Molecular epidemiology

Molecular biomarkers in studies on environmental cancer

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Molecular cancer epidemiology studies search for molecular effects associated with the aetiological factors involved in environmental cancer

Biomarkers used for identification of risk factors of cancer in exposed populations have traditionally been classified into markers of exposure, effect, and susceptibility. Along with the advances in our knowledge about molecular biology, human genome, chemical carcinogenesis, and disease mechanisms, a variety of biomarkers of a more molecular nature have been launched and are currently being used widely in this field of research. This concept is often called, with some criticism, molecular epidemiology or molecular cancer epidemiology. As illustrated by Porta and coauthors in their present paper, there has indeed been a dramatic increase in number of publications in this interdisciplinary field of research over the past decade or so.

In their article, Porta and his colleagues deal with certain aspects of molecular biomarker studies of cancer, in particular those relevant to studies investigating somatic mutations of genes controlling cell growth and differentiation—such as DNA “fingerprints”—that is, indicators of the genotoxic nature of a chemical or exposure suspected of causal involvement. The authors themselves have performed several studies on K-ras mutations in pancreatic cancer, with outcomes suggesting associations between K-ras mutations and a number of environmental exposures or lifestyle factors. They have found that K-ras mutations in a series of exocrine pancreatic cancer cases show associations with tobacco and alcohol consumption, regular coffee drinking, serum organochlorine concentrations, and occupational exposure to solvents. In their paper, Porta and colleagues discuss another recent study on pancreas cancer and K-ras mutations that failed to observe association with serum levels of organochlorines or PCBs. The authors refer to a number of points that they view as limitations in the US study. These points may, however, be of interest in more general terms, too.

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REFERENCES


