

Cost-effectiveness of Diagnosis By Ultrasound For Asymptomatic Thyroid Cancer In South Korea

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Introduction

Thyroid cancer can be detected in early stage using ultrasonography, but there are also questions about the necessity of screening tests due to its relatively high survival and low recurrence rate compared to other cancers. In this study, a cost-effectiveness analysis of thyroid cancer was conducted for better patient selection with cases diagnosed by ultrasound, as well as cases diagnosed through the presence of symptoms

Materials and methods

For the analysis, Markov decision chain model were used. The post-diagnosis process for patients followed the guidelines recommended by the Korean Thyroid Association. Recurrence rates and death rates were analyzed based on 25,000 patients from our institution. The cost calculations for diagnosis and treatment followed the regulations set by the South Korean Ministry of Health and Welfare. Deterministic and probabilistic sensitivity analyses were performed to account for uncertainty in the model's variables.

Table1. Model inputs for costs

Input	cost (Won)
Testing	
Thyroid screening U/S	146,243
Neck CT	116,440
PET-CT	637,070
Thyroid function test	59,230
* 0~5yr f/u cost per year	311,279
* 5~10yr f/u cost per year	132,352
Surgery	
1)Hemithyroidectomy	999,163
2)Total thyroidectomy with RAIT	2,482,462
Complication	
Short-term complication post-HT per year	2,563,319.03
Long-term complication post-HT per year	1,868,166.67
Recur(Complication post-TTLND) per year	2,204,354.23

Results

The average cost of diagnosis and treatment for patients diagnosed with asymptomatic thyroid cancer using ultrasound was ₩2,730,997 for 5 years and ₩3,970,652 for 10 years after diagnosis. In the case of patients diagnosed based on symptoms, the average cost was ₩3,970,652 for 5 years and ₩5,116,628 for 10 years. In sensitivity analysis, the cost range for patients diagnosed using ultrasound was ₩2,661,955 to ₩2,758,116, while for patients diagnosed based on symptoms, it ranged from ₩3,785,588 to ₩3,877,687 for 5 years. The maximum incremental cost was ₩1,215,732. A slight increase was observed in the maximum incremental cost between patients diagnosed using ultrasound and those diagnosed based on symptoms for 10 years, at ₩1,274,846 (₩3,901,609-₩4,025,078 for patients diagnosed using ultrasound and ₩5,060,500-₩5,176,455 for patients

Conclusions

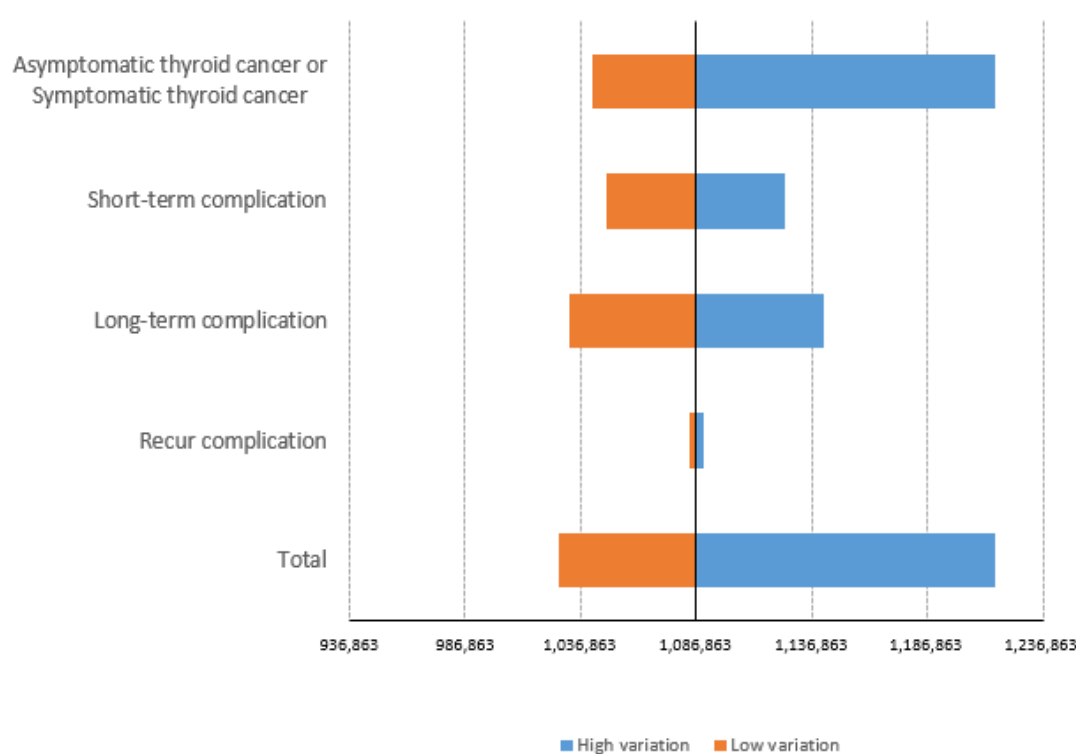
Diagnosis using ultrasound for asymptomatic thyroid cancer offers advantages in terms of cost-effectiveness when compared to symptom-based diagnosis in Korea. Cost-effectiveness can vary due to differences in the cost of diagnosis and treatment in each country, making it essential to establish an optimized thyroid screening strategy for a specific population.

Table2. Results

Follow-up time period	Group	Cost, ₩	Incremental cost, ₩
5-y	Screening	2,730,996.949	1,086,862.724
	Symptom	3,817,859.673	
10-y	Screening	3,970,651.573	1,145,976.126
	Symptom	5,116,627.699	

5 year

Incremental cost between symptom and health checkup



10 year

Incremental cost between symptom and health checkup

