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The impact of interval colorectal cancer on life expectancy and estimated life year loss in a nationwide-scaled 10-year cohort in Taiwan

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Background & Aims: The long-term outcomes of interval colorectal cancer (ICRC) varied in previous studies without accounting for lead time bias. This nationwide cohort analysis estimates expected years of life lost (EYLL) to adjust lead time bias and comparison between patients with ICRC and detectable colorectal cancer (DCRC).

Methods: Patients with colorectal cancer (CRC) registered in Taiwan Cancer Registry during 2002 to 2009 were enrolled, including 22,169 CRC confirmed within 6 months after colonoscopy grouped as detected CRC (DCRC) and 1,653 CRC diagnosed during 6-60 months after a negative colonoscopy grouped as ICRC. All patients were followed up until the end of 2011. We simulated age- and sex-matched referents from life tables in Taiwan National Vital Statistics using Monte Carlo method. Lifetime survival function of the cancer patients was obtained from extrapolation of logit transform of the survival ratio between cancer cohorts and age- and sex-matched referents. The LE (life expectancy) and EYLL were calculated after stratification by genders and tumor stages.

Results: Patients with ICRC had consistently shorter LE's than those of DCRC after stratification by genders and stages (male in stage 2: 12.8 vs. 15.2 years, $p < 0.001$; in stage 3: 6.6 vs. 11.0 years, $p < 0.001$; in stage 4: 2.2 vs. 3.9 years, $p < 0.001$ & female in stage 2: 14.1 vs. 17.5 years, $p < 0.001$; in stage 3: 13.6 vs. 15.3 years, $p < 0.001$; in stage 4: 2.2 vs. 3.7 years, $p < 0.001$). After adjustment for age at diagnosis and/or lead time bias, the EYLL was not different between ICRC and DCRC ($p > 0.05$). As compared to DCRC, ICRC had older age, more on proximal sites, and associated with previous endoscopic polypectomy procedures ($p < 0.001$).

Conclusion: The ICRC can lead into a shorter LE, but not EYLL after adjustment for lead time bias. Concerning ICRC predisposes to occur in the proximal colon and/or after endoscopic procedure, the assurance of colonoscopy quality and close surveillance to risky group shall be crucial to reduce ICRC and to thus possibly improve LE.

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