AB030. S7-1. How to use large databases in research

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Abstract: Big data study has become an important biomedical research field, especially accompanying with the rapid development of artificial intelligence (AI). Compared with traditional clinical studies, including randomized clinical trials, case-control studies and cohort studies, big data research has the advantages with no selection bias, no un-response bias, no random error bias, and no loss of follow-up bias. In addition, big data research also has the advantages of data opening, sharing, and transparency, which allow scholars to re-check the accuracy of studies. With these advantages, big data provides an excellent opportunity to do clinical studies. In this talk, we will share big data research experiences focusing on digestive cancers' prevention and prediction. Taking stomach cancer for examples, we found Helicobacter pylori eradication and non-steroid anti-inflammatory drugs associated with reduced risk of stomach cancer and regular endoscopy screening within 5 years prior to stomach cancer diagnosis associated with reduced overall mortality. We also developed prediction scores for stomach cancer incidence. Taking hepatocellular carcinoma (HCC) for another example, we found antiviral therapy and aspirin were associated with lower risk of HCC, reduced HCC recurrence and overall mortality. We found metformin and statins associated with reduced risk of HCC risk and mortality. In addition, we confirmed the chemopreventive effects in cell lines and animal experiments. For hepatitis B patients receiving antiviral therapy, we developed a prediction score to examine the risk of HCC and validated our observations using Hong Kong population. Based on our previous research experience, we believe human diseases can be predicted precisely and prevented effectively by big data research. However, good study designs to reduce potential bias are essential in big data research.
Keywords: Big data research; artificial intelligence (AI); cancer risk prediction