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Effect of the Look-back period for the estimation of the incidence rates using administrative data

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Introduction

Administrative data are widely used to estimate epidemiologic indicators. The look-back period is needed to define baseline population for the incidence. However, short look-back period is known to overestimate incidence of diseases misclassifying prevalent cases to incident cases. A short look-back period with longer observation period causes misclassification more inconsistent.

Objectives and Approach

The purpose of the study is to estimate the incidence rate of uterine leiomyoma by adjusting the misclassification error. We selected 319,608 women aged 15- 54 in 2002 from Korean National Health Insurance Service (KNHIS) cohort data. 34,445 cases were identified during 2002 - 2013. We applied 1-year look-back period as of 2003 and the actual look-back period increases with year, which incurs inconsistent misclassification error. Multiple regression model was used to estimate the number of incidence cases of the 11th look-back year for each year. Annual and adjusted annual incidence rates of uterine leiomyoma were calculated and compared.

Results

The annual number of patients(X_1) is linearly related with the number of misclassification cases, and the number of misclassification cases are logarithmically associated with the look-back periods(X_2). The regression equation was 0.07217 (y= 0.07217+ 0.00003213* X_1 + 0.07992*ln(X_2), R^2=94.3). Crude incidence rate of uterine leiomyoma during the study period was 11.7% (35,992 cases) and adjusted rate was 10.5% (32,477cases). The annual incidence and adjusted annual incidence increased by 2.29 times and 2.86 times between 2003 and 2013, respectively. With look-back period of 11 years, 4,588(53.8 %) patients with uterine leiomyoma were estimated to have prior history of the disease.

Conclusion/Implications

We proposed an adjustment for the misclassification error according to look-back periods. The method is applicable to estimate various healthcare events such as disease incidences and healthcare usage. Although the regression model showed very strong R-squared, follow-up study after several years is needed to validate the study results.