer. Treatment proposals based on CGP tests were possible in 46 cases, and the details of the treatments were as follows: enrollment in a clinical trial in 42 cases, including patient-proposed healthcare services in 2 cases, companion diagnostics in 3 cases, and insurance-covered drug administration in 1 case. However, only six cases were actually able to be treated. Secondary findings (suspected) were found in nine cases, including TP53 (four cases), BRCA2 (three cases), ATM (one case), and CHEK2 (one case). Only four patients underwent genetic counseling. In two cases, the results could not be explained due to a sudden change in the medical condition, and the examination fee could not be claimed. Future issues to address include ensuring the sample quality, considering the timing of the CGP test, and connecting cases with secondary findings (suspected) to genetic counseling.

Key words: cancer genomic profiling tests, cancer genomic medicine, cancer genomic medicine cooperative hospital, C-CAT, secondary germline findings