Editorial

Statistical and epidemiologic models in gastrointestinal cancers analysis

Mohamad Amin Pourhoseingholi

Gastroenterology and Liver diseases Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Correspondence to: Dr. Mohamad Amin Pourhoseingholi, PhD. Gastroenterology and Liver diseases Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Email: amin_phg@yahoo.com.

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Cancer is known as one of the major causes leading to many disorders, death, and disabilities worldwide. Among all organ cancers, gastrointestinal (GI) cancers present an interesting pattern in distribution over the world. The epidemiology of cancer is the study of the factors affecting cancer, as a way to infer possible trends and causes. Statistical and epidemiological methods help us to find the cause of cancer and to identify and develop improved treatments. During the last two decades, epidemiology has undergone a rapid evolution toward collaborative research (1) and biostatistics is among the important scientific developments and growth in statistical methods for application to studies of medicine. Developments in likelihood methods for inference, epidemiologic statistics, clinical trials, survival analysis, and statistical genetics are beneficial for problems in public health, biomedical research and cancer studies.

Improved the ability to draw valid inferences from data is an important subject for researchers in the field of non-communicable diseases. Quantitative descriptions of non-communicable disease (including GI cancers) are essential inputs for burden of disease studies and cost-effectiveness analyses of interventions (2). Such models provide an important source of information for researchers and policy makers in field of cancer health. Besides, prediction is an important issue in oncology; innumerable decisions by patients, family members, oncologists, and other care providers depend on assessing the likelihood of future events (3). Some cancer researchers have argued that the negative results for some cancer clinical trials were due to lack sufficient statistical power (4). Despite of the model abuse, the validity of estimations are violated in the case of incomplete, unobserved or missing data. One way to incorporate these limited data into analysis is to use powerful statistical models which reduce the term of error. Statistical models are developed rapidly in new decades and predictions can provided much better to identify the pathways driving cancer progression.

In this special issue, entitled; Biostatistics and Epidemiology models in GI cancers, *Translational Gastrointestinal Cancer* (*TGC*) tried to revealed new studies of Biostatistics and Epidemiology models and its application in GI cancers. Ehsan Nazemalhosseini-Mojarad *et al*., in an Editorial paper, engaged with the prognostic value of tumor-infiltrating immune cells in patients with colorectal cancer. Validation of prognostic markers can be performed by data from a retrospective series of patients treated with standard cares. However, analysis of quality randomized clinical trials (RCTs) use for validation of predictive markers (5).

An original research by Pourhoseingholi, introduced a Bayesian model to analysis the death statistics of colorectal cancer, which subjects to misclassification. Misclassification is a major problem in epidemiological analysis, often leading to biased estimates, and can therefore cause one to underestimate health risks. This problem often happened in developing countries with low statistics registry and Bayesian model would be a cost-effective approach to overcome biases due to misclassification (6).

Rahimzadeh *et al*. applied cure rate model to analysis the stomach cancer survival. In typical survival analysis, it is proposed that all subjects are in expose to occurrence of death. However, practically, because of medical and early diagnose of cancers, a considerable percent of subject survive as the population survives. In this kind of data, according to the presence of people with long-term survival (cured), making use of cured models is proposed (7). Other problem in survival analysis is the competing risks, in which, the cause-

specific hazard rates are usually estimated by considering the independence assumption. However, this assumption may not be fulfilled in various practical situations. Asghari Jafarabadi *et al*. addressed the problem of independence assumption in the competing risks survival analysis by including frailty component in the model and showed the application in analysis of colorectal cancer patients' survival (8).

Yazdani-charati *et al*. employed geographical model to mapping GI cancer mortality. Geographical features and diets are among the factors which can influence the consequence of GI cancers and geographical model can recognize the high risk regions of GI cancer death in a proposed population (9).

Among GI cancers, colorectal cancer has the chances of better cure in individuals whom earlier detected and treated. Iravani *et al*. have been done a descriptive study to determine the results of a 2-year colorectal disease screening using colonoscopy (10). Also, the burden of colorectal cancer is in a rising trend in Asia-Pacific and in a review paper, the epidemiology and burden of this cancer in Asia-Pacific region were reviewed. There is little health authority support for colorectal cancer screening in Asian countries and the surveillance system in countries with high burden needed to provide facilities for screening (11).

Application of computer technology is a useful tool for managing and surveying of incidence, survival and mortality rate of cancers. Maserat *et al*., in their review paper, introduced virtual reality simulation electronic modeling technique to access more accurate, up to date and comprehensive information about burden, survival, mortality and incidence rate of GI cancers (12).

And the last, but not the least is Ashtari *et al*.'s paper which described how to measures the economic burden of GI cancer. The economic burden of GI cancer in the world is substantial and expected to increase significantly in the future due to expected growth of incidence rate. The rising cost of GI cancer treatment poses a significant challenge to health systems, government and private insurers, and individual patients (13).

I hope this special issue would provide insight for those researchers who interested in epidemiology of GI cancers and new statistical modeling in this field.

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