Evaluation of medical costs of kidney diseases and risk factors in Japan

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Abstract

Background

Kidney (renal) diseases and dialysis are among the most costly disorders and represent a worldwide burden. In Japan, 1.546 trillion yen or 3.8% of all medical expenditure were for renal diseases in 2014. In this study, we evaluate the medical costs for individuals with kidney disease and risk factors for such diseases.

Data and Methods

The dataset used contained 113,979 medical checkups and 3,172,066 medical cost records obtained from 48,022 individuals in one health insurance society. The sample period was April 2013 to March 2016. We evaluated the distribution of all medical costs, and those of kidney diseases specifically. Then the power transformation Tobit model was used to remove the effects of other variables. Finally, a probit analysis was used to analyze the factors that increased risk of kidney diseases.

Results: In 0.25% of all cases, individuals were diagnosed with kidney diseases and their medical costs were 3.5% of total medical costs. An individual with kidney disease cost 14.5 times more than those without kidney disease. If the diseases progressed into chronic kidney disease (CKD), the medical costs increased substantially. Even disregarding various characteristics, lifestyles, and medical histories of individuals, this conclusion did not vary. We found important risk factors included diabetes and blood pressure problems. In particular, an individual with both factors had a high probability of developing kidney disease.

Conclusion

Kidney diseases are much costlier than other diseases. Screening high-risk individuals, educating patients, and ensuring that treatment begins at an early stage are critically important to controlling medical costs.

Limitations

The dataset was observatory, and the sample period only 3 years.

Keywords: Kidney disease, medical costs, power transformation Tobit model