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The risk of anti-cancer drugs related cardiotoxicities in colorectal cancer patients following different anti-cancer drug treatments

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Objectives: Colorectal cancer (CRC) has been ranked second in terms of cancer incidence rate in Taiwan since 2008. Fortunately, the survival of CRC is much improved by increased screening and the development of newer anti-cancer drugs. However, with the increase in life expectancy, patients with CRC may be more likely to suffer the toxicities of anti-cancer drugs such as cardiotoxicity, which may be an important prognostic factor of CRC. According to previous studies, both fluoropyrimidines and targeted therapies are related to cardiotoxicities. However, little is known about the possible difference in cardiotoxicity between various anti-cancer drug treatments.

Methods: This is a hospital-based nested case-control study aimed at investigating the risk of cardiotoxicity in CRC patients after receiving different anti-cancer drugs. We employed the electronic medical charts and Cancer Registry of Taipei Veterans General Hospital (TVGH) to identify incident CRC patients admitted to TVGH between 2009 and 2013. Patients' medical records were reviewed by medical professionals to ascertain incident cases of cardiotoxicities who had received any of three different anti-cancer treatment regimens. Four controls were matched to each case on age (±2 years), gender and index date. The three anti-cancer regimens included fluoropyrimidine alone (arm A), fluoropyrimidine combined with platinum-based drugs (arm B) and fluoropyrimidine combined with both platinum-based drugs and targeted therapies (arm C). Conditional logistic regression was used in data analysis.

Results: A total of 89 cases and 356 matched controls were included. After controlling for potential confounders, CRC patients who received arm B treatment had a significantly higher risk of cardiotoxicity compared to patients receiving arm A treatment (OR 3.24; 95% CI 1.53-6.85). Among patients with stage I-III CRC, the adjusted ORs of cardiotoxicity were 2.46 (95% CI 1.19-5.09) and 3.43 (95% CI 1.29-9.13) for patients who received arm B and arm C treatment respectively, as compared to those patients receiving arm A treatment.

Conclusions: Patients with CRC who received fluoropyrimidines combined with oxaliplatin/ irinotecan had a higher risk of cardiotoxicity than patients receiving fluoropyrimidines alone. Moreover, among patients with stage I-III CRC, the receipt of fluoropyrimidines combined with oxaliplatin/ irinotecan and/or targeted therapies was also associated with a higher risk of cardiotoxicity. More frequent monitoring of possible cardiotoxicity may be warranted in CRC patients who receive combination chemotherapy.